Poster Presentations

Lab Quality Management and Methodology

Optimum Concentration of Sodium Hydroxide in Jaffe's Two-point Method for Serum Creatinine Measurement with Respect to Linearity Measurement as per Clinical & Laboratory Standards Institute EP-6A Guideline

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OBJECTIVE

Performing serum creatinine measurement linearity check as per Clinical & Laboratory Standards Institute (CLSI) EP-6A with 50, 150, 250, 350, and 450 mmol/L NaOH in final reagent mixture.

MATERIALS AND METHODS

Serum pool was prepared from leftover serum of samples. The reagents for creatinine measurement were prepared such that final reagent mixture has NaOH of 50, 150, 250, 350, and 450 mmol/L. A high-value serum was prepared by spiking serum pool with creatinine powder. An 11-point linearity check was done as per CLSI document EP-6A "Evaluation of the Linearity of Quantitative Measurement Procedures: A Statistical Approach; Approved Guideline".

RESULTS

The limit of linearity with 50, 150, 250, 350, and 450 mmol/L NaOH in final reagent mixture was 29.3, 30.95, 23.81, 23.97, and 30.95 mg/dL respectively. With increasing NaOH, there is increase in Y-intercept of the 1st order linearity, from –0.53 at 50 mmol/L NaOH to –1.6 mmol/L at 450 mmol/L NaOH.

CONCLUSION

Jaffe's two-point method exhibits greatest linearity of 30.95 mg/dL at final reagent concentration of 150 mmol/L NaOH when evaluated using procedure described in CLSI document EP-6A.

Biosensors and their Applications

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INTRODUCTION

A biosensor is an analytical device, used for the detection of an analyte, which combines a biological component with a physicochemical detector. The sensitive biological element (e.g. tissue, microorganisms, organelles, cell receptors, enzymes, antibodies, nucleic acids, etc.) is a biologically derived material or biomimetic component that interacts (binds or recognizes) with the analyte under study. The biologically sensitive elements can also be created by biological engineering. Biosensor reader devices with the associated electronics or signal processors are primarily responsible for the display of the results in a user-friendly way. This sometimes accounts for the most expensive part of the sensor device.

A biosensor typically consists of a bio-recognition component, bio-transducer component, and an electronic system, which includes a signal amplifier, processor, and display. Transducers and electronics can be combined, e.g. – CMOS-based microsensor systems. In a biosensor, the bioreceptor is designed to interact with the specific analyte of interest to produce an effect measurable by the transducer. High selectivity for the analyte among a matrix of other chemical or biological components is a key requirement of the bioreceptor.

Glucose monitoring in diabetes patients is a historical market driver. Other medical health- related targets. Environmental applications are, e.g., the detection of pesticides and river water contaminants, such as heavy metal ions. Remote sensing of airborne bacteria, e.g., in counter-bioterrorist activities is possible. Remote sensing of water quality in coastal waters by describing online different aspects of clam ethology (biological rhythms, growth rates, spawning, or death records) in groups of abandoned bivalves around the world can be performed.

Effect of Mean used for Calculation of Randox International Quality Assessment Scheme Target Score on Apparent Laboratory Performance for Serum Alkaline Phosphatase Examination

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OBJECTIVE

Objective of the study is to compare serum alkaline phosphatase (ALP) examination target scores (TSs) obtained using all method mean, method mean, and instrument mean for Randox International Quality Assessment Scheme (RIQAS) monthly clinical chemistry program.

MATERIALS AND METHODS

Serum ALP was measured every month in sample provided under RIQAS at the Biochemistry Laboratory New Civil Hospital, Surat, India. Results were submitted to RIQAS. The ALP TS reported by RIQAS is calculated using equipment mean. Using the RIQAS documentation on how to calculate TS, TS for all methods and TS for method in use were calculated using computer spreadsheet for 18 months.

RESULTS

The mean TS for 18 months of study reported by RIQAS was 38 based on equipment mean (Erba XL-640). As TS of < 40 is unsatisfactory performance, the RIQAS reported that the laboratory had unsatisfactory performance. Calculated mean TS using all method mean was 81, while calculated mean TS using method [pNPP 2-amino-2-methyl-1-propanol (AMP) buffer] mean was 103.

CONCLUSION

It was observed that there is a continuous low, unsatisfactory TS for ALP parameter in the RIQAS for the laboratory using equipment mean calculated from 10 laboratories using Erba XL-640. The laboratories using pNPP AMP buffer method were 200 in number. Very good TS (103) obtained using method mean shows that poor performance of laboratory reflected in RIQAS report was due to use of incorrect mean (i.e., equipment mean), while, in fact, the results of the laboratory reported actually were in good agreement with the 200 laboratories.

Are Sodium and Potassium Results on Arterial Blood Gas Analyzer Equivalent to those on Electrolyte Analyzer?

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OBJECTIVE

The present study was conducted with the aim to compare the sodium (Na) and potassium (K) results on arterial blood gas (ABG) and electrolyte analyzers, both of which use direct ion-selective electrode technology.

MATERIALS AND METHODS

This was a retrospective study in which data were collected for simultaneous ABG and serum electrolyte samples of a patient received in the biochemistry lab during February–May 2015. The ABG samples received in heparinized syringes were processed on Radiometer ABL 80 analyzer immediately. Electrolytes in serum sample were measured on ST 100 Sensacore analyzer after centrifugation. Data for 112 samples were collected and analyzed with the help of Excel 2010 and XLSTAT 2015 software.

RESULTS

The mean sodium in serum sample was 139.4 ± 8.2 meq/L compared with 137.8 ± 10.5 meq/L in ABG ($p < 0.05$). The mean difference between the results was 1.6 meq/L with a negative bias in ABG analyzer. Mean potassium in serum sample was 3.8 ± 0.9 meq/L as compared with 3.7 ± 0.9 meq/L in ABG sample ($p < 0.05$). The mean difference was 0.14 meq/L and ranged from –1.1 to 1.3 meq/L. Statistically significant difference was observed in results of two instruments in low Na (<135 meq/L) and normal K (3.5–5.2 meq/L) ranges.

CONCLUSION

The differences in electrolytes on the ABG and electrolyte analyzers fall within acceptable variability range as per Clinical Laboratory Improvement Amendments guidelines (4 meq/L and 0.5 meq/L for Na and K respectively). But the clinicians should be cautious in interpreting electrolyte results of ABG analyzer as unacceptable variations in sporadic samples may occur.

Accreditation: The Need of the Hour

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OBJECTIVE

Does accreditation really help to improve patient care?

MATERIALS AND METHODS

An analysis was done in the laboratory based on a questionnaire regarding various aspects of patient care. It was given both to the patients (number = 50) and the staff (number = 25) in the laboratory, which included turnaround time, waiting time, repeat sampling, reporting errors, etc.

RESULTS

There was increased patient satisfaction, which was reflected by reduced turnaround time, reduced waiting time, reduced repeat sampling, reduced reporting error, etc.

CONCLUSION

Accreditation is emerging as the preferred framework for building a quality medical laboratory. Accredited laboratories become more accountable and less dependable on external support. Efforts made to achieve accreditation may also lead to improvements in the laboratory. Thus, accreditation provides an effective mechanism for health system improvement yielding long-term benefits in the quality, cost effectiveness, and sustainability of health system.

Comparative Evaluation of Two Different Protocols for Derivation of Mean and Standard Deviation of Internal Quality Control Sera

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INTRODUCTION

As a part of internal quality assessment, it is a usual practice in clinical chemistry laboratories to run internal quality control (IQC) sera and check the results for any violation of Westgard rules. A mean and standard deviation (SD) of a minimum 20 values of IQC results is taken for plotting the Levey-Jennings (LJ) chart, but results of extended period (60–90 days) can also be used to calculate mean and SD.

OBJECTIVE

To derive mean and SD of IQC results for a period of 20 and 90 days, to monitor daily IQC results for violation of Westgard rules using mean and SD of 20 and 90 days, and compare frequency of violation of Westgard rules and external quality assurance services (EQAS) performance while using these two means and SDs.

METHODOLOGY

This study was conducted in the Clinical Chemistry Laboratory of Medical College and Shree Sayaji General Hospital, Vadodara, India, where two levels of IQC sera are run twice daily. When a new lot of IQC sera was put into use, means and SDs were derived using 20 days (Protocol-A) and 90 days (Protocol-B) results. Both were used for daily monitoring of IQC for 3 months. We compared frequency of violation of Westgard rules (1_{3s}, 2_{2s}, R_{4s}, 10×) and EQAS Standard Deviation Index (SDI) for 3 parameters – plasma glucose, serum alanine aminotransferase (ALT), and serum creatinine, while using these two protocols.

OBSERVATIONS

The Westgard rules were violated for a total of 14 times while using Protocol-A as compared with only 2 times while Protocol-B was used. No significant difference was found in EQAS results in terms of SDI.

CONCLUSION

From the current study, it is concluded that for IQC daily monitoring, if mean and SD are derived from longer period (90 days) results of IQC sera, there are fewer incidences of violations of Westgard rules without any compromising effect on EQAS results. Hence, by using more number of values over a longer period, one can reduce unnecessary rejections of run, re-run of IQC, and repeated calibration of test parameters, thereby, reducing the overall cost of testing and improving the turn-around time.

Patient Risk Management in Clinical Laboratory

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OBJECTIVE

Risk management is the systematic application of policies, procedures, and practices to the tasks of analyzing, evaluating, controlling, and monitoring risk. Clinical laboratories conduct a number of activities that could be considered as risk management including verification of performance of new tests and troubleshooting instrument problems. The concept of moving from one-size-fits-all quality control (QC) to right QC was introduced in a memorandum from the Director of the Survey and Certification Group to State Survey Agency Directors titled "Initial Plans and Policy Implementation for Clinical and Laboratory Standards Institute (CLSI) Evaluation Protocol-23 (EP), Laboratory Quality Control Based on Risk Management, as Clinical Laboratory Improvement (CLIA) (QC) Policy." The new QC protocol will not necessarily reduce QC requirements, but instead, will be the "right" QC for the clinical laboratory.

MATERIALS AND METHODS

Development of a quality control plan for a laboratory testing process with consideration for steps in the preanalytic, analytic, and postanalytic phases of testing.

RESULTS

Simple guidelines for choosing the number of QC samples to run and appropriate quality control rules based on sigma values as per Dr Westgard rules.

CONCLUSION

Control processes that either prevent or improve the detection of errors can be implemented at these weak points in the testing process to enhance the overall quality of the test result.

Study of Variation in Serum Electrolyte Values over a Period of Time

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OBJECTIVE

To evaluate the variation in serum electrolyte (Na and K) levels due to delayed sample analysis.

MATERIALS AND METHODS

We analyzed 152 samples for serum electrolytes collected from different wards. The samples were received by the lab within 1 hour of sample collection. The samples were immediately analyzed after centrifugation and values recorded. The samples were kept in the lab uncovered as per the usual practice, with controlled environmental temperature conditions and were estimated twice after a gap of 2 hours each, i.e., at 3 and 5 hours post sample collection. All the samples were analyzed on the same instrument using Beckman AU400 analyzer on ISE mode.

RESULTS

Results were compared using repeated measure ANOVA, which showed statistical difference $p < 0.05$ between 1st and 2nd and 2nd and 3rd measurements. There is a statistically significant rise in values of Na and K over a period of time.

CONCLUSION

Evaporation of sample could be the major cause leading to sample concentration resulting in high values. Simple measures like early analysis of samples or covering the samples properly will prevent such erroneous results.

Indices of Glucose Homeostasis in Cord Blood of Term and Preterm Newborns

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OBJECTIVE

This study was planned with an objective to determine the early alteration in indices of glucose homeostasis in cord blood of term and preterm newborns and correlation of glucose, insulin, and cortisol with insulin resistance indices.

MATERIALS AND METHODS

A descriptive study comprising 35 term and 35 preterm newborns was carried out from December 2013 to June 2014. Venous cord blood was collected and plasma glucose was analyzed by glucose oxidase – peroxidase method in auto analyzer, whereas serum insulin and cortisol were analyzed by enzyme-linked immunosorbent assay. The homeostatic model assessment (HOMA2-IR index), quantitative insulin sensitivity check index, and glucose insulin ratio were measured to assess insulin resistance. The data on physical and metabolic parameters were analyzed using parametric statistical significance tests for means and Pearson's correlation coefficient using R package.

RESULTS

In term newborns, mean glucose and cortisol levels (83.6 ± 17.4 mg/dL and 118.8 ± 57.8 ng/mL respectively) were significantly higher than preterm glucose and cortisol levels (70.4 ± 15.8 mg/dL and 89 ± 46.6 ng/mL respectively). Insulin and HOMA2-IR levels were found higher in preterm newborns (10.8 ± 4.8 µIU/mL and 1.2 ± 0.57 respectively) than in term newborns (7.9 ± 2.7 µIU/mL and 0.97 ± 0.29 respectively). Insulin was found positively correlated with HOMA2-IR, whereas cortisol was found negatively correlated with HOMA2-IR in both term and preterm newborns.

CONCLUSION

Higher insulin and HOMA2-IR in preterm newborns at birth imitate the positive correlation of gaining weight and insulin resistance in later life.

Comparative Study of Serum Electrolytes Levels on Arterial Blood Gas and Ion Selective Electrode Analyzer

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INTRODUCTION

Accurate electrolyte estimation is crucial for management of critically ill patients and also for anesthetic fitness. The analysis can be performed on standalone ion selective electrode (ISE) analyzers or on arterial blood gas (ABG) analyzers. The ABG analyzers use heparinized syringe, whereas heparin or plain vacutainers are used on standalone ISE analyzer. There is general apprehension among clinicians that electrolytes estimated on ABG analyzers are not reliable, as the sample gets diluted with liquid heparin. With this background, we conducted a study with the following objective.

OBJECTIVE

To compare serum electrolyte levels on ABG and ISE analyzers respectively.

MATERIALS AND METHODS

Samples were collected simultaneously both in heparinized syringe and Li heparin vacutainers (Green top), and were estimated within 10 minutes on ABG analyzer and standalone ISE analyzers respectively. In all, 90 samples were analyzed.

RESULTS

There was no satisfactory significant difference between the analyses done on both the instruments.

CONCLUSION

It is concluded that serum electrolyte estimation on ABG analyzer gives the same results as that of ISE analyzer, and the container of sample collection which is heparinized syringe or heparinized vacutainer, does not alter the end result.

Serum Calcium, Phosphorus, Alkaline Phosphatase, and Glucose Levels in Tuberculosis Patients

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OBJECTIVE

To estimate levels of serum calcium (S.Ca), serum phosphorus (S.Ph), serum alkaline phosphatase (SAP), and blood glucose (Glu) in tuberculosis patients. Correlation between ratio of calcium and phosphorus levels with blood sugar and SAP was also sought for.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Biochemistry, Post Graduate Institute of Medical Sciences, Rohtak, India including 25 indoor patients of tuberculosis as cases and 25 age- and sex-matched controls. Cases were on CAT-1 treatment. Patients on other treatment categories were excluded. About 5 mL fasting blood sample was collected, and after serum separation, used for analysis of S.Ca, S.Ph, SAP, and Glu on Randox Suzuka autoanalyzer.

RESULTS

The mean value for S.Ca in cases and controls group was 8.93 ± 1.39 and 10.40 ± 0.78 mg/dL. Lower levels of blood glucose were seen in cases (mean 64.52 ± 33.43 mg/dL) than controls (mean 97.00 ± 13.49 mg/dL). Ratio of calcium/phosphorus ≤ 1 was significantly correlated with low glucose levels. Significant high levels of SAP were observed in cases group (p-value < 0.001). Mean SAP of cases and controls were 142 ± 25.07 and 72.56 ± 19.12. Positive correlation was found between SAP and glucose levels, and increase in SAP levels indicated lower glucose levels.

CONCLUSION

Tuberculosis patients have a higher SAP levels, lower S.Ca, and lower calcium/phosphorus ratio, which correlates with low glucose levels.

Turnaround Time for Liver Function Tests in a Tertiary Care Center

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AIMS AND OBJECTIVES

Evaluation of turnaround (TAT) time of routine biochemical parameter, record cases with higher TAT and analyze its causes, and suggest measures to reduce TAT to ensure laboratory quality.

MATERIALS AND METHODS

Cross-sectional study was conducted in a tertiary care centre. Liver function test of 200 samples, which were advised by the consultants from the outpatient department, was observed for TAT for the study. Samples were received from 8.30 am to 12.30 pm. Liver function test including total bilirubin, serum glutamic oxaloacetic transaminase, serum glutamic-pyruvic transaminase, and alkaline phosphatase were performed. Sample analysis was done on fully automated analyzer XL-640. The TAT was measured for preanalytical, analytical, and postanalytical phases.

RESULTS

The TAT was subdivided into preanalytical, analytical, and postanalytical phases on the basis of 4 time points when data were entered into the LIS. Total TAT was calculated as the algebraic sum of the time taken at every step from test ordering to reporting

of results. It was observed that the intralaboratory median TAT for liver function tests was 4 hours. About 72% of samples were reported within 4 hours. Therefore, any test reported after 4 hrs was taken into account as delayed TAT. The preanalytical phase delays were primarily responsible for increased TAT.

CONCLUSION

Clinicians consider TAT from the time the test is ordered to results reporting, whereas laboratory professionals usually use specimen receipt to reporting of results as the TAT. Monitoring of all the steps from test ordering with the causes of delayed TAT should be done, and causes for delayed TAT should be identified with steps taken to improve the process.

Role of Quality Control in a Clinical Laboratory

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AIM

To study the importance of quality control in a clinical laboratory.

BACKGROUND

Quality control (QC) is the most important tool to ensure both precision and accuracy of patient reports in a clinical laboratory testing and, hence, its reputation. When QC works effectively, it can identify and rectify the source of error in the analytical processes of a laboratory timely, before potentially incorrect results are released. In a clinical laboratory, many sources of errors can affect patient results, which include clerical errors, technical errors, calibration error, reagents instability, and random errors. So, it is very difficult to detect the source of error without an effective QC Protocol.

IMPORTANT TOOLS OF QC PROGRAMS

The QC materials that must be of similar matrix and tested identically to patient samples. Levey-Jennings (L-J) charts and Westgard Rules: These are the most effective tools used to track laboratory QC results. Implementing Westgard rules within an L-J chart can identify violation of the rules based on control limits established for the sample tested. These can easily identify the type of error in a quality control run. Clinical Experience: Most practically, even by simply tracking of the running averages of the patient results, an experienced biochemist can identify drift or problems with analyzer function.

CONCLUSION

Addressing QC issues is critical to identification and rectification of potential sources of errors. It is important to ensure accuracy of patient results and establish the reputation of every clinical laboratory.

Professionalism in Laboratory Medicine

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INTRODUCTION

Laboratory medicine is both a science and an art. Traditionally, medical men and women are supposed to keep the good of the patients above their own good. Such altruism is evident in the Hippocratic Oath too. Nevertheless, taking appropriate remuneration for their services has also been identified as their right. The word appropriate means a lot here. Today, lack of proper health education has led to channeling of the majority of patients to only a handful of specialists. The rest of the lot has to either immigrate outside the country or resort to merciless commercialization of health care. The resulting menaces like commissioning by clinical labs start a vicious cycle of converting health care into an art of war with little element of science left in it. Also, in teaching institutes of high standards in India, there is lack of honest acceptance of healthy criticism among peers. One such dictum that prevails is that of "Publish or Perish". With hundreds of thousands of scientific papers being published every year, it is hard to decide on their credibility and importance. Another important point in today's scenario is the double-edged sword, i.e., automation. With the highly sophisticated instrumentation come accuracy and faster results. But, are we not producing highly skilled technicians as our postgraduates? With so much effort required to master the robotics and specialized computerization that these autoanalyzers involve, are not clinical chemistry basics being forgotten?

Analytical Sensitivity of Thyroid-stimulating Hormone Assays by Enzyme-linked immunosorbent Assay and Enzyme-linked Fluorescent Assay

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INTRODUCTION

Thyroid stimulating hormone (TSH) levels have been assayed in the serum of 105 patients by both enzyme linked immunosorbent assay (ELISA) and enzyme linked fluorescent assay (ELFA), so as to analyze the performance of the above two technologies. The study also aims at detecting the analytical sensitivity of both ELISA and ELFA. Analytical sensitivity refers to minimal concentration of TSH that can be detected by a given assay with greater confidence.

OBJECTIVE

The objective of this study is to compare the performance of TSH assay based on ELFA with ELISA technology and also compare the analytical sensitivities of the TSH assay by the above two technologies.

MATERIALS AND METHODS

Blood samples were collected from 105 children visiting the endocrinology outpatient department, Institute of Child Health, Egmore, India. Newborn babies and children with acute illness were excluded. Serum is aliquoted in two fresh microcentrifuge tubes – one for ELISA and the other for ELFA TSH Assays.

RESULTS

Out of 105 individuals, ELISA identifies 66 children to be euthyroid, 12 as hyperthyroid, and 27 children as being hypothyroid. The ELFA identifies only 63 as euthyroid, 10 as hyperthyroid, and 32 as hypothyroid. There is statistically significant difference between ELISA and ELFA in euthyroid ($p < 0.001$) and hypothyroid ($p < 0.05$) individuals. The precision coefficient of variation (CV) of TSH assay by ELFA technology is better compared with that of ELISA.

CONCLUSION

The TSH assay by ELFA technology can easily be automated, is reliable, and also highly efficient as compared with ELISA. The ELFA technology can detect TSH levels as low as 0.05 µIU/mL. Assay of TSH based on fluorescent signal has higher precision and analytical sensitivity as well as broader functional range compared with assay of TSH by enzymatic signals.

Utility of Transcutaneous Bilirubinometer in Preterm Neonates in a Tertiary Care Hospital

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OBJECTIVE

The aim of this prospective study was to evaluate the accuracy and precision of transcutaneous bilirubinometry in preterm newborns and identify the most appropriate measurement site.

MATERIALS AND METHODS

Transcutaneous bilirubin (TcB) measurements were performed over forehead and sternum, if total serum bilirubin (TSB) had to be determined on clinical indication in neonates with gestational age 28 to 37 weeks. The TSB levels were measured in a clinical laboratory using Modified Jendrassik–Grof photometric method and analysis of data was done using suitable statistical tools.

RESULTS

Among 100 paired TcB/TSB measurements, 56 were male and 44 were female. The mean gestational age was 33 week and mean birth weight was 1818 ± 50 g. The overall bilirubin concentration ranged from 5.5 to 17.1 mg/dL (mean = 9.6 mg/dL) for TSB and from 4.7 to 17.2 mg/dL (mean = 9.9 mg/dL) and 4.2 to 16.5 mg/dL (8.5 mg/dL) for frontal and sternal TcB respectively. Overall, preterm infants had significant correlation of TSB and TcB ($r = 0.62$, $p < 0.001$) with TcB on forehead being more accurate ($r = 0.86$, mean difference, 0.3 ± 1.9 mg/dL) than TcB on sternum ($r = 0.74$, mean difference, 1.5 ± 2.6 mg/dL).

CONCLUSION

The TcB correlates significantly with TSB in preterm neonates with more precision on forehead measurement. Transcutaneous bilirubinometry has the potential to reduce the number of blood samplings thus, reducing neonatal pain and discomfort, parental distress, and medical care costs.

An Optimized, Cost-effective, and Efficient Laboratory Protocol for Erythrocyte Membrane Protein Extraction and Quantification for Proteomic Studies

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INTRODUCTION

Erythrocyte membrane is the easiest obtainable source for study of cell membrane chemistry and physiology in animal samples. Lot of literatures is available from various sources depicting different protocols for this purpose. Most of them use very high-end instruments, such as ultracentrifuges and/or costly consumables like cell filters. The protocols using simple centrifugation methods have not been documented to be optimally efficient. Various buffers have been documented to be used for this purpose with variable efficiencies. This study aims at developing a simple, less costly, and efficient method for the isolation of erythrocyte membrane protein.

MATERIALS AND METHODS

A 2 mL of fresh blood sample is collected in ethylenediaminetetraacetic acid tubes. The sample is first separated by simple centrifugation method and buffy coat is removed. An isotonic buffer containing TRIS-HCl and NaCl is used to wash the pellets. Density gradient separation is used to further purify the red blood cells (RBCs) from contamination of other cells [(mostly white blood cells (WBCs)]. The RBC ghost was prepared by using lysis buffer containing TRIS (pH-7.4). Membrane proteins are solubilized using a simple solution of sodium dodecyl sulfate, and the protein quantification was done by a modified Bradford's method. Only a simple laboratory centrifuge was used for all the centrifugation purposes (maximum force = 15000 g).

RESULTS

The RBC:WBC ratio was quite at par with very sophisticated procedures (~10^6:1). The concentration of membrane protein was in the order of 200–500 µg/mL, which is an encouraging yield.

CONCLUSION

This study has helped to optimize erythrocyte membrane protein extraction, and the protocol can be performed with minimal requirements, expenditure, and efforts. This can help in augmenting the studies on membrane structure and function.

Comparison of Electrolytes by Blood Gas Analyzer and Laboratory Autoanalyzer

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OBJECTIVE

Electrolyte values form a core panel of investigation in sick patients. Early availability of electrolyte levels helps in taking swift action for fluid/electrolyte imbalances. Electrolyte values may be obtained by blood gas analyzer as well as laboratory autoanalyzers. Blood gas analyzer gives electrolyte levels instantly, whereas lab autoanalyzers provide values after significant time gap. This study aims to compare electrolyte values of paired samples through blood gas analyzer and lab autoanalyzer.

MATERIALS AND METHODS

Paired samples of sick patients were sent for blood gas analysis/electrolytes by blood gas analyzer, and another sample sent for electrolytes analysis by lab autoanalyzer. The electrolytes levels thus, obtained were analyzed to assess whether there is any statistically significant difference between electrolyte values obtained through different analyzers.

RESULTS

Total of 75 samples were analyzed. Mean arterial blood gas (ABG) sodium value was 139.3, and by mean AA sodium value was 144.2 Mean ABG potassium value was 3.74, while mean AA potassium value was 3.85.

CONCLUSION

It may be concluded that potassium values by ABG correlate well with AA values and thus, may be relied upon for taking early action in critical situations. Whereas, sodium values by ABG and AA show statistically significant difference.

Liquid Biopsy: A Recent Breakthrough in Cancer Genome Study

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INTRODUCTION

In the current era of targeted treatment in cancer, the genetic study of tumor is required to decide the customized therapeutic agent. As today, clinicians depend on genetic study in the tissue biopsy specimen. However, the tumor genome is very unstable and is prone to change under selection pressure; the genetic study by repeated tissue biopsy is cumbersome and impractical. Liquid biopsy is a new breakthrough to overcome this problem. Circulating tumor cells and deoxyribonucleic acid (DNA) shed from primary and metastatic cancer are used for noninvasive analysis of tumor genome during treatment and disease progression. Various techniques used for liquid biopsy are microfluidic techniques, microarray, DNA protein chip, epispot, quantitative immunofluorescence, next generation sequencing, multiple annealing and looping-based amplification cycles, etc.

Sigma Approach to Improve on Quality Indicators in a Clinical Biochemistry Laboratory

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INTRODUCTION

In a biochemistry laboratory, the use of quality indicators is a scope and guiding tool in the improvement of quality performance. The objective of the study is to improve the laboratory performance using appropriate sigma tools. The biochemistry section has identified the preanalytical quality indicators, and using sigma tools has monitored and improved its quality goals. Using basic sigma tools, such as Fishbone analysis and failure mode and effect analysis, the laboratory introduced a number of changes in the laboratory protocol, and this led to a significant improvement in the rates of the indicators. It can be concluded that the sigma application in initiating, monitoring, and implementing quality indicators is instrumental in the improvement of the laboratory's scenario. Audits and feedback based on the indicator data can be effective in upgrading the quality of the laboratory's performance.

Monitoring of Turnaround Time in Biochemistry Lab in a Tertiary Care Hospital in Punjab

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OBJECTIVE

Quality assurance has been an essential part of clinical laboratory operations for more than two decades. For a laboratory test to be useful, it must be available in a timely manner.

MATERIALS AND METHODS

The turnaround time (TAT) was evaluated in 300 samples received in the biochemistry lab, out of which 150 were received from outdoor and 150 from indoor patients.

RESULTS

The average TAT for tests received from outdoor and indoor patients was 163.9 ± 35.8 minutes and 162.4 ± 52.6 minutes respectively. The analytical time for both outpatient department (OPD) (79.2 ± 22.4) and inpatient department (IPD) patients (77.4 ± 32.4) minutes was significantly less in OPD ($p = 0.027$) as well as in IPD ($p = 0.047$) than the combined pre and postanalytical time in both OPD (84.6 ± 24.1) and IPD patients (84.6 ± 35.0) minutes. The intralaboratory TAT was calculated by taking 75 percentile as

the optimum cutoff value. It was observed that 28 out of 150 samples in the OPD and 37 out of 150 samples in IPD were reported outside the cutoff value.

CONCLUSION

The (TAT) can be reduced by decreasing both the preanalytical and the postanalytical time. The TAT can also be reduced by training all the clinicians and nursing staff to see the report on the hospital information management system rather than waiting for the manual report.

Effect of Blood Storage on Complete Biochemistry

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INTRODUCTION

Prolonged storage of blood leads to alteration in red blood cells' (RBCs) biochemistry, which may lose viability with time. This study was planned to observe biochemical changes in stored blood for 19 different analytes.

MATERIALS AND METHODS

The study was conducted on blood donated by 30 healthy volunteer donors. Effect of storage was analyzed at 0, 3, 7, 14, and 21 days interval. Biochemical parameters were measured using Randox Suzuka autoanalyzer and Combiline ion selective electrode analyzer.

RESULTS

Significant changes were observed in serum phosphorus, serum glutamic oxaloacetic transaminase, serum protein, lactate dehydrogenase, pH, serum chloride, ionized calcium, serum sodium, potassium and bicarbonate levels ($p < 0.05$ for ionized calcium, serum protein, and $p < 0.001$ for rest of the parameters). On the other hand, there was no impact of storage time on rest of the parameters.

CONCLUSION

Prolonged contact of plasma with RBCs results in exchange of contents between plasma and RBCs, which leads to changes in analyte concentrations as well as dilution. The RBCs stored for a period of time at 4°C lose viability. Some may undergo spontaneous hemolysis while in storage; others lose the ability to survive in the recipient's circulation following transfusion. Despite storing blood with citrate phosphate dextrose adenine solution, the storage time has a negative impact on the biochemical composition of RBCs. Therefore, it is better to give patient's fresh blood with less than 7 days of storage in order to decrease the levels of nonviable RBCs.

The Contribution of Lyzed Red Blood Cells to the Electrolyte Status of Serum

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OBJECTIVE

Hemolysis is a common reason for aberrant electrolyte readings in the serum. In the present study, we explored the extent of possible aberrations and its relationship to the extent of hemolysis.

MATERIALS AND METHODS

Blood was collected in heparinized vial and red blood cell (RBC) count measured by a cell counter. Blood was washed twice using isotonic sucrose solution and then centrifuged. Isotonic sucrose was added to the RBC pellet, and volume was made up to 10 times the original volume and then mixed gently. Different volumes of this constituted RBC suspension were aliquoted in different tubes, and the final volume was made up to 2 mL using fresh pooled serum. The tubes were frozen at –20°C, then vertexed, and the process was repeated twice to ensure complete hemolysis. Tubes were centrifuged and the absorbance was measured at 490 nm. Electrolyte analysis was done with all the samples and the data compared.

RESULTS

After an initial dip of around 7.5% at absorbance 1.22, the value of sodium by and large remains stable up to 7.2% at an absorbance of 2.00. The value of potassium went up from 3.4% at absorbance 1.22 to 17% at 2.00. The ionized calcium values changed from 14% at 1.22 absorbance to 15.6% at absorbance 2.00. The chloride varied from 3% at 1.22 to 6% at 2.00.

CONCLUSION

Our study shows that under conditions where a repeat sample could not be available, one may proceed with estimation of electrolytes than a hemolyzed sample as long as the extent of degree of hemolysis did not go higher than 1.22, provided we are aware at the extent of likely errors.

Influence of Hemolysis and its Intensity on Several Biochemical Analytes

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INTRODUCTION

Hemolysis is an often encountered problem in the clinical biochemistry laboratory, often leading to wastage of samples. In the present study, we explore the influence of hemolysis on different biochemical analytes.

MATERIALS AND METHODS

Blood sample was collected in a heparinized vial and the red blood cell (RBC) count estimated. This sample was washed twice with isotonic sucrose solution and the volume made up to 10 times the original volume of blood. The sample was gently mixed. Different quantities of RBCs were added to multiple aliquots of pooled serum. The samples were deep frozen twice followed by vortexing to ensure hemolysis. Absorbance was measured at 490 nm in all the tubes to assess the quantity of hemoglobin. Different biochemical analytes were estimated in all the tubes and data were calculated and interpreted.

RESULTS

The influence of hemolysis and its extent were different on different parameters. The value of glucose decreased by an extent of around 13%, irrespective of the extent of hemolysis. The value of urea decreased by an extent of around 27% irrespective of the extent of hemolysis. The value of creatinine decreased by an extent of around 33% irrespective of the extent of hemolysis. The value of alanine transaminase decreased by an extent of around 21% irrespective of the extent of hemolysis. The value of aspartate transaminase (AST) remains stable up to an absorbance of 1.22 and then subsequently increased proportionate to the absorbance.

CONCLUSION

In case of emergency and nonavailability of repeat samples, all the parameters discussed above may be interpreted with appropriate corrections. The AST values, however, can be given as such up to an absorbance of 1.22.

Influence of Hemolysis and its Intensity on Thyroid Hormone Estimation

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INTRODUCTION

Hemolysis is an often encountered problem in the clinical biochemistry laboratory, often leading to wastage of samples. In the present study, we explore the influence of hemolysis on thyroid hormone analysis.

MATERIALS AND METHODS

Blood sample was collected in a heparinized vial, and the red blood cell (RBC) count estimated. This sample was washed twice with isotonic sucrose solution and the volume made up to the 10 times the original volume of blood. The sample was gently mixed. Different quantities of RBCs were added to multiple aliquots of pooled serum. The samples were deep frozen twice followed by vortexing to ensure hemolysis. Absorbance was measured at 490 nm in all the tubes to assess the quantity of hemoglobin (Hb). Thyroid hormones were estimated in all the tubes, and the data were calculated and interpreted.

RESULTS

The influence of hemolysis and its extent were different for different parameters. The T3 values were unaltered up to a hemoglobin absorbance of 1.52. The T4 values were highly sensitive to hemolysis at absorbance of Hb. The same applies to FT3 and FT4. The thyroid stimulating hormone (TSH) values remain practically unaffected up to the hemoglobin absorbance of 1.05.

CONCLUSION

Our experiments show that T3 is unaffected by hemolysis, and TSH remains unaffected by hemolysis up to the hemoglobin absorbance of 1.05. Thus, we conclude that hemolyzed sample meant for thyroid hormone analysis can be used under emergency conditions only for the estimation of T3 and TSH.

Comparison of Melt Curve Profile of Deoxyribonucleic Acid Intercalating Dyes Used for Real-time Polymerase Chain Reaction

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OBJECTIVE

Real-time polymerase chain reaction (PCR) and melting curve profiling are the techniques used for quantifying nucleic acids, expression analysis, and genotyping. Utilization of real-time PCR continues to expand, and many different systems have been developed. These include a more specific, but costlier probe-based methods (Taqman probe) and less specific, but cheaper deoxyribonucleic acid (DNA) intercalating dyes that bind to double-stranded DNA (Syto9, Eva Green and LC Greenetc). These DNA-binding dyes probably affect the T_m (melting temperature in °C), which is an important determinant of deciding annealing temperature for the PCR reaction. In this study, we have compared the effect of these dyes on the T_m of the PCR product through melt curve analysis.

MATERIALS AND METHODS

The DNA extraction was done using Quick-gDNA™ MiniPrep kit. A 0.1 µg of DNA was amplified using specific primers and a PCR mix. Three separate sets were used each with a different dye (Syto9, Eva Green, and LC Green) for melt curve analysis.

RESULTS

Melt curve analyses showed that the T_m for the PCR product was different for various dyes [Syto9 (86.57 ± 0.12), Eva Green (86.60 ± 0.17), and LC Green (88.20 ± 0.00)]. It was lower for Syto9 and Eva Green when compared with LC green.

CONCLUSION

The DNA-binding dyes (Syto9, Eva Green, and LC Green) affect the T_m of the PCR product and are most likely to have a similar effect on the annealing temperature of the primer. Our study indicates that similar annealing temperatures will work for Syto9 and Eva Green, but a higher temperature will be required if we are using LC Green.

Comparison of Effect of Ramp Rate on Polymerase Chain Reaction Amplification by Melt Curve Analysis

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OBJECTIVE

The performances of thermal cyclers for polymerase chain reactions (PCRs) are of great concern in terms of reliability and interinstrument repeatability of PCR-based assays. The amplification may be affected by factors, such as ramp rate, actual block temperature, etc. This study aims to explore the interinstrument reproducibility of PCR-based assays for instruments having different ramp rates.

MATERIALS AND METHODS

One common protocol was used for PCR amplification simultaneously on four different thermal cyclers with different ramp rates. The PCR products from various instruments were identified and compared by melt curve analysis.

RESULTS

It was observed during melt curve analysis that dF/dT (rate of change of fluorescence with temperature) was variable between the different PCR products from different thermal cyclers. The maximum dF/dT was obtained for PCR product from thermal cycler with lowest ramp rate. It decreased with increase in ramp rate. The dF/dT for PCR product from thermal cycler with highest ramp rate was negligible. The findings were confirmed by gel electrophoresis.

CONCLUSION

When rapid cycling conditions are applied to small-volume reactions, the results may vary according to rate of change in temperature during cycling. The temperature of reaction mixture may not be the same as block temperature, and, therefore, time available for the reaction to proceed would vary with rate of change of block temperature. Thus, care should be taken while comparing products from different thermal cyclers and while shifting experiments from one thermal cycler to another.

The "Power" of a Study

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INTRODUCTION

Research studies involve collecting some data and then calculating the probability (p) of observing data at least as extreme as our data, given that no effect exists in the population. If p is smaller than α (usually 0.05), the findings are claimed to be "statistically significant."

A study may not show a significant difference between groups, if

- There was really no significant difference.
- There was a difference, but the study failed to detect it (false negative result). This may be due to the poor design of the study or "lack of power."

The power of a study is its ability to detect a difference, if the difference really exists. Stated in a different way, it is the probability of correctly rejecting a false null hypothesis. A Type II error is a failure to do this. The probability of committing Type II error is β and (1-– β) is the statistical power of a test.

Statistical power is affected by three factors: Sample size, effect size, and α (or significance) level. Sample size is the most important factor in the sense that there is little room to change α, since it is conventionally fixed at 0.05 or 0.01. Also, it is difficult to control effect sizes in many cases.

A statistical power analysis is either prospective or retrospective. A prospective analysis is often used to determine a required sample size to achieve target statistical power (usually 0.8); whereas, a retrospective analysis determines the statistical power of a test given sample size and effect size.

A Walk through the Clinical Diagnostic Laboratory – Past, Present, and Future – A Career's Experience

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OBJECTIVE

Medical biochemistry, as it stands today, is a complexity of many sciences and includes a large amount of mathematics and statistics, a complex subject with abundance of knowledge through the years. To accept it more than a job turns it into passion.

MATERIALS AND METHODS

Adapting changes from ordinary colorimetric and semiautomated clinical chemistry analyzers, from flame photometry to electrolyte and arterial blood gas machines, from enzyme-linked immunosorbent assay to automated immunoassay platforms to point-of-care systems, has changed with the association of not only automation, but indeed the science to total quality management in its sphere.

RESULTS

Is automation the only solution to good diagnostics? The earlier we realize that our performances depend on varied aspects of science and technology, the better it would be. No one size fits all and, hence, each lab is unique in its own work mode and scope. Essentials of methodology, traceability, allowable error, measurement of uncertainty to name a few are challenges unique not only to each chemistry parameter, but also to various other analytes that we study. The concept of individual unique quality checks is the future.

CONCLUSION

There is an immeasurable paradigm shift over the past two decades of laboratory medicine and clinical biochemistry. Day-to-day advances in knowledge and technology imply that it is a constant learning for the laboratory physicians to deliver the best.

Immunology, Infection, Inflammation

Maternal Serum Endothelial Inflammatory Markers in Gestational Hypertension and Preeclampsia

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OBJECTIVE

Hypertensive disorders complicate 5 to 10% of all pregnancies and contribute to significant maternal morbidity and mortality. Endothelial dysfunction is considered to be central in the pathogenesis of hypertensive disorders. The present study was undertaken to evaluate endothelial inflammatory markers [homocysteine, serum intercellular cell adhesion molecule (sICAM)-1, serum vascular cell adhesion molecule (s-VCAM)-1, and tumor necrosis factor (TNF)-α] in normal pregnancy, gestational hypertension, and preeclampsia.

MATERIALS AND METHODS

The study included 150 primigravida with singleton pregnancy. Out of these, 50 women were normotensives, 50 had gestational hypertension, and 50 had preeclampsia. Maternal venous blood sample was collected before delivery. The serum separated was analyzed for serum homocysteine immediately and stored in aliquots at –20°C for estimation of TNF-α, sICAM-1, and sVCAM-1.

RESULTS

A significant increase was observed in serum homocysteine levels (11.48 ± 6.65, 13.30 ± 7.65 mmol/L) ($p < 0.05$), sICAM-1 (597.56 ± 343.16, 811.46 ± 217.95 ng/mL) ($p < 0.001$), and TNF-α (13.21 ± 9.0, 11.16 ± 6.65 pg/mL) ($p < 0.01$) in gestational hypertension and preeclampsia as compared with normotensive women. The VCAM-1 levels also showed an increase in both the hypertensive disorders; however, the increase was not found to be significant. Tumor necrosis factor-α levels showed a significant positive correlation with body mass index and systolic blood pressure, whereas ICAM-1 levels showed a significant positive correlation with both systolic and diastolic blood pressure in these patients.

CONCLUSION

Hypertensive disorders in pregnancy (gestational hypertension and preeclampsia) are associated with endothelial dysfunction and inflammation. Soluble ICAM-1 levels may be regarded as a biomarker for the severity of the clinical condition.

Inflammation in Nonalcoholic Fatty Liver Disease

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INTRODUCTION

Nonalcoholic fatty liver disease (NAFLD) refers to the presence of hepatic steatosis when no other causes for secondary hepatic fat accumulation are present. It has a wide histopathological spectrum ranging from simple, bland steatosis, which is usually associated with a benign prognosis, to nonalcoholic steatohepatitis, which is thought to possess the potential for progress to cirrhosis, and its inherent complications of liver failure and liver cancer. The NAFLD prevalence is estimated to be around 9 to 32% in Indian population. Its etiology is still unknown. It is more common in diabetic and obese individuals. The NAFLD is associated with insulin resistance and metabolic syndrome.

MATERIALS AND METHODS

A case–control study was conducted in Rama Medical College Hospital, a tertiary care hospital with 36 patients of diagnosed NAFLD and 30 age- and sex-matched controls. Anthropometric measurements including body mass index (BMI), waist circumference, and head circumference were done. Lipid profile was done using standard reagents and kits. Serum high-sensitivity C-reactive protein (hs-CRP) levels and tumor necrosis factor (TNF)-α were estimated by enzyme-linked immunosorbent assay.

RESULTS

It was found that triglycerides, total cholesterol, low-density lipoprotein were significantly higher in cases compared with controls. Also BMI (29.61 ± 4.89; 23.66 ± 3.4, $p < 0.001$) and hs-CRP levels and TNF-α ($p < 0.001$ for both) were significantly higher in cases compared with controls.

CONCLUSION

As hs-CRP and TNF-α are indicators of ongoing inflammatory process and hs-CRP is an independent factor involved in coronary artery disease and metabolic syndrome, it signifies increased risk of these in NAFLD. We also advocate its use for diagnostic workup and its further evaluation as a biochemical marker for NAFLD.

Prognostic Value of Serum Cholesterol Level in Sepsis

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OBJECTIVE

Infections and inflammation induce acute phase response, which impacts lipid metabolism. It has been reported that in acute tissue injuries serum cholesterol levels are depressed. This study aims to investigate the serum cholesterol levels at the time of admission for sepsis and during course of illness so as to find whether serum cholesterol level can be used as prognostic marker in sepsis.

MATERIALS AND METHODS

Baseline serum cholesterol level was done for patients admitted for sepsis diseases in the Department of Pediatrics, Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India, in August 2015 and repeated on 5th day of admission. A total of 40 patients were thus evaluated.

RESULTS

The average cholesterol levels at the time of admission were 138.5. On day 5 of admission, the level increased to 156.3. Patients with lower cholesterol levels had longer treatment duration and higher morbidity.

CONCLUSION

Serum cholesterol level may be used as prognostic marker in patients having sepsis.

Role of Serum Protein Electrophoresis and Immunotyping in Monoclonal Gammopathies

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OBJECTIVE

Monoclonal gammopathies are conditions characterized by abnormal synthesis and release of immunoglobulins into circulation. People with monoclonal gammopathy of unknown significance (MGUS) have an increased risk of developing serious diseases of bone marrow and blood like multiple myeloma, non-Hodgkin lymphoma (NHL), plasma cell leukemia, primary amyloidosis, solitary plasmacytoma, Waldenstrom's macroglobulinemia, etc. The study was done to evaluate the role of serum protein electrophoresis and immunotyping in diagnosing clinically significant diseases in asymptomatic subjects with MGUS.

MATERIALS AND METHODS

The study was done at the Department of Biochemistry. A total of 75 patients reporting for liver function test whose globulin levels were more than 45 g/L were evaluated for abnormal protein pattern by serum protein electrophoresis. The monoclonal protein migrates as a single entity in the electric field and is detected by the nonspecific protein stain as a more intensely stained band superimposed on the usual protein pattern. Immunotyping was used to identify the clonality of M-proteins observed on electrophoresis and to probe further for the presence of monoclonal proteins.

RESULTS

Out of 75 cases, 18 cases had monoclonal gammopathy. Seventeen cases were diagnosed to be multiple myeloma and one case was found to be of NHL. The percentage of myeloma patients according to heavy chains was immunoglobulin (Ig)G 70%, IgA 6%, and IgM 24%.

CONCLUSION

With the advent of an era of molecularly based treatment strategies and diagnostics, serum protein electrophoresis and immunotyping play an important role in the diagnosis of clinically significant gammopathies and in differentiating them from MGUS as it is crucial to follow-up cases of MGUS to carefully understand the evolution of this pathology and its malignant transformation process.

Serum γ-Glutamyl Transpeptidase and Its Association with Inflammation in Obese Young Adults

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OBJECTIVE

Obesity is one of the most recognized cardiovascular risk factors and known to trigger subclinical inflammation. Recent studies have shown an increase in incidence of obesity among young adults due to drastic changes in lifestyle and food habits. γ-Glutamyl transpeptidase (GGT), an enzyme marker of alcoholic hepatitis, is now considered as an inflammatory marker involved in atherogenic cardiovascular diseases, particularly in obese subjects. The primary objective of this study is to estimate serum levels of GGT and high-sensitivity C-reactive protein (hs-CRP) as a marker of inflammation and study their association in obese young adults.

MATERIALS AND METHODS

Thirty otherwise normal young adults with obesity [obesity was defined as body mass index > 30 kg/m^2] and 30 age- and sex-matched healthy controls, both male and female, between 18 and 40 years of age were recruited from General Medicine Department of Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India. Serum GGT is measured by calorimetric kinetic assay; hs-CRP is measured in plasma by immunonephelometry.

RESULTS

In obese young adults, GGT is significantly elevated [mean ± standard deviation (SD) 86.6 ± 12.7 IU/L] compared with controls (mean ± SD 38 ± 9.81 IU/L) (p-value < 0.001). Moreover, GGT is significantly correlated with hs-CRP (r = +0.2 p < 0.01).

CONCLUSION

Our findings suggest that elevated GGT and its positive association with inflammation in young obese adults may contribute to their cardiovascular risk. Thus GGT can be used as marker for cardiovascular risk estimation because the test is easy to perform, sensitive, and inexpensive.

High-sensitivity C-reactive Protein, Lipid Profile, and Atherogenic Ratios in Patients of Lupus Nephritis

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OBJECTIVE

Systemic lupus erythematosus-related cardiovascular disease (CVD) and atherosclerosis are important clinical problems, but may in addition also shed light on how immune reactions are related to premature atherosclerosis and atherothrombosis. Nephropathy offers an additional risk factor. Identifying patients at risk is important because early intervention slows or arrests the progression of cardiac disease in lupus nephritis (LN) patients. The aim of this study is to assess high-sensitivity C-reactive protein (hs-CRP), lipid profile, and atherogenic ratios as potential risk factors in patients of LN.

MATERIALS AND METHODS

A cross-sectional case–control study of 30 LN patients and 20 age- and sex-matched healthy controls was performed. Serum creatinine, hs-CRP, total cholesterol (TC), triacylglycerol (TG), and high-density lipoprotein (HDL) cholesterol (HDLc) were estimated. Atherogenic ratios [atherogenic index of plasma (AIP = log TG/HDLc), TC/HDLc, LDLc/HDLc] were calculated. Student's t-test and Pearson correlation were performed; p-value <0.05 was considered significant.

RESULTS

Mean ± standard deviation of TC (201.7 + 94) (p < 0.001), LDLc (117 + 80.2) (p = 0.016), TG (193 + 96.4) (p = 0.002), very LDLc (36.6 + 19.4) (p = 0.002) in LN patients was found significantly higher than controls. Atherogenic ratios, AIP (log TG/HDLc) (0.72 + 0.1) (p < 0.001), TC/HDLc (6.38 + 3.89) (p = 0.0001), LDLc/HDLc (3.6 + 0.4) (p = 0.001), and hs-CRP (26.5 + 48.9) (p = 0.03) were found significantly higher in LN patients compared with controls. We also find significant correlation between hs-CRP and creatinine in LN patients with r = 0.554, p = 0.001.

CONCLUSION

Our study shows the importance of the determination of lipid profile and atherogenic ratios for early detection of CVD risk in LN patients. The hs-CRP is an independent cardiovascular risk marker. So early screening of LN patients with serum hs-CRP, lipid profile, and atherogenic ratios helps in early detection of at-risk individuals and early intervention, which reduces considerable mortality and morbidity.

Correlation of Thyroid Hormones and C-reactive Protein Level in Neonatal Sepsis

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OBJECTIVE

To evaluate the prognostic role of thyroid hormones [free triiodothyronine (FT3), free thyroxine (FT4), thyroid-stimulating hormone (TSH)] in neonates with sepsis and to correlate their levels with C-reactive protein (CRP).

MATERIALS AND METHODS

Twenty-five neonates admitted for neonatal sepsis in the Department of Pediatrics, Post Graduate Institute of Medical Sciences, Rohtak, India, during July and August 2015 were evaluated for correlation of thyroid hormones and CRP level. Neonates with gestational age <37 weeks and birth weight <2 kg, babies of mothers with thyroid disorders, and those who had already received antibiotics were excluded from the study. Twenty-five neonates without sepsis served as controls.

RESULTS

Free thyroid hormone levels (FT3, FT4) decreased in neonates with sepsis as compared with values of FT3 and FT4 in normal neonates. There was not much difference in TSH level. Nonsurvivors had significantly reduced free thyroid hormones and high CRP levels.

CONCLUSION

There is a negative correlation between CRP and free thyroid hormone levels in neonatal sepsis. Low thyroid hormone and high CRP levels correlate with increased morbidity and mortality in neonatal sepsis.

Adenosine Deaminase Levels in Clinically Suspected Cases of Neonatal Sepsis

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AIMS AND OBJECTIVES

Adenosine deaminase (ADA) is a ubiquitous enzyme of the purine metabolism that plays a central role in the differentiation and maturation of the T and B lymphocytes. Adenosine is produced in the inflammatory conditions, and regulates inflammation and tissue remodeling. What causes poor responses of the newborn immune system to pathogens remains a mystery and poses a challenge to clinicians for tackling infections in neonates. The aim of the article is to study the levels of ADA among the neonates with clinically suspected cases of neonatal sepsis and determine clinical and laboratory correlation with plasma ADA levels.

MATERIALS AND METHODS

Eighty-five neonates who were admitted to our neonatal intensive care unit were included in the study. The relevant clinical details and laboratory tests results of C-reactive protein, blood culture, complete blood cell count were collected and correlated with ADA levels.

RESULTS

Confirmed neonatal sepsis cases were found to have very low level of ADA activity and the neonates who later developed secondary localized infection like pneumonia had high ADA activity.

CONCLUSION

Neonates who suffer and die from *sepsis* are likely to have had suppressed immune systems. Either T cells were activated in response to secondary infections like pneumonia or were defective and nonfunctional in case of sepsis.

Correlation of Serum Thyroid-stimulating Hormone, Cortisol, Iron, and Ferritin with Clinical Staging, Immunological Classification, AIDS, and HAART Status in HIV-infected Children

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OBJECTIVE

To estimate the serum levels of thyroid-stimulating hormone (TSH), cortisol, iron, and ferritin and correlate them with clinical staging, immunological classification, acquired immunodeficiency syndrome (AIDS), and antiretroviral therapy (ART) status in human immunodeficiency virus (HIV)-infected children aged 2 to 15 years.

MATERIALS AND METHODS

A hospital-based cross-sectional study conducted in 96 children of either sex aged 2 to 15 years diagnosed with HIV irrespective of having AIDS or not were taken from ART Centre, Mangaluru, India. Serum TSH, cortisol, and ferritin were estimated using enzyme-linked immunosorbent assay and serum iron by colorimetric method using semi-autoanalyzer kit. Data analysis was done using Statistical Package for the Social Sciences version 16 employing nonparametric tests for intergroup comparison of means and chi-square for categorical variables. Correlation analysis was done using Pearson's correlation.

RESULTS

Mean age of patients was 11.44 ± 2.9 years; 63% of cases revealed iron excess, 86.5% showed increased ferritin, 57.3% cases showed increased TSH, thus indicating toward hypothyroidism. In the study, 16.7% cases had adrenal insufficiency, whereas 36.5% cases showed excess of serum cortisol. Correlation analysis showed a positive correlation of ferritin with clinical staging and TSH with immunological classification based on CD4 values. Cortisol showed significant positive association with ART therapy status.

CONCLUSION

These endocrine alterations in the form of hypothyroidism, adrenal insufficiency, and excess and iron overload in HIV pediatric cases can have significant clinical impact, affecting growth and development and quality of life. This study thus emphasizes on the need for early detection and management of such conditions.

Role of Autologous Platelet-derived Growth Factors and Fibrin-rich Plasma in Management of Chronic Nonhealing Ulcers: A Pilot Study

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OBJECTIVE

The study was designed to assess the role of autologous platelet-derived growth factors (PDGFs) and fibrin-rich plasma in management of chronic nonhealing ulcers (CNHUs).

MATERIALS AND METHODS

A total of 30 CNHUs in 25 patients (after excluding 5 dropouts) were treated by applying locally antibiotic ointment containing autologous PDGFs and fibrin-rich plasma.

RESULTS

All the 30 ulcers showed signs of improvement upon the topical application of PDGF-enriched antibiotic ointment. A total of 22 out of the 30 ulcers achieved complete healing, and 8 ulcers were healed partially. The duration and degree of healing process was also affected by various patient-related factors.

CONCLUSION

The application of fibrin-rich plasma and PDGF-enriched antibiotic ointment was found to be very easy, cost-effective, and efficient in treating subjects with CNHU.

Serum Iron, Folate, Ferritin, and CD4 Count in Human Immunodeficiency Virus Seropositive Women

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OBJECTIVE

To study gynecological and hematological profile of HIV seropositive women and compare them with CD4 count.

MATERIALS AND METHODS

Two hundred seropositive females (age 18–25 years) attending antiretroviral therapy clinic were selected. Routine gynecological and hematological investigations were carried out. Study samples were drawn and serum iron, folate, and ferritin were analyzed by chemiluminescence, and CD4 count was determined by using flow cytometry.

RESULTS

Anemia was prevalent in seropositive women, especially in those with low CD4 levels. Serum folate and ferritin levels were significantly lower in females with lower CD4 levels. Serum iron levels were higher at low CD4 levels. The mean CD4 count in HIV seropositive anemic women was lower as compared with nonanemic women, suggesting that anemia improves with higher CD4 cell counts.

CONCLUSION

Plasma folate and ferritin levels are sensitive predictor of anemia in early HIV infections and these patients should have a regular monitoring of their folate and ferritin levels, especially with lower CD4 levels.

Serum Lactate Dehydrogenase Levels in Human Immunodeficiency Virus Positive Patients

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OBJECTIVE

Monitoring human immunodeficiency virus (HIV) disease progression and deciding the time to initiate highly active antiretroviral therapy (HAART) requires evaluation of CD4+ T-cell counts and HIV/ribonucleic acid viral load at regular intervals. Resource-restrained developing countries that cannot afford such expenses are looking forward to tests that can be done easily and are cost-effective to monitor HIV disease progression and treatment response. Abnormal liver biochemistries are a frequent feature of HIV disease. We therefore evaluated lactate dehydrogenase (LDH) activities in HIV-infected individuals.

MATERIALS AND METHODS

The study was carried out in Department of Biochemistry in a tertiary care center, which included 46 HIV seropositive patients, and 25 healthy seronegative individuals were included as controls. Serum LDH activity was measured in fresh serum sample (within 1 hour of collection) in both groups.

RESULTS

Mean level of LDH activity in controls was 160.13 ± 47.11 IU/L and in seropositive cases was 585.99 ± 186.95 IU/L. The difference is statistically highly significant.

CONCLUSION

Serum LDH activity in seropositive cases can be used to assess disease progression. It is a low cost and easily performed biomarker. We recommend a larger study to assess the role of LDH in disease progression and response to treatment.

Vitamin D Level in Children with Respiratory Tract Infections

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OBJECTIVE

Owing to decreasing outdoor activities, vitamin D deficiency is being increasingly reported in children. Vitamin D deficiency affects bone health and also acts as a risk factor for various cancers, autoimmune diseases, cardiovascular diseases, and respiratory disorders. Among children especially in the under-5 age group, respiratory tract infections are a major cause of morbidity and mortality. Recent studies have shown negative correlation between vitamin D level and respiratory tract infections. Therefore, this study was planned to find out vitamin D levels in children who presented with acute respiratory infections (ARIs) and to see whether vitamin D deficiency increase is associated with morbidity and mortality.

MATERIALS AND METHODS

A total of 50 patients aged 3 months to 5 years were enrolled over a period of 6 months, April to September 2015, who were admitted with ARIs. Relevant data regarding type of ARIs, vitamin D level, duration of hospital stay, associated comorbidities were collected and analyzed.

RESULTS

Totally, 50 children were enrolled; 33 (66%) had vitamin D deficiency; 30 (60%) were males; 29 (58%) belonged to lower middle class. Mean age was 37 months; 27 had bronchiolitis, 16 had bronchopneumonia, and 7 had lobar pneumonia. Average hospital stay for children with ARI-associated vitamin D deficiency was 5.2 days, while for those without vitamin D deficiency it was 3.7 days.

CONCLUSION

This study concludes that vitamin D deficiency is associated with greater incidence of ARIs. The role of vitamin D deficiency in causing ARIs needs to be further explored and whether prophylactic vitamin D supplementation may reduce ARI-associated morbidity and mortality.

Neonatal Meningitis and Biochemical Parameter in Cerebrospinal Fluid

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OBJECTIVE

Neonatal meningitis is the most life-threatening disease encountered in neonatology practice. Not only does it impose immediate threat to life but it also leaves various comorbidities behind once it gets cured. Cerebrospinal fluid (CSF) examination for various biochemical and microbiological parameters is the gold standard investigation for the diagnosis of neonatal meningitis. In developing countries where microbiological documentation of CSF infections is poor, the biochemical parameters often form the mainstay for diagnosing neonatal meningitis.

MATERIALS AND METHODS

This was a retrospective study. Relevant data were collected and analyzed for 36 babies who had been diagnosed with neonatal meningitis at the neonatal intensive care unit, Pt. Bhagwat Dayal Sharma, Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India, from May 2015 to September 2015.

RESULTS

A total of 21 babies were male, 19 were preterm, 20 were low birth weight. Average CSF protein level was 275. Average CSF sugar level was 35. Babies having CSF protein levels >200 had higher degree of associated comorbidities like neonatal jaundice and shock.

CONCLUSION

The CSF protein levels have a positive correlation, while CSF sugar levels have a negative correlation with the severity of neonatal meningitis. Also CSF sugar and protein levels often give an idea about the severity of various comorbidities associated with the neonatal meningitis.

Dyslipidemia in Rheumatoid Arthritis

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OBJECTIVE

To determine dyslipidemia in rheumatoid arthritis (RA).

MATERIALS AND METHODS

Control group comprised 25 healthy female subjects of age 30 to 50 years, while study group comprised 25 female patients with RA of more than 5 years. Nearly all female patients had erythrocyte sedimentation rate >30 mm/hour. Low-density lipoprotein (LDL), high-density lipoprotein (HDL), total cholesterol, and serum triglyceride levels were determined in established cases of RA (as per 1987 American College of Rheumatology criteria). Abnormal lipid levels were defined according to the Adult Treatment Panel III guidelines as total cholesterol ≥240 mg/dL, LDL ≥160 mg/dL, triglycerides ≥200 mg/dL, or HDL <40 mg/dL. Patients with the following characteristics were excluded: Diabetes mellitus, hypertension, hypothyroidism, hyperlipidemia treated with a lipid-lowering therapy.

RESULTS

In established RA, the LDL levels and total cholesterol levels were highly raised in RA patients and it was statistically very highly significant ($p < 0.001$) when compared with control group, whereas HDL levels were significantly lowered in RA patients and it was also statistically very highly significant ($p < 0.001$) when compared with control group, but triglycerides were slightly raised in RA patients although it was statistically insignificant ($p > 0.05$).

CONCLUSION

Our findings emphasize the need to raise awareness among health care professionals regarding the development of hyperlipidemia in RA patients. Screening for hyperlipidemia may be particularly important in patients with active RA to prevent cardiovascular-related morbidity and mortality.

To Evaluate the Electrolyte Disturbance in Acute Diarrhea: A Cross-sectional Study in Post Graduate Institute of Medical Sciences, Rohtak

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BACKGROUND

Diarrhea refers to the passage of loose or watery stools or an increased frequency of stools. Diarrhea is not a disease, but is a symptom of a number of illnesses. It can lead to dehydration and electrolyte (sodium, potassium) disturbance. One in four deaths in children under the age of 5 years is due to diarrhea. Around 8 to 11 million cases are being reported annually in India.

OBJECTIVE

To evaluate the electrolyte disturbance in acute diarrhea.

MATERIALS AND METHODS

Cross-sectional study. Children less than 5 years of age and suffering from acute diarrhea admitted in pediatric ward were included in the study and data were collected regarding their age, sex, grade of dehydration according to the World Health Organization classification, and electrolyte disturbance (sodium, potassium). All the categorical variables are expressed as percentage.

RESULTS

During this study, 279 children were enrolled. Out of 279 children, 125 (44.8%) were males and 154 (55.2%) were females. Out of 279 children, age distribution was 0 to 6 months (63, 22.7%), 7 to 12 months (138, 49.5%), 1 to 3 years (53, 18.9%), more than 3 years (25, 8.9%). Out of 279 children, mild (91, 32.6%), moderate (179, 64.1%), severe (9, 3.3%) dehydration and the sodium level in (mEq/L) 110 to 120 (45, 16.2%), 121 to 130 (86, 30.8%), 131 to 140 (144, 51.6%), 141 to 150 (4, 1.4%), more than 150 (00) and potassium level in mEq/L less than 3.5 (78, 27.9%), 3.5 to 4.5 (183, 65.5%), 4.5 to 5.5 (18, 6.6%), more than 5.5 (00) were found.

CONCLUSION

During this study, we found acute diarrhea is more during weaning period, 7 to 12 months children. Moderate dehydration is more common and there is more common hyponatremia and hypokalemia.

Serum Adenosine Deaminase: Can it be used for Diagnosis of Tuberculosis?

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OBJECTIVE

Tuberculosis is one of the main reasons for mortality and morbidity worldwide. The gold standard for diagnosing tuberculosis is mycobacterium culture, which is time consuming, whereas other diagnostic modalities are not very specific. Adenosine deaminase (ADA) levels in pleural fluid and sputum are studied by many researchers for diagnosis of pulmonary tuberculosis. It is not always possible to get such materials. Hence, we wanted to investigate the diagnostic importance of serum ADA in tuberculosis.

MATERIALS AND METHODS

This was a retrospective review comprising 134 patients who visited the Department of Pulmonary Medicine. These patients were grouped into three: Group I included 24 sputum-positive patients, group II – 25 sputum-negative or extrapulmonary tubercular patients, and group III – 85 patients of respiratory diseases other than tuberculosis. The fasting blood sample was collected and serum ADA was measured by kinetic method (Diazyme kit) on fully automated chemistry analyzer Hitachi-902. The results were analyzed statistically. The cutoff value was chosen according to a receiver operating characteristic analysis. The sensitivity and specificity were measured and Youden Index was calculated.

RESULTS

The serum ADA (mean ± standard deviation) values for groups I, II, and III were 25.25 ± 10.43, 38.08 ± 19.55, and 16.14 ± 5.46 U/L respectively. The best cutoff point was 24.50 U/L with 91.8% specificity and 65.3% sensitivity. The calculated area under the curve was 0.830 (95% confidence interval, 0.751–0.910).

CONCLUSION

Serum ADA may be considered as an additional tool for diagnosing tuberculosis.

Reproduction and Infertility

Maternal Serum Lipid Profile and Apolipoprotein A Levels in Pregnancies with Intrauterine Growth Restriction

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OBJECTIVE

To study maternal serum lipid profile and apolipoprotein A levels in pregnancies with intrauterine growth restriction (IUGR) and compare with the levels in normal pregnancies. Also, performed to compare the perinatal outcome in these pregnancies.

MATERIALS AND METHODS

This prospective observational study was conducted on 30 pregnant women at gestation 32 to 34 weeks with IUGR, and 30 uncomplicated pregnant women of same gestation 32 to 34 weeks attending antenatal outpatient department at Lady Hardinge Medical College, Alumni Association, New Delhi, India. Serum triglyceride (TG), total cholesterol (TC), high-density lipoprotein, and apolipoprotein A were estimated by autoanalyzer. The low-density lipoprotein (LDL) and very low-density lipoprotein (VLDL) were estimated by Friedewald's formula.

RESULTS

We found that serum TC (TC = 199.17 ± 49.06 mg/dL and 244.10 ± 53.17 mg/dL), TG (200.53 ± 60.25 mg/dL and 304.13 ± 69.12 mg/dL), LDL (98.19 ± 37.91 mg/dL and 127.07 ± 47.84 mg/dL), VLDL (40.11 ± 12.05 mg/dL and 60.83 ± 13.82 mg/dL), and apoplipoprotein A (47.71 ± 16.40 mg/dL and 163.30 ± 16.07 mg/dL) were significantly lower in the IUGR group as compared with control group. Perinatal complications were more in the IUGR group than control group, but were not statistically significant.

CONCLUSION

Serum lipid profile and apolipoprotein A were significantly decreased in IUGR group as compared with control group. No relation was found between lipid profile and apolipoprotein A levels and perinatal outcome. The decreased levels of TC, TG, LDL, VLDL, and apolipoprotein A levels can be used as a biochemical marker for detection of IUGR. However, it is recommended to do more study with a bigger sample size.

Evaluation of Homocysteine, Vitamin B_{12}, and Folic Acid Levels during Pregnancy and Preeclampsia

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OBJECTIVE

The study was conducted to evaluate homocysteine, vitamin B_{12}, and folic acid levels in maternal and cord blood of newborn of normotensive pregnant and preeclamptic women.

MATERIALS AND METHODS

One hundred and fifty pregnant women were grouped. Group I (control) comprised 50 normotensive women with singleton pregnancy immediately after delivery. Group II (study) comprised fifty (age- and gestation- matched women with singleton pregnancy) women with preeclampsia immediately after delivery. Group III (study) comprised fifty normotensive pregnant women who were recruited in the first trimester (8–12 weeks) that were followed in the second (24–28 weeks) and third trimesters (32–36 weeks). Samples were drawn during first, second, and third trimesters from group III subjects. Serum homocysteine, folic acid, and vitamin B_{12} levels were analyzed in maternal and cord blood by competitive immunoassay using direct chemiluminescence technology.

RESULTS

There was a rise in levels of vitamin B_{12} and folic acid in successive trimester as compared with homocysteine in which there was fall in second trimester followed by a slight rise in third trimester in group III. There was a significant rise in homocysteine levels and significant fall in vitamin B_{12} levels in third trimester. Folic acid levels were almost the same. Comparison of homocysteine, vitamin B_{12}, and folic acid levels in the three groups along with cord blood status will be presented and discussed.

CONCLUSION

These findings suggest that elevated homocysteine during pregnancy may be a risk factor for preeclampsia and raises the issue of possible beneficial effects from interventions with B vitamins to lower homocysteine.

To Assess the Serum Levels of Homocysteine in Pregnant Women and Analyze Gene – Nutrient Interaction Using Serum Homocysteine, Tetrahydrofolic Acid, and Dihydrofolate Reductase Levels

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OBJECTIVE

High incidence of neural tube defects (NTDs) in Uttarakhand, India is known from literature, but no study on prevalence of hyper-homocysteinemia and the interplay of gene– nutrient interactions in folic acid metabolism as probable causative factors has been done. The current study aims to fill this knowledge gap. The methyl tetrahydrofolate reductase gene has many prevalent polymorphisms, and these are associated with increased plasma homocysteine concentrations. Tetrahydrofolic acid (THFA) is an active form of folic acid. The enzyme dihydrofolate reductase (DHFR) converts ingested folic acid to THFA. Studies have suggested that the prevalent polymorphism of the DHFR gene leads to an increased risk of NTDs.

MATERIALS AND METHODS

In this clinic based cross-sectional study on pregnant women attending the Primary Health Centre of block Doiwala, Dehradun, a fasting blood sample in the morning was obtained and a complete short, in-person interview that included questions related to use of folic acid supplement was done, and blood samples for serum homocysteine, THFA, and DHFR levels were analyzed. A vigorous exclusion criterion evaluating use of any medications known to interfere with folate absorption or a history of any disorder or condition that could interfere with folate absorption or metabolism was also taken.

RESULTS

Results are awaited. The statistical analysis is still to be done.

CONCLUSION

The present study would give us an insight into the folate metabolism in pregnant women with special reference to the effects of MTHFR and DHFR polymorphism and their effects on homocysteine and THFA levels.

Hydatidiform Mole Presenting with Negative Urine Pregnancy Test and High Serum β Human Chorionic Gonadotropin Levels – The Hook Effect: A Case Report

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INTRODUCTION

Patients with hydatidiform mole usually have a positive urine pregnancy test [(for β human chorionic gonadotropin (hCG)] and high levels of serum βhCG. However, in some cases, urine pregnancy test is negative though serum βhCG levels are raised. In these patients, serum βhCG levels are very high – this has been termed as the hook effect. The case described here is in a 18-year-old female presenting with painful lower abdomen, enlarged uterus, and negative urine test for pregnancy, but highly raised serum βhCG levels showing "hook effect".

Role of Heme Oxygenase-1 in Preclampsia

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OBJECTIVE

To study both maternal and fetal aspects of preeclampsia by comparing the concentrations of heme oxygenase-1 in maternal and cord blood venous samples.

MATERIALS AND METHODS

Fifty pregnant women were selected and grouped as group I (control) comprising 25 normotensive women immediately after delivery; group II (study group) comprising of 25 age- and sex-matched preeclamptic women. Study samples were drawn (maternal venous blood and umbilical cord blood) and heme oxygenase-1 was analyzed by competitive enzyme linked immunosorbent assay.

RESULTS

There was significant rise in serum heme oxygenase 1 levels in preeclamptic women as compared with normotensive pregnant women ($p < 0.001$). Cord blood hemeoxygenase-1 levels in preeclamptic women were significantly higher than those of normotensive women ($p < 0.001$).The cord blood heme oxygenase-1 levels in both the groups were comparable with their maternal levels. Comparison of serum heme oxygenase-1 with outcome of pregnancy will be presented and discussed.

CONCLUSION

The findings of high serum heme oxygenase-1 levels in maternal and cord blood in preeclampsia support the role of oxidative stress and excessive inflammatory response in the pathogenesis of preeclampsia.

Comparison of Dehydroepiandrosterone Sulfate to Free Testosterone and Luteinizing Hormone to Follicular Stimulating Hormone Ratios in Polycystic Ovarian Syndrome Women

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OBJECTIVE

To compare dehydroepiandrosterone sulfate to free testosterone (DHEAS/FT) and luteinizing hormone to follicular stimulating hormone (LH/FSH) ratios in polycystic ovarian syndrome (PCOS) women.

MATERIALS AND METHODS

The present study was done in the Department of Biochemistry in collaboration with the Department of Obstetrics and Gynecology in which 30 PCOS cases and 30 age-matched healthy controls were enrolled. Fasting venous blood samples were collected from cases and controls for routine biochemical and hormone analysis after obtaining written consent and complete history.

RESULTS

We found that FT of cases (10.3 ± 17.1 pg/dL) showed significantly higher values than controls (1.84 ± 1.4 pg/dL) with $p = 0.011$ and had significantly positive correlation with body mass index (BMI) with $p = 0.014$. The DHEAS and FSH of cases had no significant raised value than controls ($p > 0.05$). The LH of cases (12.7 ± 8.9 mIU/mL) had significantly higher values than controls (7.02 ± 6.2 mIU/mL) with $p = 0.006$. The DHEAS/FT of cases (0.815 ± 0.95) showed significantly lower values than controls (1.922 ± 1.53) with $p = 0.001$. The LH/FSH ratio (2.25 ± 2.3) of cases was significantly higher than controls (1.01 ± 0.72) with $p = 0.008$. The LH/FSH ratio had 30% sensitivity and 93% specificity, but DHEAS/FT ratio had 16.7% sensitivity and 100% specificity for PCOS.

CONCLUSION

The DHEAS/FT ratio can be considered as a specific marker than the LH/FSH ratio, and LH/FSH ratio as a better sensitive marker than DHEAS/FT ratio in PCOS women.

Thyroid Hormone Parameters in Patients of Preeclampsia

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OBJECTIVE

To study both maternal and fetal aspects of preeclampsia by comparing thyroid-stimulating hormone (TSH), FT3, FT4, thyroid peroxidase antibody (TPO Ab), and thyroglobulin antibody (TG Ab) levels in maternal and cord blood venous samples.

MATERIALS AND METHODS

The study was conducted in 200 pregnant women with single intrauterine pregnancy of gestational age between 6th and 14th weeks grouped according to TSH levels: Group I (Control, n = 100): TSH levels between 0 to 2.5 mIU/L with normal FT_3 and FT_4; group II (Test, n = 100): TSH levels > 2.5 mIU/L with normal FT_3 and FT_4. Baseline thyroid function tests (TSH, FT_3, FT_4, TPO Ab, and TG Ab) were done. The patients were followed until delivery. Maternal and cord blood TSH were collected at the time of delivery. The TSH, FT_3, FT_4, TPO Ab, and TG Ab tests were done by competitive immunoassay using direct chemiluminescent technology.

RESULTS

Mean FT_3 and FT_4 levels are higher in maternal blood in group II as compared with group I. Mean TSH levels at first trimester in group II were significantly higher than group I. All patients in group I were thyroid auto-antibody negative. The TPO Ab positivity was 14% and TG Ab positivity was 7% in group II. Cord blood TSH values were higher in group II as compared with group I.

CONCLUSION

Euthyroxinemia is primarily important in early pregnancy to avoid abortions, and to maintain normal placental development and function throughout gestation for proper fetal neurodevelopment.

Correlation between Umbilical Cord Blood Lipid Profile and Maternal Age

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OBJECTIVE

The aim of this study was to investigate the relation between maternal age and neonatal umbilical cord blood lipid levels.

MATERIALS AND METHODS

This study was done on the cord blood of 50 healthy, full-term newborn infants (25 females and 25 males) in the Department of Biochemistry in collaboration with Department of Gynaecolgy, Pt. Bhagwat Dayal Sharma, University of Health Sciences, Rohtak, India. The serum was analyzed for total cholesterol (TC), triglyceride (TG), and high density lipoprotein cholesterol (HDL-C) by autoanalyzer (Konelab 30i, Trivitron) with the help of enzymatic methods using kits by Randox. The concentrations of low density lipoprotein cholesterol (LDL-C) were calculated using Friedewald equation.

RESULTS

A statistically significant negative correlation was observed between the cord blood HDL-C and maternal age ($r = -0.435$, $p < 0.05$). The LDL-C showed a positive correlation with maternal age, which was also statistically significant ($r = 0.350$, $p < 0.05$). There was no correlation between other cord blood lipids and lipoproteins levels with maternal age. The mean levels of TC and LDL-C in females were significantly more than the male neonates ($p < 0.05$) and the mean levels of HDL-C, VLDL-C, and TG were greater in male neonates, but the difference was not significant.

CONCLUSION

We found that with increasing maternal age, the HDL-C level in cord blood was decreased, which is an independent risk factor for cardiovascular diseases in adulthood. Significant positive correlation was seen between LDL-C levels in cord blood and maternal age. These findings may have negative implications on future cardiovascular health. However, determination of this relation needs to be explored in future longitudinal studies with more sample size.

Assessment of Thyroid Hormonal Status among Hyperglycemic Pregnant Women at Tertiary Level of Health Care System

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OBJECTIVE

To assess the thyroid hormonal status in hyperglycemic pregnant females.

MATERIALS AND METHODS

This study was conducted in the Department of Biochemistry in collaboration with the Department of Obstetrics and Gynecology of Post Graduate Institute of Medical Sciences, Rohtak, India. Forty pregnant women were enrolled in the study. Twenty pregnant women having increase blood glucose [(due to diabetes mellitus and gestational diabetes mellitus (GDM)] were included in test group and the rest 20 gestational age-matched females with normal blood glucose were taken as control. The American Diabetes Association criteria for 75 g 2-hour oral glucose tolerance test were used for diagnosing GDM. Serum free thyroxine, free tri-iodothyronine, and thyroid stimulating hormone were assessed in each subject by electrochemiluminescence technique. Plasma glucose was estimated by enzymatic method using autoanalyzer. Subjects with history of thyroid disease, drug consumption for thyroid dysfunction, gestational age less than 24 weeks and more than 28 weeks were excluded from study.

RESULTS

Subclinical hypothyroidism was detected in 10% of control group, 25% in GDM, and 25% in diabetic mothers, and overt hypothyroidism was seen in 5 and 6.25% respectively, in control group and GDM. Hyperthyroidism was present only in 5% of the control group. There was no statistically significant difference between thyroid dysfunction in GDM, diabetic mother, and control group. Thyroidal dysfunction (subclinical hypothyroidism) was found in GDM, diabetic mother, and control group, but was not statistically significant ($p < 0.05$).

CONCLUSION

Subclinical hypothyroidism was found more prevalent in hyperglycemic pregnant female in comparison with normal pregnant women. Although it was not statistically significant, but this study needs to be continued to evaluate fetal outcome among these subjects in future.

Insulin-like Growth Factor (IGF)-1 and Preeclampsia

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OBJECTIVE

Pregnancy-induced hypertension (PIH) causes significant maternal and perinatal morbidity and mortality. The present study was done for any possible role of insulin-like growth factor (IGF)-1 as a marker for severity of PIH.

MATERIALS AND METHODS

This study was conducted in the Department of Biochemistry in collaboration with Department of Obstetrics and Gynecology at Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, India from 1st December 2011 to 31st July 2012. Fifty women with age, body mass indices, and gestation matched with singleton pregnancy were enrolled and divided into two groups. Twenty-five were normotensive women, while 25 were hypertensive with systolic blood pressure reading ≥140 mm Hg or diastolic blood pressure ≥90 mm Hg with or without proteinuria. The exclusion criteria included history of diabetes, chronic hypertension, and liver or renal disease. The serum IGF-1 level was measured by DRG enzyme-linked immunosorbent assay (ELISA) kit. Statistical analysis was performed on Statistical Package for the Social Sciences. Student's t-test was applied where applicable.

RESULTS

Mean systolic and diastolic blood pressures in preeclamptic group were 159.60 ± 12.28 and 99.44 ± 6.59 mm Hg respectively, while, in control group, it was 116.32 ± 6.02 and 74.56 ± 5.08 respectively ($p < 0.001$). Mean serum IGF-1 levels were significantly decreased in preeclampsia mothers (73.2 ± 48.69 ng/mL) as compared with normotensive mothers (259 ± 45.39 ng/mL), ($p < 0.001$). Cord blood IGF-1 levels were also significantly decreased in preeclampsia mothers (33.2 ± 22.21 ng/mL) as compared with normotensive mothers (72.2 ± 28.65 ng/mL), ($p < 0.05$). Maternal IGF-1 had a strong inverse correlation with urinary albumin levels

among group II hypertensive mothers ($p < 0.05$). Mean serum uric acid in preeclamptics (5.172 ± 1.29) was significantly increased than control (3.972 ± 0.885), while serum creatinine, serum glutamic oxaloacetic transaminase, and serum glutamic pyruvic transaminase levels were insignificant in both groups.

CONCLUSION

The significantly low level of IGF-1 in hypertensive preeclamptic mothers in our study signifies the important role of this system in normal pregnancy. It may be useful for early detection and better resource management in planning preventive programs for PIH. Further studies are needed to validate our results and explore differences between our results and those of previous studies.

A Study of Serum Iron and Total Iron Binding Capacity in Preeclampsia

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OBJECTIVE

To estimate and compare serum iron and total iron binding capacity (TIBC) levels in preeclamptic women and normal pregnant women and assess the role of serum iron in the pathophysiology of preeclampsia.

MATERIALS AND METHODS

A case control study was performed with 30 already diagnosed cases of preeclampsia and 30 normal pregnant women in the age group of 15 to 35 years. Pregnant women with pre-existing hypertension, renal or liver diseases, diabetes mellitus, autoimmune diseases, or hemoglobin (Hb) disorders were excluded from the study. Fasting blood samples were collected from all the study subjects. Estimation of serum iron and TIBC was done by using commercially available kits by Agappe Diagnostics on Erba Chem 5 semiautomated analyzer. The results were statistically analyzed by applying unpaired students t-test.

RESULTS

Mean serum iron levels were significantly higher in cases as compared with controls (p-value < 0.001) and serum TIBC levels were significantly lower in cases as compared with controls (p-value < 0.001).

CONCLUSION

The findings of the study suggest that serum iron may have a role in the pathogenesis of preeclampsia. Thus, iron status of pregnant women should be assessed before giving them iron supplements, as these may cause more harm than benefit.

Effect of Weather on Cord Blood Thyroid-stimulating Hormone

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OBJECTIVE

Newborn suffers from hypothermia in the extra-uterine environment, soon after birth, leading to a transient increase in thyroid-stimulating hormone (TSH) levels. Winters are the most stressful periods in terms of cold stress.

MATERIALS AND METHODS

In this observational study, data of cord blood TSH and time of birth of 1,500 neonates were taken from hospital records, which were routinely screened for congenital hypothyroidism at the Christian Medical College and Hospital, Ludhiana, India. Two groups of neonates were formed on the basis of their birth months. In the first group (i.e., winters), neonates born in December, January, and February were taken, while those born in April, May, and June were included in the second group (i.e., summers).

RESULTS

The cord blood TSH of neonates born in winters (median CBTSH = 8.4 mIU/mL) was significantly higher ($p = 0.001$) than that of neonates born in summers (median CBTSH = 7.1 mIU/mL). The month-wise distribution of CBTSH did also show the same pattern in winters and summers. The recall rate was also significantly higher ($p = 0.002$) in winters (9.76%) than summers (4.84%).

DISCUSSION

Thyroid hormones play an essential role in successful transition to extra-uterine life. There is a sudden and transient increase in cord blood TSH especially in winters. It leads to increased recall rates (recall of neonates with cord blood TSH > 20 mIU/mL for further assessment to rule out congenital hypothyroidism at 3rd postnatal day) for congenital hypothyroidism screening programs. Thyroid hormones modulate the other hormones, such as thymulin in neonates, which deserve to be studied to enhance immunity and decrease morbidities in them.

Incidence of Renal Disorder in Relation with Serum Urea, Serum Uric Acid, and Serum Creatinine Levels among the Patients Attending JMCH in Relation to High Blood Sugar Levels – A Retrospective Study

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INTRODUCTION

Kidney disease is a worldwide public health problem. According to the World Health Report 2002 and Global Burden of Disease project, diseases of the kidney lead to approximately 850,000 deaths every year. In western countries, diabetes and hypertension account for over two-thirds of the cases of renal disorders. In India, diabetes today accounts for 40 to 60% cases of renal disorders. The aim and objective is to determine the incidence of renal disorder and abnormal serum uric acid level in patients attending JMCH, and their association with high blood sugar level. In addition, we planned to determine the relation between different age groups, sex, and incidence of renal disorder and serum uric acid level with high blood sugar level. A retrospective study was made based on the data available in the biochemistry wing of the Central Clinical laboratory and record room of JMCH. The data have been collected from 1st June 2014 to 31st May 2015, of all the patients who had undergone serum urea and serum creatinine tests and serum uric acid level and high postprandial blood sugar. It has been seen that patients having renal disorder based on serum creatinine and serum urea levels have high blood sugar levels (46.44%), and patients with abnormal serum uric acid level have high blood sugar levels (30%). The age group of more than 40 years has the highest number of patients with high sugar level and renal problems, and serum uric acid level and the number of renal disorder patients of females is more than males, whereas males are more than female in abnormal uric acid level. There is no as-such seasonal variation of renal problem and serum uric acid level with high blood sugar level.

Serum Hepcidin Levels in Gestational Diabetes Mellitus

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INTRODUCTION

Hepcidin is the central regulator of systemic iron homeostasis. A few studies have reported that serum levels of ferritin and hepcidin were elevated in gestational diabetes mellitus (GDM). There are no Indian data in this area.

OBJECTIVE

This study was done to test the hypothesis that serum hepcidin levels may be increased in patients with GDM and correlate it with markers of iron status and inflammation in these patients.

MATERIALS AND METHODS

Primigravidae (gestational ages between 24 and 28 weeks) with GDM and without GDM [as assessed by an oral glucose tolerance test (GTT)] were recruited from the Community Health and Development Hospital of Christian Medical College, Vellore, India. Participants with anemia (hematocrit < 33%) and other known complications of pregnancy were excluded. All biochemical estimations were performed in a fasting blood sample collected from participants at the time of their GTT.

RESULTS

Twenty-two women with GDM and 18 matched controls were studied. Values for hematocrit, serum levels of iron, ferritin, transferrin saturation, C-reactive protein (CRP), and total iron binding capacity (TIBC) were similar in both groups. Median hepcidin levels in those with GDM (12.65 ng/mL [IQR 10.14–24.10]) were not significantly different from those without and) were not significantly different from those without and".] (14.36 ng/mL [IQR 10.12–32.87]). Serum levels of hepcidin correlated positively with serum iron and ferritin and negatively with TIBC. No significant correlation was found between serum levels of hepcidin and CRP.

CONCLUSION

Serum levels of hepcidin and iron-related parameters did not differ in primigravidae with or without GDM. However, since sample sizes in this study were small, larger numbers need to be studied before definitive conclusions can be drawn.

Serum Uric Acid as a Prognostic Marker of Pregnancy Induced Hypertension

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OBJECTIVE

To study the association between serum uric acid (SUA) and maternal complications.

MATERIALS AND METHODS

A retrospective study of hospital records of 50 pregnancy induced hypertension (PIH) patients was done in the Department of Obstetrics and Gynecology of Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, India. Patients were divided into two groups – with SUA >6.5 mg% and with SUA <6.5 mg%.

RESULTS

The SUA of 6.5 mg% and higher was strongly associated with maternal complications like eclampsia, abruptio, intrauterine death, and ascites. Statistically significant elevation of SUA was found in women with eclampsia.

CONCLUSION

Serum uric acid >6.5 mg% is associated with increased maternal complications, especially, eclampsia. Thus, women with PIH with SUA >6.5 mg% should be offered termination of pregnancy.

Role of Hypocalciuria in Early Diagnosis of Preeclampsia

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OBJECTIVE

Hypercalciuria is seen in normal pregnancy, while preeclampsia is associated with hypocalciuria. Despite various tests, the early diagnosis of preeclampsia remains an enigma. Alteration in cellular Ca^{2+} level and hypocalciuria in preeclampsia has emerged as an important tool for early diagnosis. Hence, the objective of the study is to assess the efficacy of urinary calcium for the early diagnosis of preeclampsia.

MATERIALS AND METHODS

A case control study was conducted on a total of 200 pregnant patients with gestational age between 20 and 36 weeks and divided into two groups, *viz*., study (100 patients of preeclampsia) and control group (100 normotensive pregnant women). Random sample of urine was taken as specimen for urinary calcium estimation.

RESULTS

Urinary calcium in preeclampsia group was given as 4.91 ± 1.62 mg/dL and that of control was 12.43 ± 3.18 mg/dL. This was statistically significant with $p < 0.001$ with t-value given as 21.07. Standard error of mean was given as 0.16 and 0.31 respectively, for the case and control.

CONCLUSION

Estimation of calcium in a spot urine sample is a simple test, easily performed, and, hence, assures patient compliance. It has a good predictive value and, hence, justifies the cost and is suited to be adopted as a tool for early diagnosis for preeclampsia. It can, therefore, be recommended as a screening test for preeclampsia and could be offered to pregnant women after 20 weeks of gestation during their antenatal visit.

Effect of Isoflavones and Hormone Replacement Therapy on Lipid Profile in Postmenopausal Women

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OBJECTIVE

Postmenopausal women have higher incidence of cardiovascular disease compared with premenopausal women. This may be associated with alterations in the lipid profile. Hormone replacement therapy (HRT) is considered to be the most effective mode of treatment for postmenopausal complications. However, the Women's Health Initiative has identified important risk factors associated with the use of HRT, such as increased risk of breast cancer, endometrial cancer, and thromboembolic events. Dietary isoflavones, a phytoestrogen, are being widely used as a safer alternative to HRT, even though scientific evidence of their efficacy is poor or lacking. Hence, this study was undertaken to study the effect of isoflavones and HRT on the lipid profile of postmenopausal women.

MATERIALS AND METHODS

Prospective study was carried out on 100 postmenopausal women. Their baseline fasting lipid profile was done. They were divided into two groups of 50 each. Group I was given HRT and group II was administered isoflavones. Fasting lipid profile was repeated after 3 months.

RESULTS

Postmenopausal women on HRT showed reduced triglyceride ($p = 0.001$), low-density lipoprotein (LDL-C) ($p < 0.001$), very low-density lipoprotein (VLDL) ($p < 0.001$), and LDL/high-density lipoprotein (HDL) ($p = 0.001$) ratio as 13.3, 16.5, 12.5, and 26.4% respectively. The HDL-C was increased by 9.5% ($p < 0.01$). Postmenopausal women on isoflavones did not show uniform improvement. Decrease in serum cholesterol ($p < 0.05$) by 6%, LDL ($p < 0.05$) by 10.6%, and LDL/HDL ratio ($p < 0.05$) by 19.3%, along with an increase in HDL-C ($p < 0.05$) was observed.

CONCLUSION

Women on HRT showed better reduction in cholesterol, triglycerides, LDL-C, and LDL/HDL ratio in comparison with those on isoflavones.

Estimation of HbA_{1C} and Estrone Levels in Polycystic Ovarian Syndrome Women

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OBJECTIVE

To estimate HbA_{1C} and estrone levels in polycystic ovarian syndrome (PCOS) women.

MATERIALS AND METHODS

The present study was done in the Department of Biochemistry in collaboration with Department of Obstetrics and Gynecology in which 30 PCOS cases and 30 age-matched healthy controls were enrolled. Fasting venous blood samples were collected from cases and controls for routine biochemical and hormone analysis, hemoglobin, HbA_{1c} after obtaining written consent and complete history.

RESULTS

We found that HbA_{1C} showed significantly high values ($p = 0.002$) in cases ($6.03 \pm 1.03\%$) than controls ($5.35 \pm 0.43\%$). Among cases, 33.3% were in impaired glucose tolerance range (5.7–6.4%), 36.7% in diabetic range (≥6.5%), and 30% in nondiabetic range (<5.7%) according to the American Diabetic Association guidelines, 2015. About 20% of cases and 3.3% of controls were found to have fasting blood sugar >100 mg/dL. Estrone of cases did not show any significant difference than controls ($p > 0.05$), but 13% of cases had increased estrone levels than controls.

CONCLUSION

In conclusion, HbA_{1C} estimation is the earliest marker for glucose impairment and insulin resistance than fasting plasma glucose in newly diagnosed PCOS cases. Though estrone is a specific biomarker, it may not raise in the early phase of PCOS.

Perinatal Complications in Intrahepatic Cholestasis of Pregnancy

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OBJECTIVE

Intrahepatic cholestasis of pregnancy (ICP) is seen usually in the 3rd trimester of pregnancy. Overall incidence is 1.2 to 1.5% of Indian pregnant women. The biochemical abnormalities often include raised liver enzymes, conjugated bilirubin, and bile acids. The ICP can complicate fetal outcomes to a significant extent. Recurrence rate in subsequent pregnancy is very high (60–70%). The present study was conducted to find out the types and incidence of perinatal outcomes in pregnancy complicated with ICP, to initiate early management.

MATERIALS AND METHODS

In the present study, 51 pregnant women presenting with features of ICP and 49 age- and gravida-matched normal pregnant women were included as cases and controls respectively. Liver function tests were done by standard biochemical methods. Both cases and controls were followed 7 days postpartum to evaluate perinatal outcomes.

RESULTS

Total bilirubin (0.6 ± 0.08 *vs* 0.4 ± 0.03) mg%*; aspartate aminotransferase (48 ± 18.6 vs 27 ± 9.5) IU/L**; alanine aminotransferase (42 ± 14.2 vs 28 ± 6.1) IU/L**; alkaline phosphatase (251 ± 63 vs 159 ± 58) IU/L**; gamma glutamyl transpeptidase (41 ± 5.2 vs 35 ± 3.6) IU/L; albumin (3.3 ± 0.5 *vs* 3.2 ± 0.4) gm%; and total proteins (6.3 ± 1.2 *vs* 6.1 ± 1.5) gm% were obtained in cases *vs* controls. Significantly higher incidence of total complications in cases compared with controls (54.90% *vs* 12.24%)** were found, which include respiratory distress (23.52 *vs* 4.08)%**, meconium aspiration (9.80 *vs* 2.04)%**, preterm delivery (9.80 *vs* 4.08)%*, hyperbilirubinemia (1.96 *vs* 0.0)%, fetal bradycardia (7.84 *vs* 2.04)%**, and fetal loss (1.96 *vs* 0.0)%. (*p-value <0.05, **p-value <0.01).

CONCLUSION

The present study suggests increased total morbidity and mortality in perinatal period in babies born to women suffering from ICP. This advocates active monitoring, treatment, and induction of labor around 36 to 38 weeks after establishment of lung maturity in pregnancy associated with ICP.

Correlation of Cardiovascular Risk Factors with Serum Thyroid Stimulating Hormone, Prolactin, and Insulin Markers in Polycystic Ovarian Syndrome Patients in Coastal Odisha

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OBJECTIVE

Polycystic ovarian syndrome (PCOS) affects about ~5 to 10% of women of reproductive age. The PCOS is a complex disorder involving genetic and environmental factors. Thyroid dysfunction and hyperprolactinemia can cause ovulatory dysfunction. Metabolic complications associated with insulin resistance are increased in PCOS including adverse cardiovascular risk profile. This study aims at evaluating the correlation of cardiovascular risk factors with serum TSH, prolactin, and insulin resistance.

MATERIALS AND METHODS

This case – control study included 70 female subjects (aged 28 ± 5.44, without known diabetes mellitus, hypertension, thyroid disorders, cardiovascular diseases, hypoglycemic agents/lipid lowering drugs, hormonal medications) and equal number of age-matched controls. Lipid profile and fasting blood glucose were measured by commercial kits adapted to an autoanalyzer. Serum thyroid stimulating hormone (TSH), prolactin, insulin by clinical laboratory improvement amendments and insulin sensitivity by homeostatic model assessment-insulin resistance were performed.

RESULTS

Compared with controls, cases had significantly higher levels of fasting blood glucose (78.7 ± 9 *vs* 100 ± 15), lipid profile [total cholesterol (TC) 164 ± 9 *vs* 189 ± 25; triglycerides (TGs) 115 ± 4 *vs* 129 ± 15; low density lipoproteins (LDL) 80.3 ± 11.8 *vs* 118 ± 20.9)] in mg/dL, thyroid stimulating hormone (TSH) (2.1 ± 1.0 *vs* 4.1 ± 1.4) in µU/mL, prolactin (9.5 ± 3.7 *vs* 18 ± 15) in ng/mL, HOMA-IR (1.5 ± 0.9 *vs* 7.7 ± 5.4), and body mass index (26 ± 1.8 *vs* 28.1 ± 2.4). In PCOS women, fasting blood glucose showed significant positive

correlation with TC (r = 0.240**, p = 0.004), TGs (r = 0.203*, p = 0.016), LDL (r = 0.359**, p = 0.000), prolactin (r = 0.219**, p = 0.009), insulin (r = 0.205*, p = 0.015), and TSH with prolactin (r = 0.201*, p = 0.019).

CONCLUSION

This study concords the association between BMI, fasting glucose, dyslipidemia, TSH, and prolactin in PCOS, which may help to assess the risk of cardiovascular disease and infertility.

Study of Autoimmune Thyroiditis in Patients with Polycystic Ovarian Syndrome

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OBJECTIVE

To investigate the prevalence of autoimmune thyroiditis in patients with polycystic ovarian syndrome (PCOS).

MATERIALS AND METHODS

A total of 50 patients with PCOS were included to evaluate thyroid function and morphology; 50 age-matched women without PCOS were studied as a control group. The PCOS was defined as oligomenorrhea, hyperandrogenism, and exclusion of other disturbances of estrogen or androgen synthesis. All laboratory parameters were determined with automated immunoassays. Thyroid morphology was assessed by ultrasound.

RESULTS

The PCOS patients were characterized by an increased luteinizing hormone/follicle-stimulating hormone ratio, low progesterone, elevated testosterone, and a high prevalence of hirsutism, but no difference in estrogen levels were found. Thyroid function and thyroid-specific antibody tests revealed elevated thyroperoxidase or thyroglobulin antibodies. The PCOS patients had a higher mean thyroid stimulating hormone (TSH) level ($p < 0.001$) and a higher incidence of TSH levels above the upper limit of normal ($p < 0.001$).

CONCLUSION

This study demonstrates a three-fold higher prevalence of AIT in patients with PCOS.

Ferritin and Endothelin-1 in Patients of Gestational Diabetes Mellitus

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INTRODUCTION

The mechanisms involved in the development of gestational diabetes mellitus (GDM) are not completely understood. In GDM, pathogenesis of both chronic inflammation and endothelial dysfunction play a crucial role.

AIMS AND OBJECTIVE

The aim of the study was to determine the levels of ferritin, the marker of inflammation and endothelin-1, the marker of endothelial injury in GDM patients and compare the levels with normal pregnant females.

MATERIALS AND METHODS

A total of 100 subjects were included in the study and they were divided as group I – 50 pregnant women that were diagnosed as having gestational diabetes after undergoing glucose tolerance test with 100 g of glucose as per the World Health Organization criteria and group II – 50 age and gestational age-matched normal pregnant females. Fasting blood samples of the participants were collected at 24 to 28 weeks of pregnancy. Samples were taken in ethylenediaminetetraacetic acid tube and both ferritin and endothelin-1 were measured by enzyme-linked immunosorbent assay method.

RESULTS

Ferritin and endothelin-1 are significantly raised in GDM patients as compared with control group (p-value < 0.005 and < 0.05 respectively). Positive correlation was found between ferritin and endothelin-1 (r-value-0.488).

CONCLUSION

From this study, it is concluded that markers of both inflammation and endothelial injury are increased in GDM patients. The positive correlation between ferritin and endothelin-1 suggests their role in the pathogenesis of GDM. So, the monitoring of these parameters may help in the management of GDM, and to assess the risk of other complications due to endothelial injury in these patients.

Evaluation of Serum Heat Stable Alkaline Phosphatase in Hypertensive Disorder of Pregnancy

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OBJECTIVE

Prediction of hypertensive disorder of pregnancy by assessing the level of heat stable alkaline phosphatase (HSAP) and to establish its relationship with duration of pregnancy.

MATERIALS AND METHODS

The study was conducted in 100 women in their second-half of pregnancy, who attended the antenatal clinic in the Department of Obstetrics and Gynecology in the Regional Institute of Medical Sciences, Imphal, Manipur, India during Oct 2014 to August 2015. Serial estimations of serum HSAP were done by the method of Kind and King.

RESULTS

Levels of HSAP were found to be gradually increasing with the duration of pregnancy up to term. Level of HSAP showed a sudden high increase at about 15 days prior to the development of clinical detectable preeclamptic toxemia. It was also observed that level, even if increased, falls again on improvement of condition by proper management.

CONCLUSION

Estimation of HSAP is one of the easiest methods available. It showed increased levels in pre-eclamptic patients. Its detection in serum can help in early diagnosis, to adopt immediate measures to control it, and minimize maternal and fetal risk.

Evaluation and Comparison of 25 Hydroxy Vitamin D in Pregnancy-induced Hypertension and Normal Pregnancy

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AIM

Pregnancy-induced hypertension (PIH) is a multisystem disease complicating 5 to 8% of pregnancies, and is one of the top causes of maternal morbidity and mortality globally.

OBJECTIVE

To evaluate 25 Hydroxy Vitamin D levels in PIH and normal pregnancy.

MATERIALS AND METHODS

A total of 40 pregnant females with PIH of gestation 20 weeks or more and up to 35 years of age comprised the study group, and 25 normotensive pregnant females with comparable gestation period and age group comprised control group. Venous sample was collected and 25 hydroxy Vitamin D levels were determined with enzyme-linked immunosorbent assay kit.

RESULTS

The mean+SD value of study and control groups were 9.77 ± 6.69 and 15.03 ± 3.07 ng/mL respectively. Statistically significant ($p < 0.05$) difference was found in 25 hydroxy Vitamin D levels between the two groups. The 25 hydroxy Vitamin D levels were lower in the study group as compared with the control group.

CONCLUSION

Vitamin D supplementation (in PIH patients with low Vitamin D values) may be useful in preventing preterm birth outcomes and, therefore, alleviating fetal morbidity and mortality. Early detection of Vitamin D deficiency (both prior to conception or in early period of pregnancy and in previous history of PIH) may be helpful in preventing occurrence of PIH.

To Evaluate the Levels and Relationship of the Pituitary and Thyroid Hormones in Female Infertility

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OBJECTIVE

Evaluation of female infertility is centered on functional hypothalamo–pituitary–gonadal axis. Thyroid dysfunctions are also known to interfere with the physiology of reproduction and pregnancy. The objective of our study is to evaluate a relationship between the pituitary and thyroid hormones in female infertility.

MATERIALS AND METHODS

Fifty female patients of infertility, who visited the Department of Biochemistry, SGT Medical College, Hospital and Research Institute, Gurgaon, India for hormonal evaluation, were recruited for the study. After excluding other causes of infertility including tubal factors, genetic, or other anatomical factors; blood samples for thyroid stimulating hormone (TSH), luteinizing hormone (LH), follicle stimulating hormone (FSH), and prolactin were collected. Fifty age-matched healthy fertile females were recruited as controls and their blood samples were collected for similar hormone assay. These parameters were estimated by the enzyme-linked immunosorbent assay technique. Results were statistically analyzed.

RESULTS

Out of the patients in our study group, 78% had primary infertility while secondary infertility was seen in 22% of the patients. Majority of the patients came out to be euthyroid (83%). There was a significant (p-value <0.05) high serum level of LH and prolactin hormones in patients of infertility as compared with controls. Moreover, there was a positive correlation between the levels of TSH and LH as well as between TSH and prolactin; however, this correlation was significant only between TSH and LH and not between TSH and prolactin or TSH and FSH among the patients of the study group.

CONCLUSION

For the normal physiology of reproduction, the functions of pituitary as well as thyroid should be normal. From our study, we have elucidated that abnormalities of the thyroid gland affects the pituitary functions and thus, their evaluation becomes necessary in finding etiologies of the female infertility.

Hepatorenal Disorders

Relationship between Serum Levels of Albumin and C-reactive Protein in Patients with Chronic Kidney Disease

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OBJECTIVE

To evaluate and compare the following parameters in chronic kidney disease (CKD): Serum albumin as a marker of nutritional status, C-reactive protein (CRP) as a marker of inflammation, and the relationship between CRP and albumin levels.

MATERIALS AND METHODS

This study was carried out in the Department of Biochemistry in collaboration with the Department of Medicine, Guru Gobind Singh Medical College and Hospital, Faridkot, India. Study involved 60 predialysis CKD patients (age 40 ± 12 years), admitted indoor and attending outdoor. The following investigations were carried out: CRP by fluorescence immunoassay method utilizing

latex particles coated with CRP monoclonal antibodies (I-chroma), serum albumin levels on fully automated chemistry analyzer, and renal function by estimated glomerular filtration rate (eGFR).

RESULTS

The data were later statistically analyzed. The mean GFR was 38.3 ± 16.4 mL/minute/1.73 m^2. The mean value of CRP was 14.3 ± 11.4 mg/L. About 67% of patients had elevated CRP (>6 mg/L) ($p < 0.05$) and low serum albumin levels present with mean value (3.2 ± 0.7 gm/dL) ($p < 0.01$).

CONCLUSION

This has been a rare study in which these markers were compared in predialysis CKD patients. Our results indicate that a high degree of inflammation and malnutrition exists in predialysis patients, as seen by high CRP values and low serum albumin levels.

Secondary Hyperparathyroidism and Bone and Mineral Metabolism in Different Stages of Chronic Kidney Disease

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AIMS AND OBJECTIVES

Chronic kidney disease–bone mineral disorder (CKD-MND) has now been focused on, as it is one of the leading complications of CKD and responsible for increase in mortality and morbidity related to the disease. Deficiency of calcitriol, hypocalcemia, and hyperphosphatemia lead to proliferation of parathyroid and secondary hyperparathyroidism (SHPT). Elevated parathyroid hormone (PTH) with abnormal bone metabolism results in vascular calcification and an increase in cardiovascular disorder causing increased mortality in dialysis patients. However, due to potential side effects of vitamin D therapy, currently, treatment of SHPT has imposed a great problem. This study is an attempt to find out the relationship between serum calcium, phosphate, vitamin D, and PTH with the biochemical parameters and GFR at different stages of CKD.

MATERIALS AND METHODS

Serum PTH, Vitamin D, calcium, phosphorus, urea, creatinine, and GFR were estimated in different stages of CKD. Correlations between these parameters at different stages were then analyzed

RESULTS

Serum PTH was significantly higher at advanced stages of CKD. It was negatively correlated with creatinine clearance and serum calcium, but positively correlated with serum phosphate. Vitamin D also significantly decreased with decrease in GFR. A negative correlation was found with serum vitamin D3 and PTH.

CONCLUSION

Regular monitoring of vitamin D3, PTH, and minerals should be done for early treatment of secondary hyperparathyroidism and for preventing the complications related to it. Further studies are required in this regard so that proper treatment time intervention, dose adjustment, and complication prevention related to SHPT and vitamin D3 supplementation can be done.

Evaluation of Biochemical Parameters of Hepatic Involvement in Dengue Fever

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OBJECTIVE

To evaluate the biochemical parameters of hepatic involvement in admitted cases of Dengue fever reporting to a tertiary care hospital in North India.

MATERIALS AND METHODS

This single-center, retrospective study was performed by screening records of patients presenting with a febrile illness and confirmed Dengue serology based on IgG and IgM antibodies against the virus. The liver function test (LFT) was done by standard methods of autoanalyzer Randox. The study period was between 1 January 2014 and 31 December 2014.

RESULTS

Out of 103 confirmed cases of dengue, 40 cases were admitted in the above-mentioned period. The mean age of the patients was 31.8 years (14–67 years), and 28 patients (70%) were male. Fever was the most-common presentation at time of admission (95%) with mean duration of 5.2 days (1–15 days), prior to hospitalization. Rash and/or arthralgia was present in 13 patients (33%), and 6 patients (15%) had bleeding manifestation. Icterus was presenting feature in 4 patients (10%) and one patient presented with encephalopathy. Clinical examination revealed hepato-splenomegaly in 20% and ascites/pleural effusion in 27.5%. Hyperbilirubinemia (serum bilirubin >2 mg/dL) was seen in 10% (4) and raised transaminases (>2 ULN) in 47.5% (19). The mean serum albumin was 3.16 (1.8–4) and INR were and 1.06 (1–1.45). Only 4 patients (10%) needed intensive care unit admission and none of the patients had dengue shock syndrome or renal failure. There was no mortality in the study cohort, and the mean stay in the hospital was 3.8 days.

CONCLUSION

Hepatic involvement was seen in half of affected dengue patients with raised transaminases (aspartate aminotransferase>alanine aminotransferase). Synthetic functions remain essentially normal. The disease has a benign course and carries good prognosis in the absence of renal failure and shock syndrome.

Effects of Hypofractionated Radiotherapy with and without Concurrent Chemotherapy on Liver and Renal Function Tests and Hematological Parameters

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AIMS AND OBJECTIVES

To evaluate effects of hypofractionated radiotherapy schedule of palliative radiation with and without chemotherapy on liver and renal function tests and hematological parameters in patients diagnosed as locally advanced head and neck carcinoma (LAHNC).

We report our experience with palliative local radiation therapy utilizing the "QUAD-shot" regimen in LAHNC.

MATERIALS AND METHODS

Group I (n = 20) is the study group, and it received paclitaxel 60 mg/m^2 1 hour prior to the first day of each radiation cycle, and group II (n = 20) control received only palliative radiotherapy. Radiation was delivered at 3.7 Gy per fraction twice a day for 2 days and repeated every 3 weeks for 3 cycles. Toxicity was graded utilizing a standardized scale of the World health Organization toxicity criteria.

RESULTS

Hematological toxicity, grades I, II, III, and IV in the study group *vs* control group were as follows: 25 *vs* 20%, 3.33 *vs* 10.0%, and none for grades III and IV toxicity.

Liver toxicity, grades I, II, III, and IV, in study group *vs* control group were as follows: 0 *vs* 6.67%, 3.33 *vs* 06.67%, and none for grades III and IV toxicity. Renal toxicity, grades I, II, III, and IV, in study group *vs* control group were as follows: 5% *vs* 10% and none for grades II, III, and IV.

CONCLUSION

Despite adding paclitaxel, the toxicity profile remains low and, therefore, may serve as an alternative for patients in poor condition with locally LAHNC.

Effect of Prestorage Irradiation on Renal and Liver Function Tests on Stored Blood

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OBJECTIVE

Preservation and storage of red blood cells is necessary for ready availability of blood supply for transfusion. Blood is subjected to gamma radiation before storage to avoid graft *vs* host reaction. Liver and renal function tests were assessed and compared during conventional preservation of nonirradiated and preirradiated blood in this study.

MATERIALS AND METHODS

A 450 mL of blood from 30 healthy donors was taken and divided into two equal groups, one of which was subjected to gamma radiation at a dose of 2155 cGy for 8.4 minutes. Both the groups were stored in the blood bank under conventional storage conditions. Samples were collected from these blood bags and analyzed and compared for urea, uric acid, creatinine, aspartate aminotransferase and alanine aminotransferase on days 0, 3,7,14, and 21.

RESULTS

Preirradiated samples showed significant change in creatinine ($p = 0.014$) 7th day onwards, while significant change in uric acid ($p = 0.003$) was observed 14th day onwards in preirradiated samples in comparison with nonirradiated. The change in other parameters was not found to be significant in different samples.

CONCLUSION

It may be concluded that transfusion of blood after 7 or more days of storage can alter creatinine levels, which may worsen the condition in patients receiving massive transfusion, who are at a risk for acute kidney injury. A word of caution is advised for these patients, and blood transfused should either be fresh or should be transfused within a period of 1 week of storage after exposure to radiation.

Clinical Impact of Free Triiodothyronine in End Stage Renal Disease

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OBJECTIVE

End stage renal disease (ESRD) is a frequent cause of alterations in thyroid function without any underlying intrinsic thyroid disorder. In ESRD, the metabolically active hormone is free triiodothyronine. Free T_3 is a strong predictor of adverse clinical outcomes in various clinical conditions. Low fT_3 in patients with ESRD is associated with inflammation and possibly higher cardiovascular mortality. The objective of the present study is to correlate free T_3 and total T_3 with renal function in ESRD.

MATERIALS AND METHODS

A case control study was done in the Department of Biochemistry, Osmania General Hospital, Hyderabad, India. The study included 40 healthy controls and 40 cases of ESRD. Free T_3 and total T_3 were measured by chemiluminiscence immunoassay, and blood urea and serum creatinine were measured by semiautoanalyzer.

RESULTS

Free T_3 and total T_3 were significantly decreased ($p < 0.0001$) and urea and creatinine were significantly increased ($p < 0.0001$) in ESRD patients when compared with controls.

CONCLUSION

Reduced T_3 in ESRD patients is due to decreased peripheral conversion of T_4 to T_3, while production of T_3 in thyroid gland is normal. Low free T_3 is a strong and independent predictor of poor prognosis in dialysis patients thus, implicating this alteration in the high mortality of ESRD. It is suggested that thyroid hormones should be evaluated in ESRD patients, and thyroid hormone replacement should be given to these patients to maintain euthyroid status.

Study of Insulin Resistance and Lipid Profile in Nonalcoholic Fatty Liver Disease Patients

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OBJECTIVE

Nonalcoholic fatty liver disease (NAFLD), a chronic metabolic disorder, is characterized by lipid deposition in the hepatocytes of liver parenchyma in absence of significant alcohol intake. The NAFLD has been proposed as the hepatic manifestation of metabolic syndrome (MS), with insulin resistance (IR) as the common pathophysiological mechanism. The NAFLD is strongly associated with obesity, but body fat distribution appears to play a more important role in pathogenesis of NAFLD. The present study is to identify the relative contribution of MS and IR to alanine transaminase (ALT) activity in NAFLD.

MATERIALS AND METHODS

A case control study of 90 subjects divided into three groups – healthy controls (n = 30), NAFLD without diabetes mellitus (n = 30), and NAFLD with diabetes mellitus (n = 30). Fasting levels of plasma glucose, serum insulin, lipid profile, and ALT were estimated. The IR was calculated by homeostatic model assessment-IR.

RESULTS

Fasting insulin levels, IR, and triglyceride levels were significantly increased ($p < 0.0001$) and high density lipoprotein (HDL) cholesterol levels were significantly decreased ($p < 0.0001$) in NAFLD with or without diabetes patients when compared with controls. The ALT levels did not show statistical significance between the cases and controls.

CONCLUSION

Nondiabetic and diabetic obese patients were simultaneously categorized by IR; those with predominant IR had a higher prevalence of NAFLD and metabolic dyslipidemia thus, confirming the pathophysiological role of hyperinsulinemia in the events leading to the development of fatty liver. Thus, this study suggests that strategies to prevent fatty liver might focus on dietary and/or drug interventions that improve insulin sensitivity.

Incidence of Glucose-6-Phosphate Dehydrogenase Deficiency among Icteric Neonates

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OBJECTIVE

Glucose-6-phosphate dehydrogenase (G6PD) deficiency is the inherited X-linked disorder, which can cause neonatal hyperbilirubinemia. As it is very common in the Middle East region, our aim of the study was to find the G6PD deficiency among icteric neonates.

MATERIALS AND METHODS

The study was conducted at the Maternity and Children Hospital, Najran, Saudi Arabia for 1 year from June 2014 to June 2015. We studied 200 icteric neonates, who were admitted in the nursery, during the study period. Each infant was studied for birth weight, gestational age, age at the time of presentation, presence of cephalhematoma, sepsis and neurological signs, peak bilirubin level, age at peak bilirubin level, and whether phototherapy or exchange blood transfusion given during hospital stay. Each baby was tested for complete blood count, reticulocyte count, ABO and Rh blood types, direct antiglobulin test, and quantitative G6PD estimation.

RESULTS

There were 56 (28%) patients who were G6PD deficient; 144 (72%) had normal activity of the enzyme. A total of 12 neonates were given phototherapy. The sex distribution was 59.5% males and 40.5% females among G6PD-deficient neonates. Fisher exact test is 0.00, which is highly significant as $p \leq 0.001$. None of them developed kernicterus.

CONCLUSION

We concluded that infants with G6PD deficiency developed jaundice earlier than infants with normal G6PD enzyme levels. Early detection of this enzymopathy and close surveillance of the affected newborns may be important in reducing the risk of severe hyperbilirubinemia.

Evaluation of Serum Calcium and Inorganic Phosphate Levels in Chronic Kidney Disease Patients

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OBJECTIVE

To study the levels of serum calcium and inorganic phosphate in chronic kidney disease (CKD) patients and also to find out its correlation with stages of CKD.

MATERIALS AND METHODS

A case control study was conducted among 75 CKD patients and 75 controls in the Department of Biochemistry in collaboration with Department of Medicine, Regional Institute of Medical Sciences, Imphal, India from September 2014 to August 2015, and serum calcium was measured by O-Cresolphthalein method. Inorganic phosphate was measured by Modified Gomori's method. Serum creatinine was measured by alkaline picrate method and albumin by bromocresol green method. Absorbance was measured using calorimeter and analysis was done.

RESULTS

Mean calcium level in cases was (8.33 ± 0.802) mg/dL, as compared with controls (9.99 ± 0.7.37) mg/dL, which was significant ($p < 0.001$). Mean inorganic phosphate level in cases was 5.31 ± 0.472 mg/dL as compared with controls (3.39 ± 0.440) mg/dL ($p < 0.001$), which was also significant. Calcium levels in stage-3 disease were (8.94 ± 0.923) mg/dL, stage-4 (9.91 ± 0.827) mg/dL, and stage-5 (10.19 ± 0.585) mg/dL. Inorganic phosphate levels in stage-3 (4.65 ± 0.427) mg/dL, stage-4 (4.95 ± 0.407) mg/dL, and stage-5 (5.51 ± 0.330) mg/dL.

CONCLUSION

The present study shows significant higher levels of phosphate in study cases. No significant difference was found in the mean corrected calcium level among cases and control groups. There were increasing calcium and phosphate levels in cases with advancing stages of chronic kidney disease.

Study of Serum Sodium and Potassium Level in Patients with Alcoholic Liver Disease Attending JMCH and their Causes of Hospital Admission

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INTRODUCTION

Hyponatremia is a common abnormal finding in approximately 57% of hospitalized patients with chronic liver disease and in 40% of outpatients with liver disease. Chronic alcoholic patients experience low blood concentrations of key electrolytes as well as potentially severe alterations in the body's acid–base balance. Aim of the study is to evaluate serum sodium and potassium levels in patients with alcoholic liver disease attending JMCH. The study design is hospital-based case control study. For the study, 40 number of cases are selected on the basis of clinical history, and 40 number of apparently healthy age- and sex-matched individuals have been taken up from normal population as control group. The liver function tests and serum sodium and potassium will be done on Vitros 250 autoanalyzer based on principle of reflectance spectroscopy. After evaluation, hyponatremia is found among the cases and statistically significant. However, the serum potassium level is mildly decreased and no statistically significant results were found.

Exchange Transfusion in Neonatal Hyperbilirubinemia and Related Biochemical Parameters

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OBJECTIVE

Neonatal jaundice is one of the commonest problems faced by neonatologists. Often, the babies having neonatal jaundice associated with risk factors like ABO/Rh incompatibility or sepsis require exchange transfusion. Various biochemical parameters like serum bilirubin, urea, and electrolytes need to be monitored well to avoid any exchange-related complications. This study was planned to correlate various biochemical parameters in babies undergoing exchange transfusion.

MATERIALS AND METHODS

This was a retrospective study. Relevant data were collected and analyzed for 25 babies, who had undergone exchange transfusion at NICU, Post Graduate Institute of Medical Sciences Rohtak, India, from May 2015 to September 2015.

RESULTS

About 16 babies were male, 14 were preterm, and 17 were low birth weight. Average day of life was day 4. About 11 had ABO incompatibility, while 9 had Rh incompatibility. This study found that the average pre-exchange serum bilirubin was 23.6. Average

postexchange bilirubin level was 14.5. Post 6 hours, serum bilirubin was 16. Hyperkalemia was quite common postexchange. Three babies required repeat exchange transfusion. Average neonatal intensive care unit stay was 3 days, while average hospital stay was 11 days.

CONCLUSION

Timely conducted exchange transfusion helps in salvaging babies from acute bilirubin encephalopathy. Meticulous monitoring of various biochemical parameters during and after exchange helps in early detection of exchange-related complications.

Study of Relationship of Abnormal Liver Enzymes with Serum Cholesterol and Triglyceride Levels in Patients with Nonalcoholic Fatty Liver Disease and its Association with Type II Diabetes

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OBJECTIVE

To determine the relationship between the serum cholesterol and triglyceride of the diagnosed NAFLD patients with the levels of their liver enzymes and the prevalence of type II diabetes among them.

MATERIALS AND METHODS

Thirty NAFLD patients were randomly selected from the radiology Department of KIMS, Odisha, India in the age group of 30 to 55 years. Their lipid profile and liver enzymes were compared, and their fasting blood sugar (FBS) and postprandial blood sugar were checked for screening of diabetes. The patients were subdivided into diabetic and nondiabetic. The relationship of serum cholesterol and triglycerides levels were compared with the liver enzymes within each group and between groups and significant differences were analyzed using various statistical methods.

RESULTS

Most NAFLD patients showed moderately high mean cholesterol level (200 mg/dL ± 25) and alanine aminotransferase (ALT) level (60 ± 17 IU/L). Mean triglyceride (TG) level was (175 ± 13) mg/dL, aspartate aminotransferase was around (40 ± 6) IU/L, and FBS level was (110 ± 20).There is a strong positive correlation ($p < 0.001$) between the mean cholesterol and TG in patients with their mean ALT levels.

CONCLUSION

Abnormal lipid profile has been found in NAFLD patients with elevated serum ALT, which is more prevalent among diabetics. So, these patients need to go for biochemical and radiological evaluations to prevent further complications.

A Study of Lipid Profile in Patients of Cholelithiasis in Punjab

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INTRODUCTION

Cholelithiasis is one of the most common gastrointestinal diseases throughout the world. Indian studies have shown that the incidence of this disorder is more in Northern India with a female preponderance. It is now widely accepted that the primary event in pathogenesis of cholelithiasis is an altered lipid metabolism arising from a combination of factors, such as excess dietary fat, obesity, metabolic syndrome, and androgenic factors. Most studies have shown a varied increase in total cholesterol, low density lipoprotein cholesterol, triglycerides, and a mean age of incidence between 40 and 50 years.

We observed a change in the demographic pattern of this disorder in our tertiary care hospital located in the state of Punjab. The concept of occurrence of this disease in "fat, fertile, female of forty" seems to be changing, and the disease is increasingly affecting nonobese females of the younger age group and also the male population.

AIM

The present study has been planned to study the demographic profile and lipid profile pattern of cholelithiasis in the population of Punjab and observe if there is any change in the above in comparison with the previous studies in literature.

MATERIALS AND METHODS

A total of 250 patients of clinically and radiologically confirmed cholelithiasis will be included in the study and their lipid profile will be evaluated and compared with healthy controls. The gender and age of onset of disease shall be noted.

This study will help in stressing the need for early lifestyle modifications to prevent the morbidity from this disease.

A Pilot Study on the Effects of Highly Active Antiretroviral Therapy on Liver Enzymes and Kidney Function in Human Immunodeficiency Virus Patients in Silchar Medical College and Hospital, Assam

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INTRODUCTION

The emergence of highly active antiretroviral therapy (HAART) has led to dramatic improvements in prolonging survival of human immunodeficiency virus (HIV) infected patients. However, the main drawback of HAART that long-term use has is the potential to cause liver and kidney derangements that may be life threatening. This may warrant discontinuation of therapy.

OBJECTIVE

To examine the functional integrity of the liver and kidney from the effects of HAART and elucidate whether these episodes are associated with any risk factors.

MATERIALS AND METHODS

The study was carried out at the ART Center in liaison with the clinical biochemistry laboratory, Silchar Medical College, Assam, India. This study assessed the prevalence of hepatic and renal toxicity in HAART naive and HAART-treated subjects. Liver enzymes mainly alanine aminotransferase (ALT), aspartate aminotransferase (AST), and creatinine values were assessed in autoanalyzer.

RESULTS

The prevalence of hepatotoxicity based on elevated ALT analytes above upper limit of normal was 18% in HAART-treated and 8% in HAART-naive patients. Variations in ALT levels between cases and control were found to be significant ($p = 0.016$). For AST (p-value = 0.0043) was considered very significant. Creatinine (p-value = 0.8) was not considered to be significant.

CONCLUSION

Study results will help health care providers to pay greater attention to individualized treatment and in harmonizing HAART regimens and prescription dosage in order to reduce toxicity levels.

Study of Serum Zinc and Serum Magnesium in Clinically Diagnosed Cases of Neonatal Hyperbilirubinemia

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OBJECTIVE

To estimate serum zinc and serum magnesium in neonates diagnosed with hyperbilirubinemia.

MATERIALS AND METHODS

The study included 160 neonates admitted to the Department of Pediatrics, AMCH. A total of 80 with hyperbilirubinemia were taken as study group and 80 without nonhemolytic hyperbilirubinemia were taken as control group. Serum zinc level was estimated by colorimetric method. Serum magnesium level was measured by the Calmagite method. Serum bilirubin level was estimated by mod. Jendrassik and Grof's method. Tests were carried out in semiautomatic analyzer in the department of biochemistry in AMCH.

RESULTS

Results suggested significant decrease in serum zinc level in the study group compared with control group ($p < 0.001$) and negative correlation was found between serum zinc and serum bilirubin in neonates with jaundice. Results also suggested significant

increase in serum magnesium level in study group compared with control group ($p < 0.001$) and positive correlation was found between bilirubin and magnesium in neonates with hyperbilirubinemia.

CONCLUSION

This study reveals decrease in serum zinc and increase in serum magnesium in neonates with hyperbilirubinemia. Zinc deficiency results in deficient synthesis of assorted enzymes that play a role in the bilirubin metabolism. Magnesium ion, one of the most important antagonistic regulators of NMDA receptors, acts by blocking NMDA receptor mediated neuronal injury.

Study of Changes in Serum Enzymes, Uric Acid, and Magnesium in Children with Hyperbilirubinemia

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OBJECTIVE

Hyperbilirubinemia in pediatric patients may lead to development of chronic liver disease, if left untreated or wrongly interpreted. This study was an attempt to measure a set of biomarkers in terms of clinical significance and possible use as biochemical markers that may be helpful in the appropriate management of patients.

MATERIALS AND METHODS

Bilirubin levels were estimated in blood samples of children (age group 1–5 year) received in the biochemistry lab. Forty subjects who were found to have increased total bilirubin (up to 5 mg/dL) were taken for the study. Their serum was subjected to estimation of serum glutamic oxaloacetic transaminase (SGOT), serum glutamic-pyruvic transaminase (SGPT), lactate dehydrogenase (LDH), amylase, uric acid, and magnesium on Randox autoanalyzer. These results were compared with 40 age- and sex-matched healthy controls. Independent t-test was applied for analyzing data.

RESULTS

The result showed significantly increased levels of SGOT, SGPT, LDH ($p < 0.001$), and amylase ($p < 0.05$) and decreased levels of magnesium ($p < 0.001$) as compared with controls. For uric acid, there was no significant change.

CONCLUSION

The findings of this study highlight that these biomarkers can act as potential markers that may play an important role in the prognostic aspect of disease. Therefore, these should be an integral part of routine workup in children suffering from jaundice, as they can be easily measured in the lab. They might reflect the degree of impairment and response to treatment. However, studies with larger sample size might throw more light to explore. Further biochemical evaluation and optimal approach can be done in this regard.

Comparative Evaluation of Liver Function Tests in Patients with Human Immunodeficiency Virus and Human Immunodeficiency Virus Tuberculosis Coinfection

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INTRODUCTION

The human immunodeficiency virus (HIV) and the tuberculosis (TB) co-infection (HIV–TB) are contributory to each other in causing a progressive decline in the cell- mediated immunity and a damage to the hepatobiliary system.

AIMS AND OBJECTIVES

The aim of our study is to estimate the extent of liver damage by evaluating the liver function tests in patients with HIV and HIV–TB coinfection prior to the start of antiretroviral therapy (ART) and ATT.

MATERIALS AND METHODS

About 100 confirmed HIV positive cases were enrolled in this study. The cases were divided into two groups; group I: 50 subjects with TB (HIV–TB) and group II: 50 subjects without TB (only HIV). About 50 healthy controls were also included, group: 0.

serum bilirubin, total protein, albumin, alanine transaminase (ALT), aspartate transaminase (AST), and alkaline phosphatase (ALP) were estimated biochemically by using semiautoanalyzer (ERBA XL600, Transasia) in their respective methods.

RESULTS

The serum total bilirubin, ALT AST, and alkaline phosphatase ALP levels were significantly higher in the cases (group II: Only HIV) compared with those in the controls (group 0), and much more in the cases associated with TB co-infection (group I: HIV–TB). The group I subjects had lower serum total protein and albumin levels and altered albumin/globulin ratios as compared with the controls. A statistically significant difference was absent in the serum total protein levels between the group II cases and the group 0 controls. No significant differences were observed in the values of serum total protein, albumin and globulin, and the albumin/globulin ratios among the two cases groups (1 and 2) when compared.

CONCLUSION

The results have shown the importance of estimating liver function test parameters, prior to the start of antitubercular drugs (ATD) and ART in these cases. Hence, a mandatory performance of LFT is recommended in all the cases of HIV and HIV–TB, as it is simple and cost effective.

Clinical Utility of Neutrophil Gelatinase Associated Lipocalin and Heart-type Fatty Acid Binding Protein as Early Biomarkers of Acute Kidney Injury Following Cardiopulmonary Bypass Surgery

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OBJECTIVE

To compare the urinary levels of neutrophil gelatinase associated lipocalin (NGAL) and heart-type fatty acid binding protein (H-FABP) after cardiopulmonary bypass surgery (CPB) with serum creatinine and to determine the sensitivity, specificity, and positive predictive values of these biomarkers to detect acute kidney injury.

MATERIALS AND METHODS

Urinary catheter was clamped and 10 mL of fresh urine was collected from CPB patients at 6, 24, and 48 hours after surgery. The collected urine was stored under sterile conditions at –80°C until further analysis of NGAL and H-FABP using sandwich enzyme-linked immunosorbent assay method. Simultaneously, 3 mL of venous blood was collected from central line and serum creatinine was measured by automated enzymatic method. Acute kidney injury (AKI) was defined as an increase in serum creatinine by ≥0.3 mg/dL above baseline within the first 2 postoperative days.

RESULTS

The AKI occurred in 51% (n = 14) of patients who underwent CPB. Urinary NGAL significantly increased in AKI patients at 6 hours and 48 hours after the surgery with p-value of 0.033 and 0.002 respectively. The H-FABP was not significant on any of the postoperative days. The ROC curve analysis of NGAL gave a cutoff value of 28.9 µg/g with specificity of 77% and sensitivity of 71% at 6 hours, and a cutoff value of 33 µg/g with specificity of 70% and sensitivity of 78%.

CONCLUSION

Hence, NGAL can be considered as a novel biomarker for the early detection of AKI. The H-FABP does not show any significant correlation.

Association between Serum Uric Acid Level and Nonalcoholic Fatty Liver Disease

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OBJECTIVE

To study serum levels of uric acid in nonalcoholic fatty liver disease and normal subjects.

MATERIALS AND METHODS

Study consisted of 50 cases diagnosed with nonalcoholic fatty liver disease and 50 normal subjects as control in age group of 31 to 60 years from medicine department of Government Medical College and Hospital, Nagpur, India. Nonalcoholic fatty liver disease was diagnosed based on the abdominal ultrasonographic findings. Serum uric acid level was estimated by uricase–peroxidase method. Uric acid quartiles were categorized into four groups and the number of subjects who came under each group was noted.

RESULTS

The mean uric acid concentration (mg/dL) for cases was 5.70 ± 1.56 and control was 4.70 ± 0.90 with $p < 0.05$, which is significant.

CONCLUSION

Serum uric acid levels are significantly associated with nonalcoholic fatty liver disease and high uric acid levels showed a higher incidence of nonalcoholic fatty liver disease compared with low serum uric acid level.

Alcoholism, Drugs, Environmental, Toxicology

Biochemical Markers in Alcoholic Liver Cirrhosis

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OBJECTIVE

To study De Ritis ratio and gamma glutamyl transferase (γ-GT) along with total sialic acid (TSA) in alcoholic liver cirrhosis and to correlate the utility of this parameter as a diagnostic indicator in liver function.

MATERIALS AND METHODS

A case – control study was carried out in 60 subjects, of whom 30 were cases with chronic alcoholism 31 to 50 years of age, admitted in the medicine ward of our college with clinical and ultrasonographic evidence of cirrhosis of liver without hepatic encephalopathy and gastrointestinal bleed and 30 were matched healthy controls without any disease visited for routine check-up at our outpatient department. The aspartate aminotransferase, alanine transaminase, and γ-GT were determined by routine methods, and TSA was determined by the method of Pluncinsky et al.

RESULTS

Serum levels of De Ritis ratio (2.069 ± 0.295), activity of γ-GT (109.53 ± 59) and TSA (70.1 ± 13.6) in liver cirrhosis subjects were higher than in healthy controls (De Ritis ratio 1.037 ± 0.338, γ-GT 25.7 ± 10.29, TSA 52.16 ± 7.21) and were statistically significant ($p < 0.001$).

CONCLUSION

Our observed results show increase in the levels of serum De Ritis ratio, activity of γ-GT and TSA, pointing their role in the diagnosis of alcoholic liver cirrhosis. De Ritis ratio was found to be positively correlated with serum γ-GT ($r = 0.708$, p-value < 0.001) and serum TSA ($r = 0.660$, p-value < 0.001) respectively. Assessment of De Ritis ratio, γ-GT, and TSA in combination is a sensitive means of detecting the severity of alcohol-induced liver damage.

Effect of Chemical Particles of Cigarette Smoke on Ventilatory Function Test

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OBJECTIVE

The objective of this study was to compare ventilatory functions in nonsmokers and smokers to analyze the extent of impairment in the airways.

MATERIALS AND METHODS

Parameters recorded were peak expiratory flow rate (PEFR), forced expiratory volume over 1 second (FEV_1), forced volume vital capacity (FVC), forced expiratory flow $(FEF)_{25–75\%}$, and $FEV_1/FVC\%$. For each participant, chest X-ray was also taken. We have done comparison of ventilatory functions between nonsmokers and smokers.

RESULTS

It was observed that values of PEFR, FEV_1, FEV_1/FVC, and $FEF_{25–75\%}$ significantly decreased in smokers ($p < 0.001$) as compared with nonsmokers. Our results indicate that smokers are at high risk of developing narrowing of airways in comparison to nonsmokers depicted by lowering of $FEF_{25–75\%}$ ($p < 0.001$).

CONCLUSION

Smokers are at high risk of developing obstructive airway diseases. It is due to the effect of free radical produced by cigarette smoke. The free radical causes inflammation, which results in narrowing of airways.

Metabolic Syndrome

Effect of Yoga on Biochemical Parameters in Diabetes Mellitus

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OBJECTIVE

Diabetes mellitus (DM) is a metabolic disorder with biochemical derangements. There is a growing body of evidence showing that hyperglycemia and dyslipidemia are linked to increased cardiovascular risk. It has been demonstrated that high levels of total cholesterol, triglycerides, low-density lipoprotein (LDL), very low-density lipoprotein, glycated hemoglobin (HbA1c), hypertension, and low high-density lipoprotein are significantly associated with coronary heart disease. Stress which is an integral part of life is the causative factor for diabetes, hypertension, and cardiovascular diseases. So, yoga is gaining popularity not only in reducing medication but also slowing down disease progression with proven benefits.

MATERIALS AND METHODS

Study comprised 30 patients with DM aged 40 to 50 years who performed a set of yogic exercises for 3 months. Blood pressure, HbA1c, and fasting lipid profile were measured before and after yoga.

RESULTS

Glycated haemoglobin is the best indicator of glycemic control. Three months of yoga resulted in reducing values of HbA1c; the result was very highly significant ($p < 0.001$). Blood pressure and lipid profile were chosen as variables to assess increased atherosclerotic risk in DM. Baseline values of blood pressure, total cholesterol, and serum triglycerides were on higher side, but highly significant ($p < 0.01$) reduction was observed after yoga.

CONCLUSION

Specific yogic postures and massage stimulate pancreas as well as increase autonomic nervous system, resulting in improvement in all deranged biochemical parameters seen in DM. Therefore, yoga may be used as a safe therapeutic modality along with conventional drug therapy in type II DM patients.

Urinary Microalbumin Excretion in Metabolic Syndrome: A Hospital-based Study

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OBJECTIVE

To explore the association of microalbuminuria and metabolic syndrome.

MATERIALS AND METHODS

The present study was conducted at Netaji Subhash Chandra Bose Subharti Medical College and Hospital. Out of a total of 176 subjects, 88 were cases and similar number were controls; 88 subjects (46 females and 42 males) of age group 16 to 65 years who fulfilled the criteria of metabolic syndrome proposed by the International Diabetes Federation 2005 were taken as cases and 88 healthy subjects of comparable age and sex were taken as controls. Microalbuminuria was defined as urine albumin–creatinine ratio of 30 to 300 mg/g.

RESULTS

Urinary albumin creatinine ratio was significantly higher in cases as compared with controls. We observed that 22.7% of cases had microalbuminuria, out of which 21.7% were females and 23.8% were males, whereas 4.5% of control subjects had microalbuminuria, out of which 6.5% were females and 2.4% were males. All components of metabolic syndrome were associated with increased risk of microalbuminuria, with the strongest association for high blood pressure.

CONCLUSION

Our study revealed a strong relationship between microalbuminuria and metabolic syndrome. Thus, microalbuminuria may be considered as a promising parameter of metabolic syndrome.

Occurrence of Metabolic Syndrome among Obese and Nonobese Individuals Residing in Rural Areas of Rajasthan

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OBJECTIVE

Numerous studies have reported an association between metabolic syndrome and obesity. Very little data are available about metabolic syndrome in nonobese persons, especially in rural population. This study was undertaken to identify the presence of metabolic syndrome among obese and nonobese individuals residing in the rural areas of Rajasthan.

MATERIALS AND METHODS

The material consisted of 300 adults in the age group of 20 to 70 years, selected from rural population, attending the outpatient department of NIMS Medical College, Jaipur Rajasthan, India. They were divided into two groups, obese and nonobese, on the basis of established criteria. Presence or absence of metabolic syndrome according to the National Cholesterol Education Program's Adult Treatment Panel III criteria was observed using conventional clinical laboratory methods.

RESULTS

Of the 300 subjects selected for the study, 12.66% subjects had metabolic syndrome. The comparison between obese and nonobese individuals with and without metabolic syndrome was done by Chi-square test. Among the obese subjects, presence of metabolic syndrome was seen in 28.57% of individuals, and among the nonobese subjects, 7.17% of individuals showed the presence of metabolic syndrome; p-value is < 0.0001, which is highly significant.

CONCLUSION

The presence of metabolic syndrome can be considered as an indicator of gradual socioeconomic transition of rural society from simple food habits and active lifestyle toward urbanization, which if not dealt with properly can culminate into alarming consequences resulting from deprivation of workforce and resources inherent in the rural areas.

Association of Oxidized Low-density Lipoprotein Receptor 1 Gene Polymorphism in Patients with Metabolic Syndrome

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OBJECTIVE

Metabolic syndrome (MetS) is associated with abnormal lipid profile and high cardiovascular risk. Oxidized low-density lipoprotein receptor 1 (OLR1), a cell surface endocytosis receptor, recognizes, internalizes, and degrades oxidized low-density lipoprotein (LDL) in vascular endothelium and plays a role in the pathogenesis of atherosclerosis. The aim was to explore the association of OLR1 gene polymorphism in patients with MetS.

MATERIALS AND METHODS

Forty cases fulfilling the International Diabetes Federation diagnostic criteria and 40 age- and sex-matched healthy controls were genotyped for OLR1 gene (single-nucleotide polymorphism [SNP]: IVS4–73C>T, rs3736234) by restriction fragment length polymorphism polymerase chain reaction. Serum oxidized LDL was estimated by enzyme-linked immunosorbent assay. Association

between the gene polymorphism and occurrence of MetS was estimated by odds ratio (OR), which was calculated by unconditional logistic regression models.

RESULTS

The T allele of OLR1: IVS4-73 C>T SNP is associated with significantly increased risk of developing MetS (OR: 14.79, 95% confidence interval: 1.80–121.2, $p < 0.05$). No association was found between the SNP and serum oxidized LDL levels, although serum oxidized LDL was significantly increased in the cases as compared with controls ($p < 0.0001$).

CONCLUSION

The intronic SNP: IVS4-73 C>T of OLR1 gene has significantly increased risk of developing MetS.

Correlation of Metabolic Syndrome with Male Androgenetic Alopecia

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OBJECTIVE

The relationship between alopecia and individual components of metabolic syndrome (MetS) was initially evaluated in around 2010. Thus, this striking association made us to evaluate the correlation of MetS in young males with early androgenetic alopecia (AGA).

MATERIALS AND METHODS

This study was carried out in 75 male patients presenting with AGA and compared with healthy controls after obtaining consent. Clinical evaluation was done by taking patient detailed history, measured waist circumference, and blood pressure (BP). Patients were investigated after overnight fasting.

RESULTS

Metabolic syndrome is defined when three or more of the following risk determinants are present: (1) increased waist circumference (>102 cm) for men; (2) elevated triglycerides (≥150 mg/dL); (3) low high-density lipoprotein (HDL) cholesterol (<40 mg/dL) in men; (4) hypertension (≥130/≥85 mm Hg), and (5) impaired fasting glucose (≥110 mg/dL). So, the results of our study coincide with the criteria, and MetS was seen in 38.5% of patients with AGA as compared with the control group (5%), and the difference was statistically significant ($p < 0.001$). Also, in comparison with controls, patients with AGA showed significantly high triglycerides, systolic BP, diastolic BP, glycated hemoglobin levels along with significantly lower HDL cholesterol levels ($p < 0.001$).

CONCLUSION

It was very much apparent from our study that male AGA is associated with metabolic syndrome and its components. It is well studied now that MetS is positively associated with an increased risk for mortality from cardiovascular disease. Therefore, Indian male patients aged <35 years with hair loss should be screened for MetS and its components to avoid increasing cardiovascular disease risk and worsening metabolic profile. Metabolic syndrome is a significant public health problem even in one of the poorest states of India that needs to be tackled with proven strategies to decrease the mortality rate from cardiovascular disease at young age.

Diurnal Variation in Serum Insulin Levels in Patients with Metabolic Syndrome with Obstructive Sleep Apnea

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OBJECTIVE

Obstructive sleep apnea (OSA) is both a feature and risk factor of metabolic syndrome (MS). The study was done to know the diurnal variation of insulin in patients with MS with and without OSA and compare them with healthy controls.

MATERIALS AND METHODS

The present study was conducted in the Department of Biochemistry and Pulmonary and Critical Care Medicine, Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak. Forty cases of MS were taken up for study and divided into

two groups of 20 each, i.e., patients with OSA [apnea–hypopnea index (AHI) >5, group I] and patients without OSA (AHI <5, group II). Twenty healthy controls without OSA and body mass index matched (group III) were also taken. The diagnosis in cases was made by history, clinical examination, anthropometric measurements, biochemical tests, and polysomnography. Serum insulin was estimated in all 60 subjects in blood samples collected between 10 and 11 PM and again from 7 to 8 AM.

RESULTS

Morning and nighttime insulin levels of group I and nighttime insulin levels of group II were significantly higher than respective values of group III. Thus, morning and night insulin levels of MS patients with OSA and without OSA respectively, were significantly higher than healthy controls. There was no significant difference in morning or nighttime insulin levels in MS patients with or without OSA. Insulin night to morning ratio was similar in all three groups. Nighttime insulin levels were significantly higher than morning levels in all three groups.

CONCLUSION

While OSA is also known to cause insulin resistance and hyperinsulinemia, in the present study, OSA along with MS did not have any additional significant impact on the insulin levels or its diurnal variation.

Testosterone in Metabolic Syndrome

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OBJECTIVE

To study the association between testosterone levels and metabolic syndrome in men.

MATERIALS AND METHODS

A case – control study was carried out on 50 adult male patients (>18 years) with metabolic syndrome recruited from the medicine outpatient department of Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences Rohtak and 50 age-matched healthy controls. Metabolic syndrome was diagnosed as per the National Cholesterol Education Program's Adult Treatment Panel III 2001 criteria. Patients taking hormonal preparations or suffering from liver disease or chronic illness like tuberculosis, cancer, etc. were excluded from the study. After obtaining an informed written consent from each participant, 5 mL of fasting venous blood sample was collected under all aseptic conditions. Serum separation was done by centrifugation, and the sample was analyzed in Erba XL30i autoanalyzer for fasting blood glucose and lipid profile. Total testosterone levels were estimated by chemiluminesence method on ADVIA Centaur CP autoanalyzer.

RESULTS

Mean total testosterone level in cases (323.30 ± 143.44 ng/dL) was significantly lower than mean total testosterone level of controls (515.34 ± 172.11 ng/dL), with p-value < 0.001. Mean fasting blood glucose, triglyceride, total cholesterol, low-density lipoprotein, very low density lipoprotein (VLDL), and waist circumference were significantly raised in cases compared with controls. Systolic blood pressure was significantly higher in cases than controls ($p < 0.05$). Fasting blood glucose, triglyceride, and VLDL had an inverse correlation with serum total testosterone in both cases and controls, whereas high-density lipoprotein demonstrated a positive association.

CONCLUSION

Low testosterone levels are associated with metabolic syndrome in men. As such, long-term interventional studies can be done to assess the effect of testosterone replacement in these cases.

Comparison of High-sensitivity C-reactive Protein with the Components of Metabolic Syndrome

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OBJECTIVE

The metabolic syndrome (MetS) is a constellation of risk factors of metabolic origin that are accompanied by increased risk for cardiovascular disease (CVD) and diabetes. The MetS consists of an atherogenic dyslipidemia, elevation of blood pressure (BP)

and glucose, prothrombotic and proinflammatory states. Various studies show that increased abdominal fat accumulation is an independent risk factor for coronary artery disease, hypertension, stroke, and diabetes, thereby leading to MetS. High-sensitivity C-reactive protein (hs-CRP) is an inflammatory marker and induced by cytokines produced by accumulated adipocytes and then increases in MetS. The hs-CRP seems to be a stronger predictor of cardiovascular events than low-density lipoprotein cholesterol, and it adds prognostic information at all levels of MetS. The aim of this article is to study waist circumference (WC), lipid profile, fasting blood glucose (FBG), hs-CRP, and BP in patients with MetS and compare with healthy controls and to correlate hs-CRP with the components of MetS.

MATERIALS AND METHODS

A total of 100 subjects were taken for the study: 50 were patients with MetS and 50 were healthy controls. Patients were examined for the features of MetS, in the hospital of Navodaya Medical College, Raichur.

RESULTS

The WC was proportionately high in patients with MetS when compared with healthy controls. Significant increase in lipid parameters, FBG, hs-CRP, and BP was seen in patients with MetS as compared with healthy controls.

CONCLUSION

Dyslipidemia, hyperglycemia, hypertension, and raised hs-CRP accompanied with excess weight gain than total adipose tissue in MetS. It may be concluded from the study that monitoring hs-CRP along with WC, FBG, triglyceride, high-density lipoprotein cholesterol, and BP in obese individuals can prevent the development of MetS and hence, it can be used as prognostic marker of MetS and CVD risk.

Diurnal Variation in Serum Leptin Levels in Patients with Metabolic Syndrome with Obstructive Sleep Apnea

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OBJECTIVE

Obstructive sleep apnea (OSA) is both a feature and risk factor of metabolic syndrome (MS). The study was done to know the diurnal variation of leptin in patients with MS with and without OSA and compare them with healthy controls.

MATERIALS AND METHODS

The present study was conducted in the Department of Biochemistry and Pulmonary and Critical Care Medicine, Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak. Forty cases of MS were taken up for study and divided into two groups of 20 each, i.e., patients with OSA (apnea–hypopnea index [AHI] >5, group I) and patients without OSA (AHI <5, group II). Twenty healthy controls without OSA and body mass index (BMI) matched (group III) were also taken. The diagnosis in cases was made by history, clinical examination, anthropometric measurements, biochemical tests, and polysomnography. Serum leptin was estimated in all 60 subjects in blood samples collected between 10 and 11 PM and again from 7 to 8 AM.

RESULTS

Leptin levels of morning and night of MS patients with or without OSA were significantly higher than healthy controls; there was no significant difference in morning or nighttime leptin levels in MS patients with or without OSA. Leptin night to morning ratio was significantly lower in group I *vs* group III. Leptin night to morning ratio was significantly decreased in MS patients with OSA as compared with healthy subjects, while there was no significant difference in MS patients without OSA and healthy controls. Nighttime leptin levels were significantly higher than morning levels in all three groups. The MS with OSA patients had higher leptin levels than BMI-matched healthy controls.

CONCLUSION

Obstructive sleep apnea may lead to higher leptin levels in BMI-matched subjects. The results suggest decreased nighttime leptin secretion or delay in peak of leptin secretion, which is usually observed after midnight (2:00 to 4:00 AM) in healthy persons. Thus, hypoxia in OSA may have stimulated the early morning leptin secretion as the mean apnea–hypopnea index (AHI) in our patients with MS and OSA (group I) was 35.17 ± 26.03.

Role of D-dimer in Diabetes Mellitus with or without Myocardial Infarction

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INTRODUCTION

Diabetes mellitus (DM) is a leading cause of vascular morbidity. The etiology of diabetic vascular complication is multifactorial. Alteration of blood coagulation and fibrinolysis along with poor glycemic control in diabetes has also been implicated in the development of diabetic vascular complications. Plasma level of D-dimer reflects the amount of lysed cross-linked fibrin and hence, is an accepted marker of hypercoagulability. Thus, there is a possibility that the high levels of D-dimer found in type II diabetic patients, because of altered fibrinolysis, can have more deleterious outcome in them compared with nondiabetic individuals.

AIM

The aim of this study is to evaluate the level of plasma D-dimer in type II DM patients with or without complications.

MATERIALS AND METHODS

A cross-sectional study was conducted at the Clinical Biochemistry Laboratory with collaboration of the medicine department and cardiac intensive care unit (ICU) at Seth V.S. Hospital, Ahmedabad. Hemoglobin A1c (HbA1c) and D-dimer in 60 confirmed diabetic patients with different durations of diabetic history were analyzed. All the patients were divided into two groups: Group I (newly diagnosed type II DM without complications attending to medicine outpatient and health checkup department) consists of 32 cases and group II [patients with type II DM admitted in cardiac ICU within 6 hrs of clinical signs and symptoms of acute coronary syndromes and cases of myocardial infarction (MI) like chest pain with or without radiation, shortness of breath, chest heaviness, electrocardiogram changes suggestive of MI, and further clinical and laboratory confirmed cases of MI] consists of 28 cases. Samples were collected in two vacutainers – citrate for D-dimer, ethylenediaminetetraacetic acid for HbA1c. Analysis of HbA1c was measured by high-performance liquid chromatograph method on Bio-Rad D-10 and D-dimer by turbidimetric immunoassay on IL ACL Elite Pro.

RESULTS

Using analysis of variance p-value, we conclude that there is significant difference in mean of HbA1c among two groups and significant difference in mean of D-dimer among two groups. In the present study, we can detect the relationship between alteration in coagulation/fibrinolysis and diabetic vascular complications in patients with type II DM. The D-dimer was found elevated in patients with longer duration of DM along with CAD.

CONCLUSION

The D-dimer is a novel risk marker for prediction of CAD and should be employed as an additional test for improving the risk assessment for CAD in DM.

Expression of Platelet Activating Factor – Acetyl Hydrolase in Patients with Metabolic Syndrome

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OBJECTIVE

Metabolic syndrome (MS) is a constellation of atherogenic risk factors, and patients with MS are prone to atherosclerosis. Metabolic syndrome and atherosclerosis are characterized by low-grade systemic inflammation. Platelet activating factor – acetyl hydrolase (PAF-AH), a circulating marker of inflammation, is believed to produce various mediators of inflammation. Thus, to evaluate its role in MS, we determined the expression of PAF-AH in MS.

MATERIALS AND METHODS

Patients and healthy controls (n = 15 each) were recruited and diagnosis of MS was made on the basis of National Cholesterol Education Program's Adult Treatment Panel III criteria. The expression of messenger ribonucleic acid (mRNA) in whole blood was evaluated by quantitative polymerase chain reaction using specific primers for PAF-AH; β-2 microglobulin was used as internal control. Relative expression of PAF-AH was analyzed using ΔΔCT method.

RESULTS

The mRNA levels of PAF-AH were found to be higher as compared with controls. The fold change in mRNA expression was 4.8, indicating an increase in expression of PAF-AH in patients with MS.

CONCLUSION

We observed that patients with MS have higher expression of PAF-AH mRNA. Action of lipoprotein-associated phospholipase A2 (Lp-PLA2) on oxidized phospholipids produces lysophophatidylcholine and isopronates, the inflammatory components that participate in the development of atherosclerotic plaque. Therefore, higher risk of atherosclerosis in patients with MS can be attributed to increased expression of Lp-PLA2 in these patients.

Measuring Telomere Length using Real-time PCR in Metabolic Syndrome Subjects Screened from Undergraduate Students

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OBJECTIVE

To measure telomere length and study its association with blood pressure, abdominal circumference, and serum levels of fasting blood sugar, triglycerides and high-density lipoprotein (HDL) cholesterol in metabolic syndrome.

MATERIALS AND METHODS

Undergraduate students were screened for metabolic syndrome and 20 cases and 20 healthy controls were included in the study. A novel monochrome multiplex real-time polymerase chain reaction (PCR) method was used to measure telomere length in peripheral lymphocytes. Anthropometric measurements were made following standard protocol. Blood sugar, serum triglycerides, and HDL cholesterol were measured using kits based on enzymatic methods on autoanalyzer.

RESULTS

The telomere length measured in all the subjects varied from 6.8 to 9.1 kb, and the mean telomere length in 40 subjects was 7.2 kb. The mean telomere length in metabolic syndrome group and control were 7.3 ± 2.7 and 7 ± 1.5 kb respectively. The difference was statistically significant ($p = 0.018$). Significant positive correlation of telomere length was observed with hip circumference ($p = 0.004$), abdominal circumference ($p = 0.01$), and weight ($p = 0.05$).

CONCLUSION

Telomere length may slightly increase in rapidly dividing cells due to reactivation of telomerase. Lymphocytes proliferate rapidly in inflammatory states. Several studies have shown that metabolic syndrome and obesity are associated with inflammation. This could be the reason of increased telomere length in metabolic syndrome group and its positive correlation with obesity parameters seen in our study.

Metabolic Syndrome in Patients with Major Depressive Disorder

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OBJECTIVE

Physical disorders like obesity, hyperlipidemias, hypertension, and type II diabetes mellitus (components of metabolic syndrome) are becoming recognized as significant associated diseases in people with major depressive disorder (MDD). This study was planned to explore metabolic syndrome in major depression.

MATERIALS AND METHODS

The study was conducted in the Department of Biochemistry and Psychiatry, Pt. Bhagwat Dayal Sharma University of Health Sciences, Rohtak. Fifty patients with MDD diagnosed as per International Statistical Classification of Diseases and Related Health Problems (ICD)-10 criteria were taken up for study. Patients were categorized into mild/moderate/severe depression as per ICD-10 criteria. Fifty age- and sex-matched healthy subjects from the general population were taken as controls. Patients with

any other psychiatric comorbidity or any chronic physical illnesses were excluded. Metabolic syndrome was diagnosed as per the International Diabetes Federation criteria.

RESULTS

Study group: 29 male and 21 female patients, mean age 38 ± 9 years. Control group: 26 males and 24 females, mean age 36 ± 8 years. Prevalence of metabolic syndrome was significantly higher ($p < 0.05$, odds ratio – 2.7) in MDD patients (34%) compared with the healthy control group (16%). Prevalence of metabolic syndrome in subjects with mild/moderate and severe depression was 45.45, 11.11 and 36.66% respectively. The mean triglyceride (TG), cholesterol, low-density lipoprotein (LDL), and high-density lipoprotein (HDL) values among MDD patients were higher than their counterparts in healthy control group. Persons suffering from deranged TG, cholesterol, LDL, and HDL among MDD patients were higher than their counterparts in healthy control group.

CONCLUSION

The results suggest higher prevalence of metabolic syndrome in patients with depression and lipid profile to be the most deranged parameter.

Comparison of Insulin Levels in Diabetic *vs* Nondiabetic Stroke Patients

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INTRODUCTION

The increasing prevalence of diabetes makes it one of the most serious health problems in the world, and its role in macrovascular complications, such as stroke is of increasing importance. The presence of diabetes increases the risk of stroke two to fivefold.

AIMS AND OBJECTIVE

To compare insulin levels in diabetic *vs* nondiabetic stroke patients.

MATERIALS AND METHODS

This hospital-based observational and comparative study was conducted in the Department of Biochemistry on 70 diagnosed stroke patients reporting in Department of Medicine, Rajindra Hospital, Patiala Punjab, India. The stroke patients included 40 diabetic and 30 nondiabetics. They were subjected to evaluation of insulin levels, and the statistical analysis was done to assess the insulin levels in diabetic *vs* nondiabetic stroke patients. Venous blood sample was collected, and insulin levels were determined by enzyme-linked immunosorbent assay method.

RESULTS

The mean level of insulin was 17.83 ± 16.29 µIU/Lt in diabetic stroke patients and 14.29 ± 17.36 µIU/Lt in nondiabetic stroke patients. On statistical analysis, the difference was found to be nonsignificant ($p = 0.385$). The normal value of insulin is 0 to 25 µIU/Lt.

CONCLUSION

No significant increase in insulin levels was observed in patients who had suffered stroke whether they were diabetic or non-diabetic. The comparison of the mean insulin levels among diabetic and nondiabetic patients was not significant statistically.

Endocrinology and Bone Metabolism

Clinicobiochemical Profile of Gout

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OBJECTIVE

Gout is a painful condition due to precipitation of monosodium urate crystals in joints. Hyperuricemia can lead to gouty arthritis due to overproduction or underexcretion of uric acid.

MATERIALS AND METHODS

A total of 98 patients (50 males and 48 females) of age group 40 to 68 years were included in the study. Patients were subjected to detailed history and clinical examination.

Radiographs (anteroposterior, lateral, and oblique views) of both feet and hands were taken. Serum uric acid estimation was done before and after treatment.

RESULTS

A total of 74 patients (75.5%) showed first metatarsophalangeal joint involvement; 67 patients (68.3%) complained of acute joint pain at night; 17 males (17.3%) and 19 females (19.3%) had chronic gout; 25 males (25.5%) had history of alcohol intake, and 20 males (20.4%) had history of meat consumption; 39 patients (39.79%) consumed nonvegetarian diet; 37 patients (37.75%) were hypertensive. Tophi were seen in elderly (37 patients, 37.75%) at base of great toe, finger, wrist, and hand. Serum uric acid was 8.03 ± 0.209 mg/dL in males and 6.80 ± 0.173 mg/dL in females. After treatment, values were 6.90 ± 0.176 mg/dL in males and 5.97 ± 0.189 mg/dL in females.

CONCLUSION

Gouty arthritis is commonly seen in middle age group mainly involving great toe with tophaceous deposits in elderly. Attacks were frequent in alcoholic, hypertensive patients and those on high-protein diet. Though patients responded well to treatment, serum uric acid values were toward higher side of reference range after treatment.

Assessing the Risk of Renal Microvascular Involvement in Patients with Type 2 Diabetes Mellitus

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OBJECTIVE

To study the usefulness of various biochemical parameters as a marker of renal microvascular damage in type 2 diabetes mellitus (T2DM) patients. To assess the role of microalbumin in renal microvascular damage in T2DM patients.

MATERIALS AND METHODS

In the present study, 100 individuals were included and divided into three groups, depending on their hemoglobin A1C (HbA1C) levels:

Group I (n = 30) – Normal individuals (HbA1C < 6%)
Group II (n = 34) – Well-controlled T2DM (HbA1C 6–8%)
Group III (n = 36) – Poorly controlled T2DM (HbA1C > 8%),
Parameters were measured by

- Plasma glucose – Glucose Oxidase-Peroxidase method
- Glycated hemoglobin – Latex agglutination inhibition assay
- Urine microalbumin – Immunoturbidimetric method
- Serum Urea – Kinetic method
- Sr. Creatinine – Modified Jaffe's kinetic method
- Serum Uric acid – Uricase phenol-amino- phenazone method
- Estimated glomerular filtration rate (eGFR) – Cockcroft- Gault equation

RESULTS

HbA1C, serum urea, serum creatinine, and serum uric acid in groups II and III were significantly increased, as compared with group I. Microalbumin showed a significant increase in groups II and III than in group I; eGFR was significantly decreased in groups II and III than in group I.

CONCLUSION

"Urinary microalbumin" is the best parameter for assessment of renal microvascular damage in T2DM patients.

Erythrocyte Membrane Na^+–K^+ ATPase Activity in Patients with Type II Diabetes Mellitus

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INTRODUCTION

Diabetes mellitus has been hunting human society since centuries. Even after loads of efforts and attention into the disease, a lot regarding the pathophysiology of the complications of diabetes still remain unclear, which is one of the primary causes of the increasing morbidity and mortality accounted to diabetes mellitus. Na^+–K^+ ATPase is one of the most versatile and vital enzymes present in the plasma membrane of the cells of the body. The activity of this enzyme is important in regulation of the ionic balance of the cell cytoplasm as well as the extracellular environment. Thus Na^+–K^+ ATPase plays a key role in cellular functionality. This study aims at determining the Na^+–K^+ ATPase activity of the red blood cell (RBC) membrane in diabetic patients in comparison with those of the normal individuals.

MATERIALS AND METHODS

The study comprises of two groups: One of patients suffering from diabetes mellitus type II and one normal control; 3 mL of venous blood was drawn from the individuals in ethylenediaminetetraacetic acid tubes. The blood sugar levels, renal function test, and other biochemical parameters were assayed in autoanalyzer. The RBC membrane Na^+–K^+ ATPase activity was measured by combining the methods of Bradford (for protein assay) and of Fiske (for phosphate assay) and expressed in terms of nmol of Pi/µg of protein/hour.

RESULTS

The Na^+–K^+ ATPase activity was found to be significantly lower ($p < 0.01$) in the patients suffering from type II diabetes mellitus in comparison with normal individuals.

CONCLUSION

This study can be further conducted taking into account larger populations, which might prove beneficial in understanding the pathophysiology and devising strategies to combat diabetic complications.

A Study of Serum Glucose in Relation to Serum Uric Acid in Prediabetes, Type II Diabetes Mellitus Patients, and Normoglycemics

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INTRODUCTION

Several epidemiologic studies have reported that high serum uric acid levels are strongly associated with prevalent health conditions, such as obesity, insulin resistance, metabolic syndrome, essential hypertension, and renal disease. There has been a growing interest in the association of hyperuricemia with hyperglycemia. Thus, the study is conducted to investigate the association of serum uric acid with deterioration in glucose metabolism.

OBJECTIVE

To measure serum fasting blood glucose (FBG) and serum uric acid in prediabetics, type II diabetes mellitus (DM) patients, and normoglycemics. To assess the correlation between serum FBG and serum uric acid in the above patients.

MATERIALS AND METHODS

This was a case – control study of 30 prediabetics, 30 type II DM patients of age group 20 to 85 years in Victoria Hospital, attached to Bengaluru Medical College and Research Institute, Bengaluru, and 30 healthy individuals of same age group with no family history of type II DM from general population. Data analysis was done by Pearson's correlation analysis, Chi square test, and Student's t-test.

RESULTS

Mean serum uric acid levels in prediabetics is 6.903 ± 0.42 mg/dL; type II DM is 2.97 ± 1.01 mg/dL; and in normoglycemics is 3.5 ± 0.54 mg/dL respectively. There is a positive correlation of FBG and uric acid in prediabetes and a negative correlation in type II DM, and both are statistically significant ($p < 0.00001$). In normoglycemics, uric acid shows a positive correlation, which is statistically insignificant ($p = 0.424$).

CONCLUSION

Fasting serum uric acid levels were higher in prediabetic population but lower in people with diabetes than in normoglycemic people. Therefore, uric acid may serve as the potential biomarker of deterioration in glucose metabolism.

Protective Role and Therapeutic Potential of Thymoquinone in Diabetic Patients

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OBJECTIVE

To assess the protective role of thymoquinone on status oxidative stress parameters in sera of diabetic patients.

MATERIALS AND METHODS

The study was conducted in type II diabetic patients. Fasting venous blood samples for estimation of malondialdehyde (MDA), protein carbonyls, ferric-reducing ability of plasma (FRAP), and glutathione content were drawn after informed consent. Normal healthy sera were obtained from age- and sex-matched healthy individuals. They were incubated with thymoquinone for 21 days. Sera of healthy individuals without any treatment served as control. All blood samples were collected in plain vials and left for clot formation. Serum was separated and stored in small aliquots at –20°C.

RESULTS

There was an appreciable augmentation in MDA and protein carbonyl content levels in diabetic patients' sera. Diabetic sera incubated with thymoquinone showed a significant level of decrease in MDA and protein carbonyl levels as compared with diabetic sera without any treatment; FRAP-values and glutathione (GSH) content were found decreased significantly in diabetic patients as compared with controls. Treatment of diabetic samples with thymoquinone showed a significant increase in FRAP-values and GSH content.

CONCLUSION

The present study provides evidence for the strong antioxidant effect of thymoquinone in serum from diabetic patients. This could be attributed to their ability of scavenging reactive oxygen species. Furthermore, this is suggestive of having a protective role in diabetic patients.

A Study on Antioxidant Effect of Eugenol in Diabetic Patients

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OBJECTIVE

To evaluate the serum level of lipid peroxides, protein carbonyls, total antioxidant capacity, and glutathione (GSH) content in healthy and diabetic patients. The protective effect of eugenol on these parameters was also determined.

MATERIALS AND METHODS

Diabetic serum samples were collected after informed consent under all aseptic precautions. They were incubated in the absence and presence of eugenol and analyzed for malondialdehyde (MDA), protein carbonyls, GSH levels, and ferric-reducing ability of plasma (FRAP) values.

RESULTS

Samples from diabetic patients had been found to possess significantly higher serum levels of MDA and protein carbonyls than healthy subjects. Also, there was a decrease in GSH content and FRAP-values in diabetic patients as compared with controls.

On incubation with eugenol, the MDA and carbonyl content decrease up to a certain extent in diabetic patients. Treatment of diabetic samples with the phytochemical also resulted in a significant increment in FRAP-value and GSH content. This could be attributed to their ability of scavenging reactive oxygen species.

CONCLUSION

Protection provided by eugenol is a convincing reason for the possibility of using this phytochemical as an adjunct in the treatment of diabetes.

Clinical Relevance of Hypomagnesemia in Type II Diabetes Mellitus

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OBJECTIVE

Global burden of type II diabetes mellitus (DM) is rising. People are at greater risk of diabetes due to improper dietary practice and lack of physical exercise. The condition is characterized by established decreased insulin secretion and action. Decreased magnesium levels may worsen insulin sensitivity and insulin action. Routinely, this biochemical alteration in type II diabetics is not addressed by the physicians. This comparative study was planned in diabetic patients and healthy subjects to draw the attention on this issue and to focus on the pathophysiological effect of hypomagnesemia.

MATERIALS AND METHODS

This cross-sectional study was conducted on 50 patients with type II DM and 50 healthy subjects who were age and sex matched. Fasting blood sugar and serum magnesium were estimated spectrophotometrically by end point method.

RESULTS

The results were compared and analyzed by Student's t-test. Significant decrease was seen in magnesium level in type II diabetics than control subjects (1.39 *vs* 1.85 mg/dL), ranging from 1.2 to 1.8 mg/dL *vs* 1.6 to 2.3 mg/dL in diabetics and controls respectively.

CONCLUSION

The association of hypomagnesemia in type II diabetes may be relevant in understanding the development of the disease, its prevention, and the associated complications.

Can Serum Cystatin C Predict Early Cardiovascular Disease in Type II Diabetes Patients?

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OBJECTIVE

Cardiovascular disease (CVD) is one of the common complications of diabetes mellitus. Serum cystatin C level has been suggested as a marker for cardiac complications in diabetes. The utility of serum cystatin C in diabetic patients without CVD needs further study, particularly in the developing world where CVD is increasing.

We studied serum cystatin C level in diabetics for any association between cardiac complications and elevated cystatin C levels.

MATERIALS AND METHODS

In the present study, 88 subjects (35–60 years of age) were included; 58 patients had type II diabetes (28 with CVD and 30 with no CVD). The control group was 30 healthy adults. Patients with cancer, pregnancy, neurological disorders, nephropathy, and those who were smokers or on glucocorticoid therapy were excluded. Cardiac complications were identified by echocardiography and angiography. Fasting samples were collected and serum cystatin C analyzed by enzyme-linked immunosorbent assay. Estimation of fasting blood glucose, serum creatinine, total cholesterol, high-density lipoprotein cholesterol, and triglycerides was done on automated chemistry analyzer and glycated hemoglobin by high-performance liquid chromatograph method. Continuous variables were presented as mean±standard deviation. Statistical analysis was performed using Statistical Package for the Social Sciences version 16.0.

RESULTS

Significant difference was observed between serum cystatin C levels in diabetic patients with cardiac complications (2.5 ± 0.85), diabetic patients without cardiac complications (1.8 ± 0.6), and healthy subjects (0.8 ± 0.2). Serum cystatin C levels were not correlated with number of affected vessels.

CONCLUSION

Cystatin C levels were significantly different between healthy and diabetic patients, and may be serum cystatin C concentrations can be measured as a potential early marker for subclinical CVD in diabetes.

Relationship of Serum Leptin and Body Mass Index in Patients with Gestational Diabetes Mellitus

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OBJECTIVE

Pregnancy simulates diabetes-like condition in which insulin resistance starts to appear from midpregnancy along with the changes in body weight and energy homeostasis. Leptin, apart from playing a major role in energy metabolism, also regulates fetal growth and development. So, this study was planned to evaluate maternal serum leptin levels and its correlation with body mass index (BMI) in gestational diabetes mellitus (GDM) patients.

MATERIALS AND METHODS

This was a one-time cross-sectional study conducted in the Department of Biochemistry in collaboration with the Department of Obstetrics and Gynaecology, Pt. Bhagwat Dayal Sharma, Post Graduate Institute of Medical Sciences, Rohtak. Thirty healthy pregnant females and 30 age- and gestation (28–32 weeks)-matched females with singleton pregnancy, newly diagnosed with GDM satisfying the inclusion and exclusion criteria were included in the study. Serum leptin was analyzed by enzyme-linked immunosorbent assay and BMI was calculated using anthropometric measurements in both the groups.

RESULTS

Mean serum leptin was significantly higher ($p < 0.001$) in GDM patients (30.0 ± 5.98 ng/mL) than in control group (20.30 ± 4.48 ng/mL), and mean values of BMI were also found to be significantly higher ($p < 0.001$) in GDM patients (26.20 ± 3.74 kg/m^2) as compared with controls (24.17 ± 3.72 kg/m^2).

CONCLUSION

Our study showed that serum leptin levels were raised in GDM patients, and a significant positive correlation was seen between serum leptin and BMI ($r = 0.414$, $p = 0.023$). This suggests that increased body fat may be one of the contributing factors for elevating serum leptin in GDM patients as leptin is mainly produced by white adipose tissue.

Endocrinopathies in Thalassemia Major Patients on Chelation Therapy

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AIM

Beta-thalassemia major is a hereditary haemoglobin disorder resulting in severe anemia. These patients require life-long blood transfusion with frequent iron chelation therapy to combat iron overload in vulnerable organs. Despite these advances, the patients are still prone to endocrine complications affecting their quality of life.

OBJECTIVE

To evaluate the presence of endocrinopathies – thyroid functions, anterior pituitary hormones, and gonadal functions in thalassemia major patients and to assess their association with serum ferritin levels.

MATERIALS AND METHODS

The study population included 100 beta-thalassemia major patients above 10 years of age with a mean age of 14.0 ± 2.1 years, attending thalassemia clinic in Lady Hardinge Medical College and associated hospital. The medical records of these patients

were reviewed and their endocrine functions documented. Data analysis was done using Statistical Package for the Social Sciences statistical software.

RESULTS

Hypothyroidism was present in 20% of the patients, out of which 55% had overt while 45% had subclinical hypothyroidism. Hypogonadism was noted in 42% patients, out of which 83.3% had hypogonadotrophic and 16.7% had normogonadotrophic hypogonadism; 10% had both thyroid and gonadal dysfunction. A significant difference ($p < 0.0001$) in mean serum ferritin was found in patients with and without endocrinopathy.

CONCLUSION

There is high prevalence of endocrinal complications among thalassemic patients, which signifies the importance of therapeutic intervention and frequent follow-up for early detection of complications.

Serum Magnesium and Lipid Profile in Type II Diabetics: A Case – Control Study

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OBJECTIVE

Magnesium (Mg) is the 2nd most common intracellular cation. It is a fundamental cofactor for many enzymatic reactions in glucose metabolism and insulin homeostasis. Magnesium deficiency can alter the activity of membrane-bound Na^+-K^+ ATPase, which is involved in maintenance of glucose transport.

AIM

The aim of the study was to assess serum Mg and lipid profile levels in diabetics in comparison with healthy controls.

MATERIALS AND METHODS

It is a prospective case – control study of 86 subjects (50 diabetics, 36 healthy controls) between 25 and 80 years. Complete history and body mass index (BMI) were recorded. Glycosylated hemoglobin (HbA1c), fasting blood sugar (FBS), lipid profile, Mg, and creatinine clearance were estimated. Student's t-test was performed; p-value < 0.05 is taken as significant.

RESULTS

Mean duration of diabetes in cases was 10 ± 8 years; BMI, creatinine, and HbA1c showed statistically significant increase in cases as compared with controls. With regard to lipid profile, only triglyceride (mg/dL) (169 ± 17 *vs* 116.9 ± 12; $p = 0.02$) and total cholesterol/high-density lipoprotein ratio (3.93 ± 0.1 *vs* 3.26 ± 0.2; $p = 0.04$) showed significant increase and Mg (mmol/L) (0.78 ± 0.04 *vs* 0.97 ± 0.03; $p = 0.001$) showed statistically significant decrease in cases compared with controls.

CONCLUSION

Our study showed decreased Mg levels and altered lipid metabolism in diabetics in comparison with controls. Magnesium deficiency leads to dyslipidemia in diabetics due to defects in enzymes like lipoprotein lipase, pyrophosphatase, etc. Insulin resistance and Mg depletion result in a vicious cycle of worsening insulin resistance and decrease in intracellular Mg, which limits its role in vital cellular processes. So, it is prudent to monitor Mg routinely in diabetics and treat the condition whenever possible.

Serum Leptin Level is Reduced in Obese Women with Type II Diabetes

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OBJECTIVE

The study aimed to evaluate variation in serum leptin levels in obese women with type II diabetes mellitus.

MATERIALS AND METHODS

We studied 40 obese women with type II diabetes mellitus and 40 obese women without type II diabetes mellitus. Fasting blood sugar, glycated hemoglobin, serum creatinine, fasting lipid profile, serum leptin were measured by standard methods. Body mass index (BMI), waist circumference, and waist-to-hip ratio were measured.

RESULTS

The serum leptin level in type II diabetic obese women (20.64 ± 5.64) was significantly lower than that in obese women without type II diabetes mellitus (29.14 ± 6.81). Serum leptin levels correlate positively with BMI in both the groups, but more significantly with the diabetic groups.

CONCLUSION

It is seen that lower serum leptin levels in diabetic patients may be due to altered fat distribution in diabetes. Leptin being secreted by subcutaneous fat, in diabetes, visceral fat is increased compared with subcutaneous fat.

Microalbuminuria: Reflector of Glycemic Control in Diabetes Mellitus

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INTRODUCTION

Early detection of diabetic nephropathy is difficult by the fact that much of the important diabetic renal injuries can occur in absolute clinical silence. The relative mortality in diabetics with proteinuria is higher than in diabetics without proteinuria. Poor glycemic control increases the risk of microalbuminuria. This study was conducted to compare the frequency of microalbuminuria in three glycemic groups of type II diabetics who are on treatment for various durations of time. Patients were divided into three groups according to their baseline glycated hemoglobin (HbA1c): ≤7.4%, 7.5 to 8.9, and ≥9.0%, reflecting good, moderate, and poor glycemic control respectively. Data on age, gender, and duration of diabetes were recorded. Urine and blood samples were analyzed for microalbuminuria (immunoturbidimetry) and HbA1c (high-performance liquid chromatograph method by D-10). Patients with other causes of proteinuria were excluded. Out of 851 cases, 451 (53%) were male and 400 (47%) were female. Mean age of patients was 54.9 ± 13.1, 57.7 ± 14.7, and 54.4 ± 0.6 years, and average duration of diabetes was 5.2, 8.2 and 11.8 years respectively, in the three groups. Mean HbA1c levels and microalbuminuria were 6.6% and 45; 8.2% and 99; and 10.4% and 176 mg/g creatinine. The difference in microalbumin was statistically significant between the groups. Frequency of microalbuminuria in these three groups of patients was 28, 47 and 63% respectively. Our study explicitly indicates the high prevalence of microalbuminuria in diabetics and that the impaired glycemic control is associated with significant elevations in urinary microalbumin levels. This advocates the need for therapeutic and preventive measures from clinicians, diabetic associations, and the Ministry of Health.

Study of Thyroid Status, Autoimmunity, and Lipid Profile in Perimenopausal Women

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OBJECTIVE

To estimate thyroid profile – total triiodothyronine (T_3), total thyroxine (T_4), thyroid-stimulating hormone, and anti-thyroid peroxidase antibodies (TPO), in perimenopausal women and to calculate menopausal rating scale (MRS) score for each subject and finally to study the proportion of thyroid disorders and anti-TPO in perimenopausal age when divided according to MRS score.

Perimenopause or menopausal transition is the period of females' life when hormonal changes and clinical symptoms occur. Many symptoms of perimenopause may be mistaken for thyroid-related symptoms, which may lead to misdiagnosis. Hypothyroidism is a known common risk factor for obesity and hyperlipidemia. If the thyroid status goes undetected and uncared, the risk of consequences will become manifold.

MATERIALS AND METHODS

The study was conducted with 148 women, between 47 and 53 years of age fulfilling inclusion and exclusion criterion. Perimenopausal age and thyroid status were taken in account through MRS and thyroid questionnaire. Body mass index and waist circumference were taken. Thyroid profile, anti-TPO, and lipid profile were estimated for each one of them. Results were noted and analyzed.

RESULTS

In this study, out of 148 women screened, 22 were found to have subclinical hypothyroidism (SH) and 8 clinical hypothyroidism (CH). Out of 73 women having MRS score >8, 28 (38.35%) had SH or CH, and out of 75 women with MRS score <8, 2 (2.66%) had SH or CH. Euthyroid subjects having higher MRS score were found to have anti-TPO antibodies positive.

CONCLUSION

Prevalence of hypothyroidism is more in perimenopausal age group. Though women with high MRS are more likely to suffer from SH and CH, low score does not rule out this possibility. Screening should be done in this age group to prevent complications of hypothyroidism.

Relationship between Serum Vitamin D and Insulin Resistance in Prediabetic and Diabetic States

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OBJECTIVE

(1) To compare serum 25-hydroxy vitamin D levels between nondiabetic, prediabetic, and type II diabetic subjects. (2) To study the relationship between insulin resistance and vitamin D status among individuals with prediabetes and diabetes.

MATERIALS AND METHODS

It was a hospital-based cross-sectional study including age- and sex-matched 150 subjects who were divided into 50 nondiabetics, 50 prediabetics, and 50 type II diabetics. Height, weight, and waist and hip circumference were measured. Waist hip ratio and body mass index were calculated. Fasting blood sugar, insulin, lipid profile, calcium, alkaline phosphatase and serum 25-hydroxy vitamin D were estimated in all subjects. Glucose tolerance test was done in all nondiabetic subjects. Insulin resistance [homeostatic model assessment (HOMA2)-IR] and beta cell function (HOMA2-β) were calculated using HOMA2 calculator.

RESULTS

Vitamin D deficiency (20 ng/mL) was seen in 20% normals, 36% of prediabetics, and 48% of diabetics. Body mass index, waist-to-hip ratio, total cholesterol, triglycerides, low-density lipoprotein and very low-density lipoprotein were significantly increased and high-density lipoprotein decreased in prediabetic and diabetic groups when compared with normals ($p < 0.001$). 25-Hydroxy vitamin D levels were significantly decreased ($p < 0.001$) in diabetics as compared with normals and prediabetics ($p = 0.02$). Insulin resistance (HOMA2-IR) was significantly raised in diabetics as compared with normals. There was a strong negative correlation between vitamin D and HOMA2-IR in diabetics ($r = –0.48$) and prediabetics ($r = –0.4$).

CONCLUSION

Vitamin D deficiency is common in prediabetic state, and subjects having severe vitamin D deficiency (< 10 ng/mL) had the worst insulin resistance. Our study results help in proposing vitamin D levels as an early marker for diabetes and help in recommending vitamin D to be prescribed in the prediabetic stage itself.

Association of Resistin Gene Polymorphism –420 (C/G), Serum Resistin, and Ischemic Stroke in Type II Diabetes Mellitus Patients

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OBJECTIVE

Among type II diabetics with same level of exposure to risk factors, only selected diabetics develop ischemic stroke. Thus, there could be genetic association for the susceptibility of diabetics to ischemic stroke. The polymorphism of G allele instead of C allele at –420 of promoter region of RETN gene increases the serum resistin levels. Thus, the objective is to find the association between the resistin gene polymorphism –420C/G (rs1862513) serum resistin and ischemic stroke in type II diabetes mellitus patients.

MATERIALS AND METHODS

A total of 60 type II diabetics with and without ischemic stroke and 60 apparently healthy controls were selected. Polymerase chain reaction was done. Resistin gene (RETN) –420C/G polymorphism was detected with BbsI restriction endonuclease. Serum resistin was estimated by enzyme-linked immunosorbent assay.

RESULTS

Odds ratio of G allele between diabetics with and without ischemic stroke was found to be 4.04 at 95% confidence interval of (1.62–10.02). Serum resistin levels were significantly more in diabetics with ischemic stroke (39.5 ± 21.2 ng/mL) compared with

diabetics without ischemic stroke (25.9 ± 13.69 ng/mL) and controls (21 ± 9.58 ng/mL) at $p < 0.001$. Serum resistin levels were significantly increased among G+ individuals compared with G– individuals at $p < 0.001$. Receiver operating characteristic curve was plotted to find the resistin cutoff level between diabetics with and without ischemic stroke. Cutoff level of resistin was found to be at 30.85 ng/mL with 75% specificity and 65% sensitivity.

CONCLUSION

There is a significant association of –420C/G polymorphism of RETN gene with serum resistin levels and susceptibility of diabetics to ischemic stroke. Serum resistin levels and if possible genotyping of –420C/G of RETN gene can be used to assess the risk of susceptibility of diabetics to ischemic stroke.

A Study to Evaluate Serum Amylase and Lipase Activity in Patients with Type II Diabetes Mellitus

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OBJECTIVE

To compare serum amylase and lipase activity of diabetic patients with that of normal healthy controls. To correlate serum amylase and lipase activity with fasting blood glucose levels in diabetic patients.

MATERIALS AND METHODS

A total of 75 diagnosed patients with type II diabetes mellitus, attending the Diabetic Clinic in Assam Medical College and Hospital, Dibrugarh, were included as cases; 50 age- and sex-matched healthy volunteers were enrolled as controls. Fasting venous blood samples were collected. Quantitative estimations of fasting blood glucose (Hexokinase method), serum amylase (AMY method), and serum lipase (LIPL method) were carried out in Siemens Dimension RxL Autoanalyzer in ACBL of the Department of Biochemistry. Results were analyzed using standard statistical tests.

RESULTS

Fasting blood glucose levels and serum lipase activity are significantly higher ($p < 0.0001$ and $p < 0.05$ respectively) and serum amylase activity significantly lower ($p < 0.0001$) in cases as compared with controls. While lipase activity correlates significantly positively ($p < 0.0001$; $r = 0.6173$) with fasting blood glucose levels in the diabetic patients, serum amylase activity shows negative correlation, though not statistically significant.

CONCLUSION

Significant decrease in serum amylase activity and increase in serum lipase activity in type II diabetes patients indicates a supposed interplay between the endocrine and the exocrine functions of the pancreas, which may be attributed to their anatomical vicinity. Larger trials of longer duration estimating pancreatic enzymes in type II diabetes with other relevant parameters could provide additional information on metabolic control, which is essential in planning management and preventing complications.

To Study the Thyroid Status in Type II Diabetes Mellitus and its Possible Relation with Hyperglycemia, Obesity and Dyslipidemia

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OBJECTIVE

Patients with diabetes mellitus may be at an increased risk of thyroid disease, and further thyroid abnormalities can have adverse effect of metabolic control, dyslipidemia, and cardiovascular risk. Poor glycemic control can produce features similar to hyperthyroidism, such as weight loss despite increased appetite and fatigue.

The study was designed to know the prevalence of thyroid abnormalities in type II diabetes patients and compare with age/sex-matched healthy controls and to correlate thyroid status with body mass index (BMI), dyslipidemia, and glycosylated hemoglobin (HbA1c) levels.

MATERIALS AND METHODS

The study was conducted in the Department of Biochemistry, BPS Government Medical College for Women, Khanpur, Sonepat, in collaboration with Department of Medicine. Hundred confirmed cases of type II diabetes mellitus in the age group of

30 to 75 years attending or admitted to the Department of Medicine were taken into study. Hundred healthy age/sex-matched individuals were taken as control.

RESULTS

Prevalence of abnormal thyroid profile was 19%. Subclinical hypothyroidism was observed to be the most common thyroid abnormality (47.4%), followed by subclinical hyperthyroidism (31.6%) and hypothyroidism (21.1%). In diabetics, there was significant negative correlation of total triiodothyronine (T3) and total thyroxine (T4) with BMI ($p = 0.001$, 0.025) and positive correlation between thyroid-stimulating hormone (TSH) and HbA1c ($p = 0.006$); TSH correlated significantly with triglycerides ($r = +0.266$, $p = 0.007$), and high-density lipoprotein cholesterol ($r = –0.245$, $p = 0.015$). The T3 and T4 correlated with triglycerides ($r = –0.277$, $p = 0.005$ and $r = –0.262$, $p = 0.008$).

CONCLUSION

Abnormal thyroid hormone levels in diabetes may cause poor control of sugar and lipid levels in some treated diabetics. Thyroid profile should be investigated in type II diabetics, particularly in those patients whose conditions are difficult to manage.

Serum Leptin Levels in Impaired Glucose Tolerance and Recent-onset Diabetes, Relationship with Anthropometry and Lipid Profile

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OBJECTIVE

Leptin is mainly produced in adipose tissue and has an important role in metabolic homeostasis, neuroendocrine and immune functions, and glucose, lipid, and bone metabolism. Role of leptin resistance/increased levels within India is not much studied in prediabetic men and women in comparison with recent-onset type II diabetes mellitus. Aim of the study is to measure serum leptin levels in correlation with anthropometry and lipid profile in prediabetes and nondiabetic and diabetic men and women.

MATERIALS AND METHODS

A cross-sectional study was carried out in a total of 45 subjects: 20 prediabetes subjects, 20 diabetic subjects and 5 nondiabetic subjects. The study was done in rural South India with 23 women and 22 men. Anthropometry, fasting lipid profile, and fasting leptin levels were measured.

RESULTS

Data analyses were carried out by using the Statistical Package for the Social Sciences version 23.0. Kolmogorov-Smirnov test was performed to test continuous variables for normality. Independent Student's t-test was used to compare means between groups of normally distributed data; p-values < 0.05 were considered significant.

Leptin values increased with increased body mass index ($r – 0.59$), waist-to-hip ratio, and high-density lipoprotein in both prediabetes and diabetes men and women (p-value 0.000 to 0.009). With increased total cholesterol and low-density lipoprotein (LDL), leptin values increased in both groups of women (p-value 0.001–0.004). In diabetic men, impaired leptin values showed strong association with triglycerides (p-value 0.005–0.016).

CONCLUSION

There is strong association between anthropometry and leptin resistance in both impaired and diabetic groups. In women, both groups well correlated with total cholesterol and LDL.

Study of Correlation of Mean Platelet Volume with Fasting Blood Glucose and Lipid Profile in Type II Diabetes Mellitus

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OBJECTIVE

Diabetes mellitus is a major global health problem, and it is characterized by chronic hyperglycemia, metabolic, cellular and blood disturbances leading to vascular abnormalities. Mean platelet volume is an indicator of average size and activity of platelets. Increased platelet activity may play a role in development of vascular complications of this metabolic disorder.

Objective of our study is to correlate mean platelet volume with fasting blood glucose, lipid profile in patients with type II diabetes mellitus, and normal healthy controls.

MATERIALS AND METHODS

This case – control study was conducted at Shri VN Govt. Medical College, Yavatmal. Study group comprises of 100 cases of type II diabetes mellitus and 100 age- and sex-matched healthy individuals.

The samples were tested for mean platelet volume on cell counter machine and fasting blood glucose and lipid profile on Trivitron Nanolab 240 autoanalyzer.

Statistical evaluation was performed by Statistical Package for the Social Sciences using Student's t-test and Pearson correlation tests.

RESULTS

In this study, elevated values of mean platelet volume, fasting plasma glucose, and lipid profile have been found in cases of type II diabetes mellitus as compared with controls.

Statistically significant correlation was seen between mean platelet volume, fasting blood glucose, and lipid profile in patients with type II diabetes mellitus.

CONCLUSION

Being simple, quick, and easily assayable tool to pick up early vascular complications, mean platelet volume can be used to aid in better patient care in type II diabetes mellitus.

Comparative Study of Fasting and Postprandial Apolipoprotein B over Traditional Lipid Parameters in Type II Diabetes Mellitus

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OBJECTIVE

Type II diabetes mellitus (DM) is characterized by relative insulin deficiency or insulin resistance is associated with glucose intolerance, hypertension, a unique dyslipidemia, and an increase in macrovascular and microvascular disease. The present study was conducted to assess the significance of postprandial apolipoprotein B (Apo-B) over fasting Apo-B and traditional lipid parameters for cardiovascular disease risk in type II DM.

MATERIALS AND METHODS

The study includes 50 diagnosed cases of type II DM and 50 age- and sex-matched healthy subjects as controls in age group 34 to 65 years. In both the groups, we have measured serum levels of traditional lipid parameters comprising of total cholesterol (TC), triglyceride (TG), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), Apo-B both in fasting and postprandial states. Statistical analysis was done by Student's unpaired t-test and linear regression analysis and correlation.

RESULTS

The study shows significant increased level of serum postprandial TC, TG, LDL-C, very low-density lipoprotein cholesterol, and Apo-B in type II DM patients as compared with fasting as well as controls, while serum HDL-C level was significantly lower in type II DM patients as compared with controls.

CONCLUSION

Findings of the study indicated that postprandial Apo-B is significantly elevated as compared with fasting Apo-B in type II DM patients and controls and significant over routine lipid parameters. Hence, estimation of postprandial Apo-B, in addition to fasting and traditional lipid parameters, is necessary in the cardiovascular risks assessment in type II DM.

Association of Vitamin D Levels and Cognitive Function in Postmenopausal Women

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OBJECTIVE

To study the association of 25-hydroxy vitamin D [25(OH)D] levels with markers of cognitive impairment, i.e., Mini-Mental State Examination (MMSE) and Addenbrooke's cognitive examination – Revised (ACE-R) score in postmenopausal women.

MATERIALS AND METHODS

A cross-sectional study was conducted on 30 postmenopausal women and 30 premenopausal women as controls. All the study subjects were analyzed for 25(OH)D levels by enzyme-linked immunosorbent assay, and cognitive function was assessed by using the MMSE and ACE-R score. Appropriate statistical analysis was done.

RESULTS

Serum 25(OH)D levels (22.3 ± 13.58 ng/mL *vs* 32.4 ± 12.4 ng/mL) in postmenopausal women were significantly lower (p-value = 0.03) when compared with premenopausal women. A significant positive correlation was found between the 25(OH)D levels and the markers of cognitive decline, i.e., MMSE (r = 0.40) and ACE-R score (r = 0.61) in postmenopausal women. Even though the vitamin D levels in premenopausal women were higher than postmenopausal women, a significant proportion (60%) had vitamin D inadequacy.

CONCLUSION

Vitamin D deficiency is a major health concern in India, especially in elderly individuals, and is adversely associated with neurocognitive function. A significantly lower 25(OH)D levels, MMSE, and ACE-R scores were observed in postmenopausal women when compared with premenopausal women; 25(OH)D levels were significantly associated with markers of cognitive decline. These results suggest a potential role of vitamin D in cognitive dysfunction in postmenopausal women and can be considered as an early marker for cognitive decline.

Serum Uric Acid Levels in Type II Diabetic Nephropathy

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OBJECTIVE

To estimate and compare the levels of serum uric acid in type II diabetic patients with nephropathy and type II diabetic patients without nephropathy.

MATERIALS AND METHODS

Institutional Ethics Committee's permission was taken and 50 patients of age group of 18 to 65 years of type II diabetes with nephropathy (group I) and 50 patients of type II diabetes without nephropathy (group II) were enrolled using inclusion and exclusion criteria. Informed consent was taken before enrolment. Fasting, postprandial blood glucose, serum creatinine, urine albumin, and serum uric acid were estimated.

RESULTS

The mean age group in group I was 59 ± 11.48 S.D. and group II was 56.2 ± 9.28 S.D. The serum uric acid level in group I was 8.7 ± 2.46 S.D. and in group II was 5.5 ± 1.68 S.D. The serum uric acid levels were compared using unpaired t-test by using GraphPad statistics software version 5.03. The levels of uric acid were higher and statistically significant ($p < 0.0001$) in group I as compared with group II. The serum creatinine levels in group I was 7.67 ± 3.62 S.D. and in group II was 1.2 ± 0.77 S.D. There was positive correlation of serum uric acid with serum creatinine (r = 0.8) and urine albumin (r = 0.7) in group I.

CONCLUSION

The increase in serum uric acid was higher in type II diabetic patients with nephropathy that indicates that serum uric acid can be an important parameter in prognosis of patients with diabetic nephropathy.

Homocysteine Thiolactonase Activity of Paraoxonase 1 is an Independent Risk Factor for Diabetic Retinopathy

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OBJECTIVE

The objective of the present study is to investigate the role of paraoxonase 1 (PON1) homocysteine thiolactonase activity, Q192R polymorphism, and to investigate the role of protein peroxidation by serum levels of advanced oxidation protein products (AOPP) and myeloperoxidase (MPO).

MATERIALS AND METHODS

A total of 40 patients with diabetic retinopathy and 40 healthy individuals were taken from our hospital. Phenotyping was done by using ratio of enzyme activities using phenylacetate and p-nitrophenyl acetate. The MPO was determined as described by Andrew et al, AOPP by Witko-Sarsat et al, and homocysteine thiolactonase by Marsillach et al.

RESULTS

Homocysteine thiolactonase, MPO, and AOPP were significantly different in cases and controls. Homocysteine thiolactonase activity was negatively correlated with MPO, and AOPP was significantly correlated with MPO. The PON1 phenotypic studies show trimodal distribution of phenotypes. Significant difference was found for phenotypic distribution by chi-square test (p-value = 0.006). Logistic regression analysis model shows that all the three parameters are better predictors of the disease.

CONCLUSION

Homocysteine thiolactonase has a protective role as an antioxidant and anti-inflammatory in causation of diabetic retinopathy. PON1 R allele is more susceptible to diabetic retinopathy; PON1 Q allele plays a protective role in the causation of the disease. Homocysteine thiolactonase along with MPO and AOPP are better predictors of diabetic retinopathy.

To Screen Prediabetics among Healthy Young Adults from 18 to 30 Years' Age Group and to Find Their Correlation with Lipid Profile and Anthropometric Measurements

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OBJECTIVE

To screen prediabetics among healthy young adults from 18 to 30 years' age group and to find their correlation with lipid profile and anthropometric measurements.

MATERIALS AND METHODS

Estimation of fasting blood sugar (FBS) and blood glucose 2 hours after 75 gm of glucose load (glucose oxidase-peroxidase method), glycosylated hemoglobin (HbA1c; ion exchange resin method), lipid profile (cholesterol oxidase/phenol + aminophenazone method), and risk factors for diabetes like waist circumference, body mass index (BMI), and family history of diabetes mellitus.

RESULTS

110 subjects (50 male and 60 females) were studied and 31.82% had prediabetes, with male preponderance (44% of males and 21.67% of females); 15.45% had impaired fasting glucose, 11.82% had impaired glucose tolerance, and 28.18% had HbA1c in prediabetes range. About 45.45% of the total subjects had family history, 22.73% had increased BMI, 11.82% had increased waist circumference, 31.82% had total cholesterol >155 mg/dL, 22.27% had low-density lipoprotein (LDL) >100 mg/dL, 9.09% had triglycerides (TGL) >150 mg/dL, and 79.09% had decreased high-density lipoprotein (HDL <40 mg/dL in males and <47 mg/dL in females). The HbA1c was positively correlated with TGL and total cholesterol and negatively with BMI, waist circumference, LDL, and HDL. Blood glucose 2-hour postglucose load was positively correlated with waist circumference ($p < 0.05$), BMI ($p < 0.01$), total cholesterol ($p < 0.01$), and LDL ($p < 0.01$) TGL ($p > 0.05$), FBS positively correlated with BMI, waist circumference, total cholesterol, LDL cholesterol and TGL negatively correlated with HDL.

CONCLUSION

It was concluded that prediabetes is correlated with lipid profile, waist circumference, BMI, and family history. Since 6 to 10% of prediabetes with impaired glucose tolerance progresses to diabetes each year, early identification and intervention should be made. Lifestyle modification, weight reduction, and treatment of hyperglycemia and hyperlipidemia can prevent the onset of diabetes.

To Study the Role of Phenytoin Therapy on Thyroid-stimulating Hormone in Patients with Epilepsy

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OBJECTIVE

Patients with epilepsy need long-term treatment with antiepileptic drugs, which may lead to an alteration in thyroid status. There are contradictory reports in the literature regarding this. Therefore, this study was planned to assess thyroid-stimulating hormone (TSH) in epilepsy patients on phenytoin monotherapy, and a correlation of phenytoin levels with TSH was also assessed.

MATERIALS AND METHODS

The present study was conducted on 30 epilepsy patients receiving phenytoin (300 mg/day). Serum samples were analyzed for phenytoin levels using high-performance liquid chromatography and TSH levels using chemiluminescence technique after 6 months of therapy, while TSH levels were also estimated before starting the treatment. The results were statistically analyzed and compared.

RESULTS

At the time of diagnosis, all the patients had TSH within the normal range (2.04 ± 0.63 µmol/L), while at 6 months of therapy the TSH levels were found to be higher (2.34 ± 1.25 µmol/L) though not statistically significant. Out of 30 patients, 9 patients had phenytoin levels in the toxic range and their TSH levels were 3.46 ± 1.59 µmol/L, 8 patients had subtherapeutic phenytoin levels with TSH levels 1.63 ± 0.90 µmol/L. Rest of the patients had phenytoin levels in the therapeutic range with TSH level of 2.01 ± 0.45 µmol/L. The alteration in different groups was statistically significant. A positive correlation was found between serum phenytoin and TSH levels.

CONCLUSION

Thyroid status is affected by serum phenytoin levels. Therefore, regular monitoring of serum levels of phenytoin and TSH is warranted to detect an alteration at an early stage and for timely intervention.

Determination of Microalbuminuria and HbA1c in Type II Diabetes Mellitus

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OBJECTIVE

Nephropathy is a complication of type II diabetes mellitus that may lead to end-stage renal disease. Persistent microalbuminuria is the best predictor of developing diabetic nephropathy. The correlation between HbA1c and microalbuminuria with the duration of diabetes is not clear. The objective of this study is to determine microalbuminuria levels in type II diabetics and to correlate changes in microalbuminuria levels to HbA1c level and duration of diabetes.

MATERIALS AND METHODS

The study was conducted at Hi-Tech Medical College & Hospital, Bhubaneswar Odisha, India. A total of 50 type II diabetics of age group 30 to 60 years without any complications were taken as cases and 50 healthy subjects of comparable age were taken as controls. Cases with anemia, other diseases, people on drugs that could affect HbA1c levels and microalbuminuria were excluded. Fasting and postprandial blood glucose and HbA1c were analyzed. Urine was analyzed for microalbuminuria.

RESULTS

Urinary microalbumin and HbA1c levels were significantly higher in the cases. Microalbumin levels were linearly correlated to the duration of diabetes and HbA1c.

CONCLUSION

Impaired glycemic control is associated with significant elevations in urinary microalbumin levels. Furthermore, there is an increased urinary microalbumin with increased duration of diabetes, suggesting that the detection of increased urinary microalbumin levels at the initial stage can avert and reduce the burden of diabetic complications in the future.

Assessment of Hypogonadism with Reference to Clinical Features and Serum Testosterone Levels in Indian Male Type II Diabetic Patients attending Diabetic Clinic

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INTRODUCTION

Testosterone is the principal sex hormone in men. It is important not only for normal sexual function but also for maintaining bone and muscle strength, mental and physical energy, and overall well-being. Low testosterone is associated with diminished libido, erectile dysfunction, increased fat mass, decreased muscle, bone mass and energy, depression, and anemia. Type II diabetes mellitus (T2DM) may be one of the commonest causes of hypogonadism – a lack of function in the testes, which adversely affects testosterone production.

OBJECTIVE

To estimate serum testosterone levels, follicle-stimulating hormone, and luteinizing hormone in T2DM.

To correlate the serum testosterone levels with clinical hypogonadism.

To correlate the serum testosterone levels with other variables like age, duration of diabetes, smoking, body mass index (BMI), waist circumference, blood pressure, and haemoglobin A1C levels.

MATERIALS AND METHODS

In the cross-sectional study, 50 diabetic patients of 30 to 76 years age group preferably without chronic illness were taken. A detailed history of present illness was recorded including duration of the onset of symptoms. Past history and family history for hypertension and DM and history of chronic medications use were asked. Personal history like smoking and alcohol consumption was also noted. Complete Androgen Deficiency in Aging Males questionnaire was asked for clinical assessment of hypogonadism. A detailed clinical examination including height, weight, BMI, waist circumference, blood pressure, and systemic examination was done, and all relevant investigations were sent. Appropriate statistical methods were applied.

RESULTS

Awaited.

Study of Lipid Profile in Metabolic Syndrome among Diabetics and Nondiabetics

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OBJECTIVE

The aim of this study was to evaluate changes in lipid profile levels in metabolic syndrome among diabetics and nondiabetics.

MATERIALS AND METHODS

A total of 100 patients (50 cases and 50 controls) were selected randomly for a 1-year study. A total of 50 cases aged > 35 years were selected from Government General Hospital, Kurnool, with exclusion criteria (hepatic, renal, cardiac impairment and gestational diabetes mellitus and who are on insulin therapy). All parameters (lipid profile and fasting blood sugar [FBS]) were done on a semiautomated analyzer (Transasia – ERBA Chem 5X).

RESULTS

Study shows the comparison of the statistical data of lipid profile (mg/dL) of cases and controls. The mean and standard deviation of serum total cholesterol, triglycerides, very low-density lipoprotein cholesterol, low-density lipoprotein cholesterol (LDL-C), triglyceride/high-density lipoprotein (HDL), total cholesterol/HDL are highly increased in cases compared with the controls,

and HDL cholesterol levels of cases were found to be lower than controls. The mean values of FBS for diabetics were quite high compared with those of nondiabetics. The p-value observed for all the parameters is < 0.0001 and is considered highly significant.

CONCLUSION

Atherogenic dyslipidemia and central obesity are constant observations in the present study, and efforts are to be made to lower the LDL, the primary injurious agent in atherogenesis.

Sunshine Hormone and Thyroid Hormone Interplay: A Pilot Study

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OBJECTIVE

Vitamin D, the sunshine hormone, is involved in physiology of all body cells and so is thyroid hormone. Both might be interlinked at some stage as many evidences suggest so. Few speculations are made regarding the conversion of total thyroxine (T4) to total triiodothyronine (T3) using vitamin D. Studies show that thyroid hormone inhibits 25 hydroxy [25(OH)D] 1alpha hydroxylase and also vitamin D suppresses thyroid-stimulating hormone (TSH) secretion and exerts direct effects on thyroid cells, such as inhibition of iodine uptake. Furthermore, thyroid hormone receptors belong to the nuclear receptor superfamily, which also includes the receptors for vitamin D. So, polymorphisms in the vitamin D receptor gene have been associated with autoimmune thyroid disease. There is a complex interplay between thyroid hormones and vitamin D, which needs further clarification.

MATERIALS AND METHODS

A retrograde study of 35 cases was done in the biochemistry lab of Netaji Subhash Chandra Bose Subharti Medical College whose vitamin D and thyroid profile was requested together.

RESULTS

There was a significant positive correlation of 25(OH) D with free total triiodothyronine (fT3) levels ($r = 0.22$, $p < 0.5$) as well as free total thyroxine (fT4) levels ($r = 0.4056$, $p < 0.05$) and a significant negative correlation with TSH ($r = –0.15$, $p < 0.5$).

CONCLUSION

There is definitely a direct relationship of vitamin D levels with thyroid hormones, which is confirmed by the indirect relation with TSH levels as per this preliminary study. Vitamin D-related fT4 to fT3 conversion is, however, not evident.

Study of Serum Creatine Phosphokinase in Thyroid Disorders

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INTRODUCTION

Thyroid disorder is a common problem that can cause symptoms because of over- or underfunction of thyroid gland. Musculoskeletal system often accompanies thyroid dysfunction. Serum creatine kinase can be used as diagnostic aid in progressive muscular dystrophy. These disorders are common in hypothyroidism and also observed in thyrotoxicosis. The thyroid hormone itself is related to the regulation of proliferation and maturation of myocytes. When in excess, it increases the time of mitosis and striated muscle interval required for cell division. Therefore, thyroid hormones may be cause for consequent reduction of muscle mass and the amount of creatine phosphokinase (CPK).

AIMS AND OBJECTIVES

To estimate and analyze serum CPK levels in thyroid diseases compared with controls. To study relationship between serum CPK with thyroid-stimulating hormone (TSH) levels in thyroid disorder cases.

MATERIALS AND METHODS

The present study was conducted on 40 thyroid disease patients (hypothyroidism 20 cases; hyperthyroidism 20 cases) in the central lab of the Department of Biochemistry, Kakinada, and compared with 40 healthy, age- and sex-matched controls. Blood samples were collected and analyzed: Total triiodothyronine (T3), total thyroxine (T4), and TSH levels by chemiluminescence method and CPK by modified International Federation of Clinical Chemistry method.

RESULTS

The present study shows that in hypothyroidism patients, CPK statistically significantly increases with significant increase in TSH levels and decrease in T3 and T4, whereas CPK levels are significantly lower in hyperthyroid patients with significant increase in T3, T4 and decrease in TSH levels when compared with controls.

CONCLUSION

Serum CPK levels show direct relationship with TSH levels. Thus, serum CPK may be used as a screening tool for thyroid disorders; systemic symptoms are minimal or absent.

A Case—control Study of Thyroid Profile in Type II Diabetes Mellitus

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OBJECTIVE

The aim of the present study was to assess the frequency of thyroid dysfunction among patients with type II diabetes mellitus and to find the relationship between these two endocrine disorders.

MATERIALS AND METHODS

A total of 100 subjects (male and female) aged between 30 and 70 years including 50 patients with type II DM attending an outpatient department and medical wards in Maharaja Yashwant Rao Hospital, Indore, and 50 age- and sex-matched healthy controls fulfilling the inclusion criteria were chosen for the study. Each patient was investigated for fasting plasma glucose (FPG), thyroid-stimulating hormone (TSH), total triiodothyronine (T3) and total thyroxine (T4).

RESULTS

The levels of T3 and T4 were significantly lower, while the TSH level was significantly higher in type II diabetics as compared with nondiabetics. From the 50 diabetic subjects studied, 28% shows abnormal thyroid hormone levels (23% had hypothyroidism and 5% had hyperthyroidism), whereas in 50 nondiabetic subjects, only 3% of the subjects had abnormal thyroid dysfunction. Females (38%) had high incidence of thyroid disorders compared with males (22%).

CONCLUSION

The prevalence of thyroid dysfunction among type II DM patients is very high (28%), with subclinical hypothyroidism being the most common and frequent in female patients. To reduce the morbidity rate, patients with type II DM should be screened for thyroid dysfunction.

Evaluation of Plasma D-dimer in Type II Diabetes Mellitus

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OBJECTIVE

Evaluation of plasma levels of D-dimer in type II diabetes patients and to find a relation of D-dimer in the progression of disease in these patients.

MATERIALS AND METHODS

A case – control study will be conducted on 50 type II diabetes patients and 30 healthy age- and sex-matched controls. Blood samples of all the study subjects will be analyzed for D-dimer by Nyco card reader, fibrinogen by coagulation analyzer based on Clauss method, haemoglobin A1c by Nyco card reader, and total cholesterol by enzymatic method.

DISCUSSION

Diabetes mellitus represents a powerful independent risk factor for increased cardiovascular mortality associated with coronary artery disease (CAD). Coronary artery disease in diabetic patients is mainly due to an imbalance of thrombotic and fibrinolytic system as well as augmented inflammation. Fibrin degradation products (FDPs) generated from an interaction between plasmin and fibrin have been considered as one of the determinants for future risk of diabetic vascular complications. Several studies

indicated that elevated plasma levels of D-dimer FDPs have been observed in the progression of diabetes mellitus. It has been used as an indicator of the procoagulant state and considered as a risk factor for coronary artery thrombosis. In the present study, we are expecting elevated plasma D-dimer in diabetic patients. It may predict the future risk of having vascular complications like CADs in diabetic patients.

Pseudohypoparathyroidism Presenting as Seizure: A Rare Case Report

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INTRODUCTION

Pseudohypoparathyroidism (PHP) is a heterogeneous group of disorders characterized by variable insensitivity to parathyroid hormone (PTH). We describe a case of a 22-year-old male who has typical clinical features of Albright's hereditary osteodystrophy (AHO). Laboratory investigations revealed evidence of PHP and skeletal survey showed shortening of the metacarpals and metatarsals.

CASE REPORT

A 22-year-old male presented to the medical emergency room with three episodes of generalized tonic-clonic seizures. He had similar episodes of on/off carpopedal spasms and intermittent calf muscle cramps for last 1 year. On physical examination, vitals were stable. Skeletal examination revealed round face, short right metacarpals and bilateral small distal phalanx of thumb with short left metatarsal and right second toe. He had subcutaneous hard mobile masses in lateral aspect of right arm and right leg. Chvostek and Trousseau signs were positive. Systemic examination was normal.

Laboratory investigations revealed decreased serum calcium, increased serum phosphate, elevated serum parathyroid hormone, and decreased vitamin D levels. Thyroid profile showed elevated thyroid-stimulating hormone levels with normal antithyroperoxidase antibody levels. Electrocardiogram showed prolonged QTc interval.

CONCLUSION

The PHP is an uncommon sporadic or inherited genetic disorder. There can be resistance to many peptide hormones that use the alpha subunit of stimulatory G protein to enhance cyclic adenosine monophosphate production. Patients with PHP 1a and 1c are usually associated with AHO. The elevated serum concentration of PTH in a patient with chronic hypocalcemia, hyperphosphatemia, and normal renal function excludes hypoparathyroidism and chronic renal failure, hence, suggesting the presence of PHP.

A Comparative Study of Vitamin D and Serum Total Calcium Levels in Two Socioeconomic Groups in Guwahati Metropolitan City

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OBJECTIVE

Vitamin D is not strictly a vitamin, since it can be synthesized in the skin. Under normal circumstances, 80 to 90% of Vitamin D is synthesized in the skin, and dietary sources contribute to 10 to 20% of the total Vitamin D pool. Vitamin D deficiency as well as excess is both known to cause disease. The objective of the study was to analyze the levels of Vitamin D and total calcium in two different socioeconomic populations in Guwahati city to observe to what extent lifestyle influences the respective levels.

MATERIALS AND METHODS

The participants were divided into two equal groups. The Office staff constituted the Office Group and daily wage earners constituted the Wage Earner Group. Vitamin D estimation was done by enzyme-linked immunosorbent assay (ELISA) using 25-OH Vitamin D ELISA kit obtained from Euroimmun Medizinische Labordiagnostika, Germany. Estimation of total serum calcium was done by spectrophotometry using the Vitros 5600 Integrated system autoanalyzer.

RESULTS

Both Vitamin D and total calcium levels were found to be statistically less in the Office Group (Vitamin D 15.42 ng/mL, calcium 8.835 mg/dL) as compared with the Wage Earner Group (Vitamin D 46.67 ng/mL, calcium 9.868 mg/dL). Females irrespective of the group were found to have statistically lower levels of Vitamin D and total calcium as compared with males (females, Vitamin D 27.52 ng/mL, calcium 9.26 mg/dL *vs* males, Vitamin D 32.56 ng/mL, calcium 11.55 mg/dL).

CONCLUSION

From the study, it can be surmised that Vitamin D and calcium supplementation are necessary to combat deficiency in the population, particularly for females.

Study of Inflammatory Markers and Tumor Necrosis Factor α 308 Gene (G/A) Polymorphism in Gestational Diabetes Mellitus

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INTRODUCTION

Gestational Diabetes Mellitus (GDM) is a disease with multifactorial etiology. Recent studies have implicated inflammation as a possible cause. Hence, the present study was planned to evaluate the role of proinflammatory cytokine tumor necrosis factor (TNF)-α and its polymorphism and transcription factor nuclear factor (NF)-κB levels in GDM.

MATERIALS AND METHODS

The study included 30 diagnosed cases of GDM and 30 healthy pregnant women as controls. Samples were collected after overnight fast for routine investigations and estimation of TNF-α and NF-κB. By enzyme-linked immunosorbent assay genomic deoxyribonucleic acid was extracted from whole blood and TNF-α 308 G/A gene polymorphism was studied by polymerase chain reaction – restriction fragment length polymorphism.

RESULTS

Serum TNF-α levels were significantly higher in cases as compared with controls ($p = 0.034$). However, no significant difference was found in the genotype frequency among cases and controls. The NF-κB levels were higher among the cases. However, the difference was not statistically significant.

CONCLUSION

Higher TNF-α level among the cases indicates the role of TNF-α in the etiopathogenesis of GDM. It probably acts by inducing insulin resistance through serine phosphorylation of insulin receptor substrate, which inhibits its tyrosine kinase autophosphorylation activity. The NF-κB was higher in cases, which emphasizes its role in inflammation-induced insulin resistance associated with GDM. There was no significant difference in the frequency of distribution of genotypes, which reiterates the multifactorial etiology of GDM.

Ischemia-modified Albumin in Hypothyroidism

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OBJECTIVE

Ischemia-modified albumin (IMA) is closely related with oxidative stress. Hypothyroidism is the state of increased oxidative stress. The role of IMA in thyroid dysfunction is controversial. The present study aimed to investigate the level of IMA in newly diagnosed hypothyroid subjects.

MATERIALS AND METHODS

A total of 56 age- and sex-matched subjects participated in this study: 28 subjects in hypothyroid group and 28 subjects in euthyroid group. Thyroid-stimulating hormone, free total triiodothyronine (T3), and free total thyroxine (T4) were assessed using standard enzyme-linked immunosorbent assay kit. The IMA level was assessed colorimetrically by an albumin binding assay developed by Bar-or et al, which involves binding capacity of albumin for cobalt(II) metal ion.

RESULTS

Serum level of IMA was found to be considerably low in subjects with hypothyroidism as compared with euthyroid subjects (0.09 ± 0.07 *vs* 0.34 ± 4.57). Though this value is statistically not significant (p-value = 0.78), it hints to a very important observation that level of IMA is considerably decreased in hypothyroid subjects.

CONCLUSION

As all the hypothyroid subjects recruited for the study were newly diagnosed, lower level of IMA can be used as an important early marker of hypothyroidism.

Prevalence of Hypothyroidism: A Hospital-based Study

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OBJECTIVE

Hypothyroidism is deficiency in thyroid hormone secretion and action that produces a variety of clinical signs and symptoms of hypometabolism. This common disorder occurs in 2 to 15% of the population, more commonly in women than in men. The risk of developing hypothyroidism increases with age. The aim of this study was to assess the prevalence of hypothyroidism among patients admitted in the Osmania General Hospital, Hyderabad.

MATERIALS AND METHODS

This study was a hospital-based observational study carried out on 200 patients, admitted for different medical conditions. They were divided into two groups based on sex, group I (male = 100) and group II (female = 100). Serum total triiodothyronine (T_3), total thyroxine (T_4), and thyroid-stimulating hormone (TSH) levels were estimated using chemiluminescence immunoassay technique.

RESULTS

In group I, mean ± standard deviation (SD) of T_3 was 0.97 ± 0.15, T_4 was 8.95 ± 1.36, and TSH was 3.46 ± 1.53. In the group II Mean ± SD of T_3 was 1.07 ± 0.36), T_4 was 8.11 ± 2.63 and TSH was 4.42 ± 2.89. The T_3, T_4, and TSH were statistically significant (p-value < 0.05) in female patients than in males. This study showed increased cases of hypothyroidism among in-patients admitted, with female preponderance.

CONCLUSION

Higher prevalence of hypothyroidism was observed in female patients when compared with male patients. The findings also support the usefulness of screening of thyroid function for early detection and treatment to minimize the complications of thyroid dysfunctions in general. Thus, females should be screened for thyroid function routinely to prevent complications due to hypothyroidism.

Association between hsCRP and HbA1c in Patients with Type II Diabetes Mellitus

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OBJECTIVE

It is considered that hyperglycemia is an inflammatory condition. Among several markers of inflammation, high-sensitivity C-reactive protein (hsCRP) was found to be significant in people with diabetes. So we conducted this study to find the association between hsCRP and haemoglobin A1c (HbA1c) levels in type II diabetics.

MATERIALS AND METHODS

This is a retrospective study of 70 (male = 42, female = 28) type II diabetic patients in Nizam's Institute of Medical Sciences hospital from April 2015 to August 2015. Data of subjects were divided into two groups based on their HbA1c levels: HbA1c < 7% well controlled (group I) and > 7% poorly controlled (group II); hsCRP was compared between two groups. Student's t-test and Pearson correlation were performed; p-value < 0.05 was considered significant.

RESULTS

Median (interquartile range) for hsCRP in group I is 1.5 mg/L (0.1–7.6) and for group II poorly controlled group is 6.2 mg/L (1.3–118). We found a statistical significant difference for hsCRP between two groups (p = 0.0008). We also found a positive correlation between hsCRP and HbA1c.

CONCLUSION

In conclusion, the combined occurrence of elevated HbA1c, indicating hyperglycemia and elevated hsCRP, indicating low-level inflammation, shows the importance of determination of hsCRP in type II diabetes mellitus patients. Insights gained from the link between inflammation and hyperglycemia can yield predictive and prognostic information for further management of patients.

Vit D Deficiency in North Indian Females with Hypothyroidism

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OBJECTIVE

Hypothyroidism is a prevalent disease in North Indian females. Thyroid hormone and vit D act through similar receptors, but the effect of vit D levels on hypothyroidism is not widely reported. So, we planned to assess vit D, calcium, and parathyroid hormone (PTH) levels in North Indian females.

MATERIALS AND METHODS

A case – control study was performed in 90 females with hypothyroidism. Vitamin D levels were assayed using enzyme-linked immunosorbent assay kit, serum Ca levels were measured using autoanalyzer, PTH levels were measured using chemiluminescence, and results were compared with 90 age-matched healthy controls.

RESULTS

Vitamin D levels and Ca levels were significantly low and serum PTH hormone levels were significantly high in cases as compared with controls. Results were compared using t-test and analysis of variance ($p = 0.000$). Area under receiver operating characteristic curve was >0.7 for vitamin D and PTH. Regression analysis showed that vit D and PTH levels had high significance ($p = 0.000$), which suggests that decrease in vit D levels or increase in PTH levels have significant impact on occurrence of hypothyroidism.

CONCLUSION

We recommend screening of vit D and PTH levels in females with hypothyroidism. Vitamin D supplementation may be helpful in reducing the severity of hypothyroidism, but further studies using vit D supplementation are required to prove this fact.

Study of Vitamin D Deficiency in North Indian Anemic Patients

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OBJECTIVE

To examine the association of serum 25 hydroxyvitamin D [25(OH)D] levels with haemoglobin levels and anemia status in North Indian population.

MATERIALS AND METHODS

We included 70 anemic patients and 70 controls. Anemia was defined according to the World Health Organization criteria; 25(OH) D was measured using enzyme-linked immunosorbent assay.

RESULTS

We found that 84.3% (59/70) of anemic patients (median hemoglobin 8.9 g/dL) and 30% (21/70) of controls (median hemoglobin 13.3 g/dL) exhibited 25(OH)D deficiency (<20 ng/mL). The prevalence of 25(OH)D deficiency was significantly higher in the anemic group (<12 ng/mL) than in the control group (>12 ng/mL) ($p < 0.0001$), with an odds ratio of 12.52 (95% confidence interval, 5.5–28.47; $p < 0.0001$). The prevalence of 25(OH)D deficiency was not different among anemia subtypes. Female gender was more associated with vitamin D deficiency in anemic group.

CONCLUSION

This study demonstrates that vitamin D deficiency is associated with anemia. Therefore, the measurement of serum 25(OH)D levels and appropriate vitamin D supplementation should be considered in anemic patients, particularly in females.

Vitamin D Status, as Observed in a Tertiary Care Hospital in Ludhiana

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OBJECTIVE

Vitamin D, a fat-soluble vitamin, is closely linked with human health and is produced in body from skin irradiation to sun and from diet. Serum 25-hydroxy [(25)OH] Vitamin D is a marker of Vitamin D status. Deviations on either side of the normal have been associated with a number of health issues including diabetes, cancer, hypertension, cardiovascular, obesity, musculoskeletal, bone, and dental problems. Aim of the study was to review the levels of Vitamin D and have a database based on age and gender of patients attending a tertiary care hospital in Ludhiana.

MATERIALS AND METHODS

The retrospective observational study was done by retrieving the data of (25)OH Vitamin D levels over a period of 1 year from August 1, 2014, to July 31, 2015. The samples requested had been processed by electrochemiluminescence immunoassay method using an automated clinical chemistry analyzer (Cobas E-411; Roche Diagnostics) in the Biochemistry laboratory of CMC, Ludhiana.

RESULTS

The data retrieved were analyzed in terms of age and gender and categorized into insufficiency (≤20 ng/mL), deficiency (21–29 ng/mL), and sufficiency (≥30 ng/mL) of vitamin D (Hollick MF, Ann Epidemiol 2009 Feb;19(2):73-78). The number of females reporting for Vitamin D assay was more than males, but more percentage of males were found to be 25(OH) Vitamin D deficient.

CONCLUSION

Vitamin D inadequacy is not widely recognized as a problem, and more data should be collected and a generalized registry needs to be started at national level, so as to develop more correlation with chronic disorders and also to have preventive measures through national-level programs.

Correlation between Fluoride and Bone Turnover Markers – Calcium, Phosphorus, and Alkaline Phosphatase in Postmenopausal Women

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OBJECTIVE

The aim of the present study was to correlate the serum bone turnover markers –calcium, phosphorus, and alkaline phosphatase with the serum levels of fluoride in apparently healthy postmenopausal women.

MATERIALS AND METHODS

A total of 75 apparently healthy postmenopausal (45–55 years) women were selected for the study. Serum calcium, inorganic phosphorus, and alkaline phosphatase were measured by fully automated autoanalyzer using standard kit methods. Serum fluoride levels were measured by ion-selective electrode method. Student's t-test and Pearson's test of correlation were used for the statistical analysis.

RESULTS

There were no significant changes in bone turnover markers during period of 45 to 55 years. Serum fluoride level was normal (0.025 ppm), lower in postmenopausal women. Fluoride concentration had nonsignificant positive correlation ($p > 0.05$) with calcium, inorganic phosphorus, and alkaline phosphatase.

CONCLUSION

Menopause leads to changes in bone turnover marker. Serum levels of fluoride and bone turnover markers have a role in assessment of fluorosis in menopause because higher intake of fluoride will result in skeletal fluorosis and nonskeletal manifestations of high fluoride level, thereby affecting collagen synthesis and bone mineralization.

Estimate Levels of Testosterone in Patients with Central Serous Choroidoretinopathy

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OBJECTIVE

Central serous choroidoretinopathy (CSCR), a condition encountered frequently by the ophthalmologist, is characterized by an exudative neurosensory retinal detachment and is found predominantly in males. Hence, this study was conducted to evaluate the potential role of testosterone as a causative factor in the development of CSCR.

MATERIALS AND METHODS

This study was carried out in the Department of Biochemistry in collaboration with the Department of Ophthalmology, Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak; 25 newly diagnosed patients with CSCR in the age group 30 to 50 years, presenting in the eye outpatient department, were selected for the study. Their serum was analyzed for testosterone level by chemiluminescence on ADVIA CENTAUR CP by the kits procured from Siemens (USA). The levels were compared with the available normal reference value of testosterone on the same machine.

RESULTS

The mean testosterone levels in patients with CSCR were found to be 620.39 ng/dL as compared with the mean levels found in controls, which was 519.34 ng/dL.

CONCLUSION

Testosterone may have a role in the etiopathogenesis of CSCR. The androgen receptors have been identified in the mammalian choroid, and androgens are known to mediate blood flow and epithelial ion transport. Also, the incidence of CSCR decreases as age advances, which correlates with the gradual decline in the total plasma testosterone levels with advancing age. This correlation may be consolidated if further studies are carried out with a larger sample size.

Effect of *Ocimum sanctum* on Serum Concentration in Thyroid Hormones in Rabbits

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OBJECTIVE

The present study was undertaken to evaluate the effect of *Ocimum sanctum* on serum concentration of thyroid hormones in rabbits.

MATERIALS AND METHODS

Rabbits were divided into two groups of 10 each. Group I (Control): Standard chow diet. Group II (Test): Maintained on same diet which control group rabbits received along with supplementation of 2 gm fresh leaves of *O. sanctum* orally/day for 30 days. After 30 days, serum concentration of thyroid [total triiodothyronine (T_3), total thyroxine (T_4), thyroid-stimulating hormone (TSH)] hormones was done from both groups.

RESULTS

In the rabbits receiving *O. sanctum*, marked increase in the levels of T_3 and T_4 was observed, whereas TSH levels were significantly reduced.

CONCLUSION

Ocimum sanctum can be used for stimulation of thyroid functions for regulation of hypothyroidism.

Cancer

Study of Immunophenotype of Various Leukemias and Correlation among Them

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OBJECTIVE

To elucidate the immunophenotype of various leukemias and characterize the correlation among them.

MATERIALS AND METHODS

Study included all subjects diagnosed with leukemia in from January 1, 2014, to August 2015. Bone marrow/peripheral blood immunophenotypes of patients diagnosed with leukemia in Pt. Jawahar Lal Nehru Memorial Medical College were studied. CD10, CD34, CD19, CD7, CD117, CD33, CD5, human leukocyte antigen – antigen D related, CD13, and various other parameters were assessed using flow cytometry and were correlated with FAB subtypes.

RESULTS

Total 65 subjects were diagnosed with leukemia, of which 22 were excluded as per selection criteria; 43 subjects were included in the study; 15 (35%) subjects were diagnosed to be suffering from B-cell acute lymphocytic leukemia (ALL), 12 (28%) from T-cell ALL, 11 (25.5) from acute myeloid leukemia, and rest 5 (11.5) from other leukemia. There was significantly different distribution in frequencies of CD5 ($p = 0.001$), CD117 ($p = 0.01$), CD19 ($p = 0.01$) and CD10 ($p = 0.01$) amongst four groups while frequency distribution was not found to be significantly different for CD7 ($p = 0.3$), CD33 ($p = 0.9$), HLA Dr ($p = 0.5$), CD13 ($p = 0.09$) and CD34 ($p = 0.6$).

CONCLUSION

Distribution of various CD surface markers significantly varies between different leukemias. This variation must be given proper attention while interpreting result of immunohistochemistry.

A Study of Serum Adenosine Deaminase, Lactate Dehydrogenase, and Gamma Glutamyl Transferase Activity in Carcinoma Breast

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OBJECTIVE

To measure and compare serum adenosine deaminase (ADA), lactate dehydrogenase (LDH), and gamma glutamyl transferase (GGT) activity in clinically established and histopathologically confirmed cases of carcinoma breast with age-matched healthy controls and to find correlation between activities of serum ADA, LDH, and GGT in breast cancer cases.

MATERIALS AND METHODS

This study was carried out in the Department of Surgery in collaboration with the Department of Pathology, and laboratory investigations were carried out in the Department of Biochemistry, Advanced Clinical Biochemistry Laboratory, Assam Medical College and Hospital, Dibrugarh, from June 2014 to June 2015. Total 50 cases of breast cancer and 50 age-matched healthy controls were enrolled for study; 5 mL sample collected in SEV. Serum ADA, LDH, and GGT activity was measured in semiautoanalyzer by colorimetric method.

RESULTS

On comparing the activities of ADA, GGT, and LDH in breast cancer with healthy controls the p-value was < 0.0001, which was highly statistically significant. In patients with breast cancer, ADA showed a positive correlation with GGT ($p < 0.0001$), which was highly statistically significant; GGT showed a positive correlation with LDH ($p < 0.0001$), which was highly statistically significant. Also ADA showed a positive correlation with LDH ($p < 0.0001$), which was highly statistically significant.

CONCLUSION

From this study, we can conclude that elevation of these enzymes in carcinoma breast signifies their importance as markers of the disease. A serial measurement of these enzymes will help in early detection of the disease.

Variation of Neutrophil to Lymphocyte Ratio with Serum Vitamin D Status in Cancer Patients: Is It Clinically Relevant?

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OBJECTIVE

A high neutrophil to lymphocyte ratio (NLR), a marker of inflammation, has been shown to be associated with adverse outcomes in malignant diseases. Hypovitaminosis D may cause an elevated NLR by exacerbation of inflammation. This study aims to document the influence of serum 25-hydroxy-vitamin D (25OHD) status on NLR as an inflammatory marker in cancer patients as Indian data are sparse.

MATERIALS AND METHODS

Retrospective analysis was done for 2014 to 15; 25OHD was analyzed by a commercially available chemiluminescent assay and its levels were studied according to 25OHD status and cancer types. Patients with 25OHD supplementation were excluded from the study. Statistical analysis was performed on the association of 25OHD levels and NLR.

RESULTS

Out of 82 patients, 65.8% were deficient in 25OHD. Mean NLR in deficient group (<50 nmol/L) was 5.4 [standard deviation (SD) = 7.7], in insufficient group (50<74 nmol/L) was 4 (SD = 2.1), and in the sufficient group (74–250 nmol/L) was 3.4 (SD = 2.5). The mean 25OHD in gastrointestinal cancers was significantly lower than that of hematological cancers (40.3 *vs* 53.15 nmol/L; p-value = 0.03). The mean value of NLR in gastrointestinal patients was higher as compared with the hematological patients (3.78 *vs* 2.76; p-value = 0.3). No correlation, however, was observed in vitamin D with NLR across various categories.

CONCLUSION

A decreasing gradient of NLR from vitamin D deficient to sufficient states was demonstrated in this study. We also showed that NLR varied according to the two most common type of cancer being treated at our institute.

A Study of the Role of Serum Prostate-specific Antigen as a Diagnostic Tumor Marker in Female Patients with Malignant Breast Tumors

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OBJECTIVE

Breast carcinoma has emerged as one of the most common malignancies among females, requiring early detection, for the overall achievement of best results after treatment, with minimal morbidity and mortality. For this purpose, a wide variety of molecular-based prognostic factors and tumor markers like carcinoembryonic antigen, cancer antigen 15.3 etc. have been studied but with very limited diagnostic sensitivity. Herein comes the role of serum prostate-specific antigen (PSA), which is being evaluated for its diagnostic and prognostic efficacy in recent times. The objective of this study is to assess whether serum PSA level (total, free, and free:total ratio) estimation maybe a diagnostic tool in diagnosing malignant breast disease.

MATERIALS AND METHODS

As a hospital-based cross-sectional study, the serum levels of total PSA and free PSA are measured by enzyme-linked immunosorbent assay method in 20 female patients with diagnosed breast carcinoma and 20 healthy age- and sex-matched individuals.

RESULTS

Student t-test done by Statistical Package for the Social Sciences Software has shown significant difference of free PSA levels between cases and control groups (p = 0.006), cases showing higher values (2.37 ± 0.71 *vs* 1.91 ± 0.13). But for total PSA, there was no significant difference (p = 0.33) between the two groups (3.21 ± 0.62 *vs* 3.41 ± 0.63). The ratio of free to total PSA between the groups (73.36 ± 15.5 *vs* 62.07 ± 11.15) was also highly significant (p = 0.012).

CONCLUSION

The study shows that free PSA level can be used as a diagnostic marker for malignant breast diseases, although further study with a larger population is needed.

Study of Promoter Hypermethylation of GADD45G Gene in Chronic Myeloid Leukemia Patients

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OBJECTIVE

To detect GADD45G gene promoter hypermethylation in chronic myeloid leukemia (CML) patients and healthy subjects and compare results of GADD45G gene promoter hypermethylation in CML patients and healthy subjects. To find out the association of GADD45G gene promoter hypermethylation with clinical phases (chronic, accelerated, and blast crisis).

MATERIALS AND METHODS

The study was carried out in 30 cases of CML which includes 10 patients with each phase of CML (chronic phase, accelerated phase, blast crisis) patients and 30 healthy subjects as controls. Methylation status of GADD45G gene was evaluated by methylation-specific polymerase chain reaction.

RESULTS

Frequency of promoter hypermethylation of GADD45G gene in whole blood of CML patients was 40%. We observed statistically significant difference in methylation status of genes in whole blood deoxyribonucleic acid with cases (30 CML patients) and controls (30 healthy controls) (p-value < 0.0001 by Fisher exact test for both genes). We found that there is significant association between methylation status of $P16^{(INK4a)}$ with clinical stages of CML patients (p-value = 0.03 by Fisher exact test).

CONCLUSION

Promoter methylation seems to be an important mechanism of GADD45G gene inactivation in CML patients.

Utility of Serum Total Prostate-specific Antigen and Free Prostate-specific Antigen in the Diagnosis of Breast Tumors

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OBJECTIVE

Data on the role of serum tumor markers in diagnosing breast tumors is very limited. Currently available serum tumor markers cannot be used for diagnosing breast tumors because of their low sensitivity. In this background, present study was taken up to assess the utility of serum total prostate-specific antigen (TPSA) and serum free prostate-specific antigen (FPSA) in combination with serum carcinoembryonic antigen (CEA) and cancer antigen (CA)15-3 in diagnosing breast tumors.

MATERIALS AND METHODS

Seventy-two female patients including 38 benign breast disease cases and 34 malignant breast cases with histologically confirmed diagnosis of primary breast tumors were included; 5 mL of venous blood was collected after an overnight fast. Another blood sample was collected 1 week after surgery. Serum TPSA, FPSA, CEA, and CA15-3 were measured by enzyme-linked immunosorbent assay using commercially available kits. Statistical analysis was performed using Statistical Package for the Social Sciences version 11.5.

RESULTS

Patients with malignant breast tumors had significantly higher levels of serum TPSA, FPSA, CEA, and CA15-3 before surgery compared with patients with benign breast tumors. A significant decrease was seen in serum TPSA and CEA levels after surgery in patients with malignant breast tumors. Serum TPSA had a greater area under the curve (AUC = 0.913) compared with CEA and CA15-3 (AUC = 0.866 and 0.677 respectively), suggesting it to have a better diagnostic utility compared with CEA and CA15-3.

CONCLUSION

Findings of present study suggest that serum TPSA can be used as a diagnostic marker to differentiate benign breast disease from malignant tumors compared with the currently used markers CEA and CA15-3, which exhibit lesser sensitivity and specificity.

To Evaluate and Compare the Impact of Conventional *vs* Altered Fractionated Chemoradiotherapy on Renal Function in Locally Advanced Head and Neck Cancer Patients

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OBJECTIVE

To analyze and compare the effect of accelerated fractionated concomitant chemoradiation and conventional fractionated concomitant chemoradiation (CRT) in locally advanced head and neck squamous cell cancer (LAHNSCC) patients' renal function test.

MATERIALS AND METHODS

The present prospective, open label, parallel and randomized study was conducted on 40 patients with LAHNSCC (stage III and IV) in department of radiotherapy, Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences Rohtak, Haryana, India from December 2013 to August 2015. These patients were divided into two groups, group I and II of 20 patients each.
Group I: These patients were given accelerated fractionated CRT (66Gy/33 fraction/5.3 weeks/6 fraction/week, and weekly inj. cisplatin 30 mg/$m^2 \times 6$)
Group II: These patients were given conventional CRT (66 Gy/33 fraction/6.3 weeks/5 fraction/week, and weekly inj. cisplatin 30 mg/$m^2 \times 6$)

Renal function test (Blood urea, serum creatinine) was done weekly during CRT and toxicity is assessed as per World Health Organization toxicity criteria.

RESULTS

In group I, blood urea and serum creatinine toxicity in grade 0, I, and II were seen in 12 (60%), 6 (30%), 2 (10%) and in 14 (70%), 5 (25%) and 1 (5%) respectively. In group II, blood urea and serum creatinine toxicity in grade 0, I, and II were seen in 15 (75%), 5 (25%), and 0 (0%) and in 16 (80%), 4 (20%), and 0 (0%) respectively. None of the patients experienced grade III and IV renal toxicity in both the groups.

CONCLUSION

It is observed that both the schedules were tolerated well, although the group receiving CART has more nephrotoxic effect as compared with conventional chemoradiation.

An Alteration in Serum Lipid Profile and Prostate-specific Antigen Levels in Benign Breast Disease: A Comparative Study

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INTRODUCTION

Benign breast diseases constitute a heterogeneous group of lesions including developmental abnormalities, inflammatory lesions, epithelial and stromal proliferations, and neoplasms. The incidence of benign breast lesions begins to rise during the second decade of life and peaks in the 4th and 5th decades. Diet and obesity are important factors that have been extensively shown to be related to its increased risk. With the availability of highly sensitive immunoassays, it has become apparent that prostate-specific antigen (PSA) is expressed in nonprostatic tissues, most prominently in breast tissue.

AIMS AND OBJECTIVES

To measure the relative proportion of PSA in benign breast disease (BBD). To measure lipid profile in BBD.

MATERIALS AND METHODS

Place of study: Department of Biochemistry, Department of Surgery, Gauhati Medical College and Hospital
Case: 50 females with BBD (18–65 years)
Control: 50 (age, sex matched)
Serum total and free PSA by DS-EIA-PSA kit using enzyme-linked immunosorbent assay microplate reader (measured once again after 1 month of surgery/therapy)
Lipid profile [total cholesterol (TC), triglycerides (TGL), and high-density lipoprotein (HDL)]: Semiautoanalyzer
LDL, VLDL: Friedewald's formula

Appropriate and standard statistical tools used.
p-value < 0.05% statistically significant.

RESULTS

TC and LDL higher in test group than control ($p < 0.05$)
Total and free PSA higher in test group than control ($p < 0.05$)
Fall in total PSA and free PSA values in test group after surgery/therapy.

CONCLUSION

From the study, we found a significant association of total and free PSA in benign breast disease and also an alteration in lipid profile. It is highly recommended that one should maintain a healthy lifestyle and check the intake of dietary lipids.

A Study of Serum Adiponectin and Lipid Profile in Women with Breast Cancer

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OBJECTIVE

(1) To analyze the levels of serum adiponectin and lipid profile in cases with breast cancer and compare with normal healthy controls. (2) To find out any possible correlation between the levels of serum adiponectin and lipid profile in breast cancer.

MATERIALS AND METHODS

Sixty patients, with newly diagnosed and histologically confirmed breast cancer, attending Gauhati Medical College and Hospital and/or Dr B Borooah Cancer Institute, Assam, were recruited in the study along with 60 age-, sex-, and ethnicity-matched healthy controls. Serum samples collected after 12 to 14 hours overnight fast were used to estimate serum fasting glucose, urea, creatinine, adiponectin and lipid profile. Serum adiponectin estimation was done using enzyme-linked immunosorbent assay Microplate Reader (Biorad Model 680) and the remaining biochemical parameters were done using MERCK microlab 300 Semiautoanalyzer using standard kits and reagents. Very low-density lipoprotein and low-density lipoprotein cholesterol were calculated using Friedewald's formula. Unpaired Student's t-test was used to compare the variables. Correlations were observed by using Pearson correlation coefficient. The level of significance was set at $p < 0.05$.

RESULTS

The mean adiponectin levels in the case group was significantly lower ($p = 0.0028$) than the control group. This significant difference persisted on further subdividing the subjects according to their menopausal status. The levels of serum total cholesterol, triglyceride, very low-density lipoprotein cholesterol (LDL-C), very low-density lipoprotein cholesterol (VLDL-C), and cholesterol: High-density lipoprotein (HDL) ratio were significantly higher in the cases than the controls. The mean HDL-cholesterol levels were lower (not statistically significant) in cases than controls. A statistically significant negative correlation found between serum adiponectin levels and serum total cholesterol, triglyceride, LDL-C, VLDL-C, and cholesterol: HDL ratio respectively, in case group.

CONCLUSION

Decreased adiponectin levels and altered lipid profile parameters might be associated with the risk of breast cancer and could be used as biomarkers for the same.

Free and Total Prostate-specific Antigen in Breast Cancer Females

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OBJECTIVE

To study the free prostate-specific antigen (PSA) and total PSA levels in serum of females with breast cancer and correlate these levels with staging of breast cancer.

MATERIALS AND METHODS

This study was conducted in the Department of Biochemistry in collaboration with the Department of Surgery and Surgical Oncology, Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana. The study group comprised

of 25 female patients with breast cancer confirmed by fine-needle aspiration cytology and 25 age-matched healthy females were taken as control group. Venous blood was collected, serum free PSA and total PSA levels were estimated in study and control group. Serum free PSA were estimated by sequential chemiluminescent immunometric assay on IMMULITE 1000 and serum total PSA by two-site sandwich immunoassay using direct chemiluminescence technique on ADVIA-CENTAUR CP.

RESULTS

The median levels of free PSA and total PSA were significantly higher (0.040 ng/mL; $p = 0.001$ and 0.060 ng/mL; $p = 0.001$) in cases than controls (0.000 and 0.020 ng/mL) respectively. Free PSA and total PSA were shown statistically significant negative correlation with breast cancer stages.

CONCLUSION

These findings suggest that biochemical markers like free PSA and total PSA levels to be helpful in diagnosis of patients with breast cancer as a circulating tumor marker. Many studies also suggest role of PSA as a diagnostic and prognostic marker.

CA-125 and Lactate Dehydrogenase in Non-Hodgkin's Lymphoma

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OBJECTIVE

To compare the levels of CA-125 and lactate dehydrogenase (LDH) in patients with non-Hodgkin's lymphoma before chemotherapy.

MATERIALS AND METHODS

This study was conducted in the Department of Biochemistry in collaboration with the Department of Medicine (Clinical Hematology Unit), Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India. The study group comprised of 30 patients with Non Hodgkin's Lymphoma confirmed by biopsy. 30 age and sex healthy subjects were taken as control group. Venous blood was collected, serum CA125 and serum LDH levels were estimated in study and control group. Serum LDH and serum CA125 were estimated by enzymatic method using on Randox Rx Suzuka autoanalyzer and two-site sandwich immunoassay using direct chemiluminiscence technique on ADVIA-CENTAUR CP respectively.

RESULTS

The mean levels of LDH and cancer antigen (CA)125 were significantly higher (601.83 ± 260.30 U/L; $p < 0.01$ and 655.97 ± 267.23 U/L; $p < 0.01$) in cases (before chemotherapy) than controls (61 ± 13.28 U/L and 24 ± 5.11 U/L) respectively. But CA125 were significantly more in Stage III and IV patients, no such correlation was present in case of LDH.

CONCLUSION

This showed that CA125 could be an effective marker in staging and diagnosis of non-Hodgkin's lymphoma.

Effect of Chemoradiation on Neutrophil Gelatinase-associated Lipocalin in Cervical Cancer

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OBJECTIVE

Neutrophil gelatinase-associated lipocalin (NGAL) belongs to lipocalin protein family which is a large group of small extracellular proteins with a variety of physiological functions. It has recently emerged as a potential diagnostic and prognostic biomarker in several epithelial malignancies. Carcinoma cervix is very common in Indian population and is still in a need of a biomarker. Thus, NGAL levels were estimated in patients with cervical cancer before and after treatment.

MATERIALS AND METHODS

Levels of NGAL were analyzed using enzyme-linked immunosorbent assay in 30 patients with histopathologically proven patients with carcinoma cervix at the time of diagnosis and 3 weeks after completion of chemoradiation. Results were compared statistically.

RESULTS

The mean value of serum NGAL in pretreatment group was 450 ng/mL and posttreatment serum NGAL value was 504.33 ng/mL. The increase was found to be statistically significant ($p = 0.045$). The difference in levels was also observed with different histological grade, depending on response and even duration of treatment.

CONCLUSION

The NGAL can prove to be an important biological marker in assessing severity and prognosis in cervical patients but more supporting studies are required in this area.

Utility of Serum Interleukin-6 and Vascular Endothelial Growth Factor as a Diagnostic Tool for the Detection of Breast Cancer

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OBJECTIVE

To determine the serum levels of interleukin (IL)-6 and vascular endothelial growth factor (VEGF) in breast carcinoma, and to correlate them with the size of tumor mass, lymph node involvement, and staging of cancer.

MATERIALS AND METHODS

Under aseptic precautions 5 mL of venous blood was collected from 37 breast cancer patients belonging to different stages between the age group of 35 to 60 years and in 20 age-matched healthy females after obtaining due consent and ethical committee clearance. The TNM method for tumor staging based on three tumor characteristics at the time of diagnosis: Tumor size (T), axillary lymph node involvement (N), and the presence of metastases (M) was used for tumor staging. Blood sample was allowed to stand for 30 minutes at room temperature in vacutainer. Serum levels of VEGF and IL-6 were determined by enzyme-linked immunosorbent assay.

RESULTS

The results showed that the serum IL-6 and VEGF levels were significantly increased in cases when compared with controls ($p = 0.001$, $p = 0.001$) respectively. The serum IL-6 and VEGF levels significantly correlated with TNM staging ($p = 0.001$, $p = 0.001$). Serum IL-6 positively correlated with serum VEGF ($r^2 = 0.668$, $p = 0.01$). IL-6 and VEGF levels in serum did not show correlation with size of tumor ($p = 0.45$, $p = 0.17$) and lymph node metastasis ($p = 0.95$, $p = 0.68$).

CONCLUSION

IL-6 and VEGF levels in serum can be used as a diagnostic tool and also as a prognostic factor in breast cancer. Further studies can be done with these markers for early detection of recurrence of breast cancer.

Correlation of Cancer Antigen 19-9 Levels with Histopathological Types in Gallbladder Cancer

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INTRODUCTION

Gallbladder cancer is the most common malignancy of the biliary tract, accounting for 80 to 95% of biliary tract cancers. Cancer of the gallbladder is uncommon, although it is the fifth most common gastrointestinal malignancy. Among Indian males it stands second to oral cancer and in females, it shares the third place. Most common malignant disorder of GIT is seen in our country that of liver, bile, gallbladder, pancreas, bile duct, and colorectal. Tumor marker, especially cancer antigen (CA) 19-9, is the most sensitive tumor marker in the detection of gallbladder cancer.

OBJECTIVE

A retrospective analysis of CA 19-9, immunohistochemistry CK7 and CK20 in gallbladder cancer and compared with histopathological type of grade.

MATERIALS AND METHODS

This study comprises about 210 cases of gallbladder cancer preoperatively. Serum levels of CA 19-9 were determined using assay, which is based on chemiluminescent microparticle immunoassay.

CONCLUSION

It was observed that serum concentration of CA 19-9 increased with advancing stage. It increases the accuracy of diagnosis and prognosis of gallbladder cancer.

Study of the Anemic Characteristics in Staging and Treatment of Multiple Myeloma Patients

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OBJECTIVE

Anemia is a frequent finding in patients with myeloma. The severity of anemia is important in determining the stage and prognosis of disease as determined by the Durie and Salmon staging criteria. Like anemia of chronic disease, the anemia of myeloma is generally normochromic and normocytic, and it is characterized by shortened erythrocyte survival with failure of the bone marrow to compensate by increased red cell production. Study of anemia panel correlates well with the severity and treatment of the disease.

MATERIALS AND METHODS

Patients with benign and malignant tumors were selected for the study. The patients belonged to the age group of 30 to 86 years.

Serum protein electrophoresis was done on fully automated electrophoresis analyzer Interlab G26. Quantitation of immunoglobulins was done on Beckman Coulter Immage 800 analyzer.

Total iron and total iron binding capacity (TIBC) were estimated using Beckman Coulter kits on fully automated Beckman Coulter AU640 chemistry analyzer, ferritin assays were carried out on fully automated immunoassay analyzer Architect i2000sr system, and % Transferrin saturation was calculated using the formula (Iron/TIBC) *100.

Complete blood count (CBC) measured in fully automated CBC analyzer.

RESULTS

In the present study, we examined the usefulness of total iron, TIBC, ferritin, % transferrin saturation, and CBC for different multiple myeloma patients. Based on the biochemical criteria, anemia of chronic disease – multiple myeloma, correlates with the severity and treatment of the disease.

CONCLUSION

After analyzing the systematic steps in the development of anemia of chronic disease – multiple myeloma and its severity, biochemical parameters are found to play an important role in deciding the line of treatment.

Effect of *Centella asiatica* Extract on Claudin-6 Expression in T-47D Breast Cancer Cell Line

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OBJECTIVE

Claudin proteins are expressed at tight junctions of epithelial and endothelial cells. There are 27 isoforms of Claudin protein. Claudin-6 has been studied in breast, ovarian, hepatic and colorectal malignancies. The expression of Claudin-6 is reduced in all the stages and grades of breast cancer- thus it acts as a tumor suppressor in breast cancer. The medicinal plant, *Centella asiatica* (Thankuni) is a known immunomodulator, which also has anti-cancer and anti-bacterial properties.

MATERIALS AND METHODS

Breast adenocarcinoma cell line, T47-D was maintained in culture as per established protocols. Aqueous extract of *C. asiatica* prepared using standard method was filter sterilized (0.22 µm) and was added to the T-47D cells grown on 6 well culture plates. IC_{30} and IC_{50} doses of *C. asiatica* extract was determined. The cells were treated with IC_{30} and IC_{50} doses of the extract for 24 hours

and 72 hours. The expression of Claudin-6 was determined by quantitative polymerase chain reaction (qPCR) and indirect immunofluorescence.

RESULTS

The expression of Claudin-6 assessed by qPCR showed an increase upon treatment with aqueous extract of *C. asiatica* during the first 24 hours (upto 7.1 fold increased expression with the IC_{50} doses) but this increase in expression was not maintained at 72 hours. The results were further confirmed by the study of Claudin-6 protein expression using indirect immunofluorescence.

CONCLUSION

The expression of Claudin-6 in breast cancer cells was increased on treatment with aqueous extract of *C. asiatica.* Thus *C. asiatica* might have anti-cancer properties in breast cancer.

Free PSA Measurement and Use of its Ratio to Total Prostate-specific Antigen Levels in Benign and Malignant Prostate Cancer

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INTRODUCTION

Prostate cancer screening is focused only on total prostate-specific antigen (PSA) levels leads to many false-positive results, with unnecessary biopsies and emotional distress. The current total PSA cutoff level also produces many false-negative results. Several approaches have been proposed to improve the diagnostic accuracy of PSA.

OBJECTIVE

To determine free to total PSA ratio to differentiate between Benign prostate hyperplasia (BPH) and prostate cancer. To improve the accuracy of the PSA test and the specificity of prostate cancer detection particularly when PSA levels fall between 4 and 10 ng/mL levels.

MATERIALS AND METHODS

The study group consisted of a total of 124 male prostate cancer patients referred to genitourinary unit of Tata Memorial Hospital between the age group 50 to 90 years. Serum levels of free PSA and total PSA were determined using assay, which is based on chemiluminescent microparticle immunoassay.

RESULTS

Free to total PSA ratios in the prostate cancer group were significantly lower than those in the BPH group. A cut-off of F/T PSA ratio% at 18% improves diagnostic sensitivity and specificity for prostate cancer.

CONCLUSION

Percentage FPSA value ratio improves PSA-based differential diagnosis of prostate cancer in patients and helps differentiate cancer of prostate from benign prostate hyperplasia and reduce unnecessary prostate biopsies.

Role of Metformin in Epithelial Ovarian Cancer cells

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OBJECTIVE

Ovarian cancer is one of the most common lethal gynecological malignancy. Tumor cells have the capacity to respond to chemotherapy through multiple cell death pathways, such as apoptosis and autophagy. In this study we have attempted to evaluate the effect of metformin (an antidiabetic drug) in ovarian cancer because of its promising effect in an array of cancers.

MATERIALS AND METHODS

In this study, the human ovarian cancer cell line SKOV3 cell line was used to assess the effect of metformin on apoptosis and autophagy. The cancer cells were treated with metformin. Flow cytometry and Western blotting were used to characterize the effects of treatments.

RESULTS

Metformin inhibited proliferation of SKOV3 ovarian cancer cells, caused cell cycle arrest in G0/G1 and S phase, induced apoptosis by modulating apoptotic proteins Bcl-2 and Bax, but was not able to induce autophagy as seen by decreased Beclin expression.

CONCLUSION

These data illustrated that metformin may cause induction of apoptosis and inhibition of autophagy in multidrug resistant human ovarian cancer cells like SKOV3. Hence, it represents a novel approach to increase the efficacy of chemotherapeutics by using metformin as a chemoadjuvant as an anticancer modality.

Serum Lactate Dehydrogenase in Patients with Carcinoma of Breast

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OBJECTIVE

To analyze serum lactate dehydrogenase (LDH) in patients' carcinoma of breast.

MATERIALS AND METHODS

Serum LDH is estimated in women with cancer of the breast attending surgery outpatient and inpatient department in Government Medical College and Hospital, Nagpur Maharashtra, India. Fasting blood samples were collected from 50 healthy controls and 50 histopathologically confirmed female breast cancer patients (premenopausal and postmenopausal) aged 30 to 70 years. Serum LDH was estimated preoperatively and postoperatively.

RESULTS

There was a significant increase in preoperative serum LDH levels ($p < 0.001$) and decrease in postoperative serum LDH levels ($p < 0.0001$) in breast cancer patients as compared with controls, and values were significantly higher in postmenopausal cases.

CONCLUSION

The study suggests that serum LDH might prove to be a biomarker in early detection of the disease and can also be useful as a prognostic marker for breast cancer.

Role of Cholinesterase in Osteosarcoma

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OBJECTIVE

Non-neuronal cholinergic system is known to be involved in the regulation of function and that cholinergic dysfunction has been related to pathophysiology of certain diseases. Human AChE is expressed in osteoblasts and chondrocytes in a manner dependent both on their state of proliferation and differentiation. Status of serum cholinesterase levels in osteosarcoma is not clear. Hence, the present study was planned to analyze the status of cholinesterase in patients with osteosarcoma.

MATERIALS AND METHODS

Serum cholinesterase levels were analyzed in 30 cases of osteosarcoma and 30 healthy controls.

RESULTS

Serum calcium and alkaline phosphatase levels were significantly raised with osteosarcoma (group I) as compared with controls (group II). Serum phosphorus levels were lowered in group I as compared with group II ($p > 0.05$). Serum cholinesterase levels were significantly decreased in osteosarcoma patients (group I) as compared controls (group II, $p < 0.05$).

CONCLUSION

Low levels of serum cholinesterase levels observed in the present study demonstrate that cholinesterase secreted by osteoblasts is consumed in bone formation and tumorigenesis and acetylcholinesterase inhibitors may have a therapeutic role in future.

Molecular Biology

Vitamin D Receptor Gene Polymorphism in Women with Breast Cancer

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INTRODUCTION

Breast cancer is the most frequently diagnosed cancer and is the leading cause of cancer death among women worldwide. Breast cancer is a heterogeneous disease and develops in interaction of hereditary and environment risk factors. According to the literature, vitamin D deficiency is a risk factor for developing breast cancer. In recent years, there has been considerable interest in whether vitamin D inhibits breast cancer development. Furthermore, Fok I polymorphism of Vitamin D Receptor (VDR) gene has been shown to be associated with breast cancer.

OBJECTIVE

To evaluate serum levels of vitamin D and VDR gene polymorphism in breast cancer cases and their association with each other.

MATERIALS AND METHODS

Serum vitamin D levels were assessed in 30 women with breast cancer pre- and postoperatively and also in 30 healthy age-matched controls by enzyme-linked immunosorbent assay. Deoxyribonucleic acid extraction, polymerase chain reaction, and restriction fragment length polymorphism analysis using Fok I restriction enzyme were done for studying Fok I polymorphism in VDR gene.

RESULTS

The difference in vitamin D levels in preoperative cases (mean value) and postoperative cases (mean) was found to be highly significant ($p < 0.001$). The difference between Vitamin D levels in preoperative cases and controls was also found to be statistically significant. No significant difference was seen in the Fok1 genotype (FF, Ff, ff) among cases and controls. Significant difference in vitamin D levels were observed between the FF (19.7 ng/mL) and ff (10.5 ng/mL) polymorphism.

CONCLUSION

Hypovitaminosis D can be implicated in etiopathogenesis of breast cancer and this decrease was associated with Fok I VDR polymorphism.

Study of Paraoxonase 1 Arylesterase Activity, its Polymorphism and their Correlation with Endothelial Function in Young Population

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INTRODUCTION

Paraoxonase (PON) is a high-density lipoprotein-bound antioxidant enzyme which inhibits atherosclerosis and endothelial dysfunction. It plays a role mainly by reducing oxidation of low density lipoproteins and favors vascular effects of high density lipoproteins. The endothelium is a primary target for mechanical and biochemical injuries. Nitric oxide produced by silent endothelium inhibits cellular pathway of inflammation, proliferation and thrombosis. Noninvasive measurement of endothelial function is a focus of interest to assess atherosclerotic disease.

AIMS AND OBJECTIVES

Study focuses on PON 1 arylestrase activity, polymorphism, and its role in endothelial function in young population.

MATERIALS AND METHODS

Study was conducted at Swami Ramanand Teerth Rural Government Medical College Ambajogai, Maharashtra, India to evaluate plasma level of PON1 arylestrase, and lipid profile of 91 healthy 1st year MBBS students. BMI and other vitals recorded then brachial artery flow-mediated vasodilatation recorded before and after application of cuff of sphygmomanometer with the help of ultrasonography.

CONCLUSION

Phenotype frequencies for Q192R polymorphism were 24% for RR, 64% for QR and 11% for QQ phenotype. PON 1 arylestrase activity was higher in QQ>RR/QR (p-value = 0.020) phenotypes also brachial artery FMV was higher in QQ than in RR/QR phenotype but statistically not significant. In multivariate regression, PON1 arylestrase activity (p-value = 0.582) was not found to be significant, while phenotype activity (Neglekerke's $R^2 = 0.104$, p-value = 0.026) was found to be independent predictors of brachial FMV.

Coinheritance of Modifier Genes in Hemoglobinopathies with Phenotypic Heterogeneity: Two Case Reports

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OBJECTIVE

Clinical and molecular genetic studies over the course of last 50 years have demonstrated how coinheritance of modifier genes alter the balance of α-like and β-like globin gene expression, which may transform severe, transfusion-dependent β-globin gene defect into relatively mild forms of anemia and vice versa. Double heterozygous state of α/β thalassemia may modify the phenotype. Contrary to the beneficial effect demonstrated by coinheritance of α and β-thalassemia, inheritance of excess α-globin genes worsens the α-like/β-like globin chain imbalance and results in a more severe clinical phenotype. Our aim was to identify concomitant mutations in α and β-globin genes which lead to complex hemoglobinopathies.

MATERIALS AND METHODS

Case 1 – A young adult male with reduced hematological indices, cholelithiasis, mild recurrent jaundice, and case 2 – A 5-year-old female child with severe anemia, frequent episodes of fever was referred for further evaluation. Quantitative assessment of Hb fractions were performed by high-performance liquid chromatograph (HPLC) and molecular study for β-globin gene mutations by deoxyribonucleic acid sequencing and α-globin gene mutations by multiplex ligation probe amplification method.

RESULTS

In case 1 HPLC showed HbA_2 – 2.6%, HbF – 90.1%, HbA – 7.3%. The genetic analysis showed homozygous β-globin gene mutation IVSI-5 (G>C) with α-globin gene deletion. In the second case, HPLC showed HbA_2 – 10.8%, HbF – 3.4%, HbA – 85.8%. Molecular analysis showed α-globin gene triplication and a heterozygous β-globin gene mutation at C.129 T–A.

CONCLUSION

Our data suggest that it would be valuable to study coexisting α-globin mutations in subjects with β-globin gene mutation, especially in populations with a high frequency of hemoglobinopathies. Here, we review the evidence that reduction of α-globin expression may provide an equally logical approach to ameliorating clinically severe forms of β-thalassemia.

The Expression of CTLA4 Gene (a T-cell Regulatory Gene) can be Influenced by the Polymorphism in Exon 1 of the Gene

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INTRODUCTION

CTLA4 protein is expressed on the surface of activated T cells, exhibiting a negative regulatory role. This protein along with CD28, a positive regulator of T cells, maintains immune system homeostasis. Polymorphism in CTLA4 gene leads to reduced surface expression of CTLA4 protein, resulting in T cells becoming overactive against self-antigens, increasing the susceptibility of autoimmune disorders. The prototype being considered here is systemic lupus erythematosus (SLE).

OBJECTIVE

(1) To assess frequency of CTLA4 gene polymorphism among cases/controls; (2) to analyze effect of polymorphism over protein and disease expression.

MATERIALS AND METHODS

CTLA4 genotype (A/G) of 100 known SLE patients was compared with 100 matched healthy controls. Genotypic expression was correlated to level of CTLA4 protein and expression of disease. Genotype of patients and controls was detected by amplification-refractory mutation system polymerase chain reaction. Level of protein was measured by enzyme-linked immunosorbent assay.

RESULTS

The genotype distribution is in Hardy Weinberg equilibrium (chi square = 0.06, p-value 0.80). The frequency of CTLA4 + 49GG genotype is higher in cases than controls (chi square = 32, p-value 0.001). Positive correlation exists between CTLA4 protein levels and GG genotype ($p < 0.01$). GG genotype individual have comparatively younger age of onset of disease.

CONCLUSION

Transition from A to G allele at 49th position in exon 1 of CTLA4 gene will result in exchange of alanine for threonine. There is altered intracellular trafficking, surface expression of the protein gets reduced and plasma level gets elevated, increasing susceptibility to SLE. Hence, G allele in exon 1 of CTLA4 gene will increase risk of SLE.

NISCH Promoter Hypermethylation in Lung Cancer: A Case – control Study

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OBJECTIVE

Evaluate the frequency of promoter hypermethylation of tumor suppressor NISCH in cell-free deoxyribonucleic acid (cfDNA) of lung cancer patients and its correlation with clinicopathological variables. â€¢ Compare serum nischarin levels among cases and controls.

MATERIALS AND METHODS

Forty histopathologically confirmed lung cancer cases, 30 smoker and 30 nonsmoker controls were enrolled. Plasma cfDNA was extracted and subjected to bisulfite treatment followed by methylation-specific polymerase chain reaction. Serum nischarin levels were estimated by enzyme-linked immunosorbent assay. Statistical analysis was performed using Statistical Package for the Social Sciences 22.0.

RESULTS

The frequency of promoter hypermethylation of NISCH was significantly higher in lung cancer patients and noncancerous smokers as compared with lifelong nonsmoker controls ($p < 0.05$). It did not vary with smoking status among cancer cases. No significant association was found with staging or histological grading. The NISCH methylation was found to be significantly higher among smoker controls. No significant association was found with type or duration of smoking. Pack years and packs per day were significantly higher in the methylated group. Serum nischarin levels showed no significant association with NISCH methylation or clinicopathological variables.

CONCLUSION

NISCH is highly methylated in plasma cfDNA of lung cancer patients, hence, it could serve as a part of blood-based biomarker panel for early diagnosis of lung cancer. â€¢ Since NISCH is highly methylated in both high-risk smoker controls and cancerous nonsmokers, NISCH methylation may mark the convergence of varied etiologies of lung cancer. Its potential, as a universal therapeutic target for lung cancers regardless of clinicopathological heterogeneity, may be investigated.

Role of *CYP1A1**4 (2453C>A) Gene Polymorphism in Pathogenesis of Male Infertility

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INTRODUCTION

Genetics is known to play a role in etiopathogenesis of male infertility. CytP450 is involved in metabolism of fertility hormones and many xenobiotics are known to have endocrine disrupting effect. Effect of a few polymorphisms of CytP450 has been evaluated and seen to have variable effect on male infertility.

OBJECTIVE

The present study is designed to explore the effect of *CYP1A1**4 (2453C>A) gene polymorphism on seminal parameters and thereby male infertility.

MATERIALS AND METHODS

Male partner of infertile couple (n = 80) were evaluated for their sperm parameters as per seminal analysis method recommended by WHO (2010). *CYP1A1**4 (2453C>A) gene polymorphism was assessed by allele-specific oligonucleotide polymerase chain reaction. Sperm parameters were compared by Kruskal–Wallis test and risk of developing male infertility in polymorphic form of *CYP1A1**4 (2453C>A) gene was calculated from odds ratio.

RESULTS

Sperm count, motility, and morphology were significantly affected in polymorphic genotype of *CYP1A1**4 (2453C>A) gene when compared with wild genotype of *CYP1A1**4 (2453C>A) gene. Odds of developing male infertility among the polymorphic genotype were 10.31 (CI: 3.01–35.24; $p < 0.0001$).

CONCLUSION

*CYP1A1**4 (2453C>A) gene polymorphism alters the sperm characteristics and is a risk factor for male infertility.

Oxidative Stress, Nutrition

Effect of Dietary Habits and Lifestyle Patterns on Lipid Profile, Atherogenic Index of Plasma and Body Mass Index in Nondiabetic Adults of South Karnataka Region

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INTRODUCTION

Atherosclerosis is expected to be the leading cause of mortality worldwide by 2020. One of the major risk factors for the development of atherosclerosis is dyslipidemia. The causes may be primary (genetic) or secondary causes which include sedentary lifestyle with excessive dietary intake of saturated fat, cholesterol, and transfats.

OBJECTIVE

To evaluate fasting serum lipid profile and atherogenic index of plasma (AIP) in local population and to correlate it with dietary habits and life style found in this geographical area.

MATERIALS AND METHODS

100 individuals between age group of 25 to 65 years were included in the study after obtaining approval from the Institutional Ethics Committee of Kasturba Hospital. Lipid profile was estimated using Cobas 6000. Atherogenic index was calculated using formula log TG/HDL mmol/L. Diet history was taken using 24-hour recall questionnaires and height and weight were measured using stadiometers and weighing scales respectively.

RESULTS

Subjects were divided into three groups I, II, and III based on increasing body mass index (BMI) and significant ($p < 0.05$) increase in atherogenic index was seen from groups I to III. Group with higher BMI and higher coconut as well as groundnut oil consumption showed higher AIP. Percentage of subjects consuming lesser vegetables, pulses and showing sedentary lifestyle also increased with increase in BMI.

CONCLUSION

Apart from deranged lipid profile; higher coconut and ground nut oil consumption, sedentary lifestyle and increased BMI lead to increased atherogenic index of plasma in these subjects and hence, more susceptibility to coronary artery diseases.

The Study of Thyroid Dysfunction in Beta-Thalassemia Major Patients on Multiple Blood Transfusions

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OBJECTIVE

The blood transfusion and chelation therapy has dramatically prolonged life expectancy in thalassemia patients, thus transforming thalassemia from a fatal disease to a chronic one compatible with prolonged life. But endocrine complications became more frequent in long term survivors. The frequency of hypothyroidism in thalassemia patients ranges from 6 to 30% worldwide, although, lower prevalence was found in patients who had evidence of lower iron load. This study is aimed to prove that the thyroid dysfunction in thalassemia patients may be a result of iron overload.

MATERIALS AND METHODS

A hospital based cross-sectional case control study involving 20 known beta-thalassemia patients receiving blood transfusion and chelation therapy and 20 control individuals and measurement of their serum total thyroxine (T4), thyroid-stimulating hormone (TSH), and ferritin by enzyme-linked immunosorbent assay method.

RESULTS

Unpaired t-test done by Statistical Package for the Social Sciences software shows significant difference between case and control groups in cases for TSH (6.04 ± 3.64 *vs* 3.82 ± 1.34 with $p = 0.013$) and ferritin (522.03 ± 313.1 *vs* 45.67 ± 23.44 with $p < 0.001$) but no significant change in T4 (8.05 ± 2.4 *vs* 9.36 ± 2.2, $p = 0.079$).

DISCUSSION

The increased iron overload in thalassemia patients receiving blood transfusion and chelation as measured by serum ferritin may be responsible for increased prevalence of thyroid dysfunction among them as compared with age- and sex-matched healthy individuals.

Study of Various Oxidative Markers in Pregnancy-induced Hypertension

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OBJECTIVE

To study nitric oxide synthesis and its effects in pregnancy-induced hypertension (PIH) patients.

MATERIALS AND METHODS

One hundred and twenty subjects were included in this study, of these 60 were normal healthy pregnant females and 60 were having PIH. The parameters assessed were nitric oxide in terms of nitrate and nitrite by Griess method, nitrothiol by Cook et al method, total thiol by Habeeb method, superoxide dismutase (SOD) by Kajari Das method, uric acid by Uricase method.

RESULTS

The findings of the study showed that nitric oxide levels were decreased significantly compared with healthy pregnant females. Nitrothiol values were found to be increased in PIH as compared with healthy pregnant women. Total thiol values were significantly low compared with control; SOD levels were significantly decreased in PIH as compared with control. Also hyperuricemia was seen in PIH.

CONCLUSION

Thus, it is concluded from this study that oxidative stress represents a point of convergence for several contributing factors potentially leading to the clinical manifestations of pregnancy induced hypertension. Antioxidants are used up while scavenging the free radicals. Adaptive mechanisms enhancing the maternal antioxidant defense system that counteract the effects of free radicals could prevent the occurrence of oxidative stress.

Study to Evaluate the Oxidative Stress in Beta Thalassemia Major Patients Receiving Multiple Blood Transfusion

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OBJECTIVE

To prove that thalassemic patients receiving multiple blood transfusion suffers from oxidative stress.

MATERIALS AND METHODS

It is a prospective study to evaluate the oxidative stress in beta thalassemia major patients (n = 30) receiving multiple blood transfusion and its comparison to age and sex matched healthy controls and to correlate iron overload (ferritin) in these patients with oxidative stress (malondialdehyde and nitric oxide). Serum ferritin levels, serum malondialdehyde and serum nitric oxide levels were estimated.

RESULTS

Mean serum ferritin in control groups was 76.6 ± 31.96 ng/mL and in cases it was 635.2 ± 125.5 ng/mL. The difference in the mean values of ferritin is statistically significant ($p < 0.05$). Mean serum malondialdehyde (MDA) in control was 89.27 ± 16.21 ng/mL and in cases it was 328 ± 50.78 ng/mL. The mean level of nitric oxide in controls was 0.05 ± 0.014 mM, the value in cases was 0.16 ± 0.048 mM. The value is statistically significant ($p < 0.05$).

CONCLUSION

In thalassemic patients, the levels of both serum ferritin, MDA and nitric oxide were increased. The increased lipid peroxidation and oxidative stress was corroborated by increased MDA and nitric oxide levels and increased iron overload by serum ferritin levels.

Effect of Administration of Radio-iodine Contrast on Oxidative Stress in Nondiabetic Patients undergoing Coronary Angiography

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BACKGROUND

Contrast-induced nephropathy (CIN) is a serious complication of the use of iodinated contrast media for interventional procedures like coronary angiography/angioplasty. One of the main underlying pathophysiological mechanisms underlying CIN is the generation of reactive oxygen species along with tubular toxic damage. With this background the present study was taken up to study the time course changes in the markers of oxidative stress like lipid hydroperoxides, which represents an early stable primary product of lipid peroxidation along with antioxidant enzyme catalase after administration of radio-iodine contrast in patients undergoing coronary angiography.

MATERIALS AND METHODS

Thirty nondiabetic patients scheduled to undergo coronary angiography were included in the study. 2 mL of venous blood was collected in heparinized bulb at four time points, i.e., baseline (0 hour), 30 minutes, 2 and 4 hours after contrast administration. Plasma was separated and the RBCs were lysed to prepare hemolysate. Plasma lipid hydroperoxides and erythrocyte catalase activity were measured by spectrophotometric and continuous spectrophotometric rate determination methods respectively. Statistical analysis was done using Medcalc version 12.1.

RESULTS

Plasma lipid hydroperoxide levels showed a significant increase ($p < 0.001$) of 65% above the baseline levels while erythrocyte catalase activity showed a significant decrease ($p < 0.001$) of 19% from the baseline levels at the end of 4 hours.

CONCLUSION

The findings of the present study show the occurrence of oxidative stress after administration of contrast medium. Ameliorating the oxidative stress with use of antioxidants like glutathione, N-acetyl cysteine should be used routinely so as to prevent oxidative stress-induced renal damage following contrast administration.

Oxidative Stress and Calcium Phosphorus Ratio in Rheumatoid Arthritis

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OBJECTIVE

Present study aims to determine the oxidative injury by estimating the levels of prooxidant malondialdehyde (MDA) and to study the role of oxygen-derived free radicals in rheumatoid arthritis (RA) by assessing the influence of disease process on serum calcium, phosphorus, and alkaline phosphatase (ALP) levels in a view to study the beneficial influence of adding free radical scavengers to the existing therapeutic regimen.

MATERIALS AND METHODS

The study was conducted on 50 clinically diagnosed cases of RA who fulfill the American Rheumatism Association criteria, compared with age- and sex-matched controls without systemic diseases like diabetes mellitus, hypertension, RF. Fasting venous blood samples were collected and nonhemolyzed sera were processed for all biochemical parameters. Estimation of MD was done by thiobarbituric acid assay, calcium by O-cresolphthalein complexone method, phosphorus by Fiske and Subbarao method, ALP by King and Kind. Statistical analysis was done by using Student's "t" test and p-value <0.05 was considered as statistically significant.

RESULTS

The results that were found statistically significantly increase in serum MDA levels ($p<0.001$), decrease in serum calcium ($p<0.001$), increase in serum phosphorus ($p<0.01$), decreased Ca,P ratio ($p<0.001$, and with no statistically significant change in serum alkaline phosphatase levels ($p>0.05$) in RA patients as compared with control group.

CONCLUSION

The observations in the present study show that oxidative stress plays an important role in the etiopathogenesis of RA and addition of free radical scavengers as supplements may prove to be beneficial. There is an altered calcium and phosphorus metabolism and Ca,P ratio in RA and increase in MDA levels, an important marker.

A Correlation of Nutritional Parameters in Patients with Depressive Disorders

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OBJECTIVE

This study is designed to find out association of nutritional parameters in patients with depressive disorder and find out correlation of various components of nutrition with depression score. Whether biochemical parameters which define nutrition status of patients make difference between the patients with depression and normal subjects is also studied.

MATERIALS AND METHODS

In this descriptive – analytic study, all patients referred to psychiatric clinic for outpatient management were studied. Twenty-five patients with depressive disorders were included. We selected 25 healthy controls without after being any medical or psychiatric diagnosis. All patients and control subjects gave informed consent to participate in the study. The Beck Depression Inventory was filled for them to assess the severity of their depression. The blood samples were drawn after a 12-hour fasting for detecting blood glucose, lipid profile, serum total protein, albumin iron, total iron binding capacity, calcium and magnesium.

RESULTS

Total cholesterol, triglyceride, and low-density lipoprotein cholesterol levels are significantly higher and high-density lipoprotein cholesterol level was lower in patients with depressive disorder than the other groups. Blood glucose, serum total protein, albumin, iron, calcium, and magnesium levels were significantly lower in patients with depressive disorder than the control groups.

CONCLUSION

These findings may be helpful in management of depression and better outcome. Although these results do not suggest that serum lipid profiles can be used as biological markers to distinguish depressive disorders, larger samples are required to prove such results in the future.

Busting Nutritional Myths

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INTRODUCTION

Nutritional supplement industry has now grossed millions of dollars but are yet not under strict vigilance like the pharmacopeia, within India or elsewhere. Tall claims by every company usually confuse their consumers about which supplement is best for them. This usually led to wrong selection and hence, under- or overintake of various supplements. Moreover, false propaganda and myths about supplement's necessity, curative power, better physical and mental growth bears a big economic burden in a developing country like India.

OBJECTIVE

An attempt to scientifically clarify nutritional myths and hence, prevent misusage/overdosing of nutrition supplements.

MATERIALS AND METHODS

Review article.

CONCLUSION

Allaying these myths can make consumer wiser on whether there is any need of supplements or not; after a healthy diet. Secondly, does the supplement justify the purpose for which it is being consumed?

Atherothrombosis, Nitrosative and Oxidative Stress in Young Prediabetic Males

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OBJECTIVE

More than 6% of the global population is affected with diabetes mellitus. World Health Organization predicts a prevalence of 552 million persons in 2030. Recent studies have revealed a strong association of atherothrombosis, serum nitric oxide metabolite, oxidative stress in diabetes mellitus. Hence, the study aims at evaluating the role of blood glucose levels, lipid profile, plasma fibrinogen, serum nitric oxide metabolite, FOX2 and ferric-reducing ability of plasma (FRAP) in the development of atherothrombosis.

MATERIALS AND METHODS

This case – control study included 109 male subjects (aged 28 ± 5.44; without diabetes mellitus, thyroid disease, hypertension, or coronary artery disease) and 110 age- and sex-matched healthy controls. Atherosclerotic risk factors (lipid profile, blood pressure, plasma fibrinogen), fasting blood sugar and postglucose load blood glucose (PGBS) levels were measured by commercial kits adapted to autoanalyzer. Anthropometric measurements, height, weight, waist–hip ratio were measured. Serum oxidative stress was estimated by ferrous oxidation products in xylenol orange version 2 (FOX2) and total antioxidant status by FRAP assay. Serum nitric oxide metabolite was estimated by Griess method.

RESULTS

Compared with controls, cases had significantly higher levels of fasting (96.4 ± 5.7 *vs* 115 ± 7.49 mg%) and PGBS blood glucose levels (112 ± 4.7 *vs* 148 ± 6.65 mg%). Lipid profile (total cholesterol 146.06 ± 14.3 *vs* 288.52 ± 10.6; triglyceride 132.18 ± 2.91 *vs* 242.64 ± 19.6; high-density lipoprotein 48.56 ± 5.03 *vs* 28.6 ± 3.9; low-density lipoprotein 88.71 ± 13.58 *vs* 164.8 ± 46.34), plasma fibrinogen (128.6 ± 1 *vs* 300.25 ± 63.4), serum nitric oxide metabolite (37.49 ± 4.9 *vs* 69.73 ± 17.18), oxidant load (4.56 ± 0.6 *vs* 16.29 ± 4.1 µmol/L eq to H_2O_2), and antioxidant status (96.79 ± 6.82 *vs* 422 ± 13.46 µmol/L eq to ferrous sulfate) was significantly higher in cases; $p < 0.05$ is considered to be significant.

CONCLUSION

Increased blood glucose level, lipid profile, oxidative stress, nitric oxide metabolite, and plasma fibrinogen initiate pathological changes for the formation of artherothrombosis in prediabetics.

Biochemical Changes on Stored Red Blood Cells after Irradiated

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INTRODUCTION

Irradiation leads to enhancement of storage lesions, which could have deleterious effects when such blood is transfused. The present study was, therefore, undertaken to assess the storage lesions during conventional preservation of whole blood after gamma irradiation.

MATERIALS AND METHODS

The study was conducted on blood donated by 30 healthy volunteer donors. Effect of storage was analyzed at 0 and 21 days after irradiation. Biochemical parameters were measured using Randox Suzuka autoanalyzer and Combiline ISE analyzer.

RESULTS

Significant changes were observed in serum sodium, potassium and lactate dehydrogenase levels ($p < 0.001$). On the other hand, there was no impact on rest of the parameters.

CONCLUSION

Our findings indicated that gamma irradiation causes an increase in sodium and potassium permeability of the red blood cell (RBC) membrane during cold storage, which is reversible when the RBCs are warmed to 37°C. These biochemical changes might not have clinical significance when irradiated blood is transfused to a select group of patients. There is a need for further *in vivo* studies to follow up the consequences of transfusion of irradiated blood in patients.

Medical Education and Research Methodologies

Adequacy of Currently Practiced Policies for Imparting Medical Education: Opinions of First Year Bachelor of Medicine and Bachelor of Surgery Students

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OBJECTIVE

It is imperative for the medical teachers to identify factors that will help the Bachelor of Medicine and Bachelor of Surgery (MBBS) students achieve better during their tenure in the medical college and beyond. Thus, it is important to incorporate their point-of-view while designing or amending the current teaching policies. Hence, the aim of our study was to evaluate the students' perception about the format and duration of lectures. We also enquired whether they go through the topics covered, before and after the lecture.

MATERIALS AND METHODS

The anonymized feedback was from the first year MBBS students ($n = 115$) and analyzed. They were given an option to choose from any or as many of the four choices or opt for cannot say (if they do not know or do not want to answer) or give their own comments or do not respond to any question at all.

RESULTS

The maximum students (57.14%) were of the opinion that didactic lectures should be supplemented with small group discussions, and the optimum duration of a lecture must be between 30 and 45 minutes (46.81% of students). About 57.43% of the students said they never go through the topic before the lecture, while 63.37% of the students said that they sometimes go through the topic after the lecture due to time constraints.

CONCLUSION

Methods of imparting medical education will be embraced better if the concerns of the recipients are analyzed and addressed. This will probably help the MBBS students in better learning, which should reflect in their approach toward patients.

Introducing Self-directing Learning in Biochemistry Curriculum for Year 1 Medical Students: Our Institutional Experience

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OBJECTIVE

The study aimed to inculcate independent learning ability in biochemistry among undergraduate medical students by implementing an active self-directed learning (SDL) module. The perceptions of students and faculty regarding the same were also explored.

MATERIALS AND METHODS

The study was conducted in the Department of Biochemistry, Government Medical College and Hospital, Chandigarh. One hundred year-1 Bachelor of Medicine and Bachelor of Surgery students were the subjects of the study. An active SDL module using JIGSAW technique was developed and implemented. The student and faculty perceptions were recorded through semistructured interviews.

RESULTS

Most of the students felt that the active learning strategies facilitated their learning. They felt they had a better understanding of the topic when they took responsibility for their own learning. Students felt that the activity had stimulated a greater interest in the subject of biochemistry. The faculty felt that the exercise had been effective; students seemed motivated and enthusiastic to learn and participated actively in the whole process. They felt that the SDL sessions gave the students a freedom of learning according to their needs. However, a blend of different techniques for teaching was endorsed by both the faculty and students.

CONCLUSION

The experience re-emphasized the belief that the most meaningful learning for any student is that which results from the learner constructing his/her own knowledge and meaning from the subject matter. Fostering self-directed learning skills in the students by means of active learning strategies equips the students with the right attitude, knowledge, and skills required to be consistent lifelong learners.

How to Write a Properly Organized Thesis?

Pooja SK Rai

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INTRODUCTION

A thesis consists of an argument or a series of arguments combined with the description and discussion of research you have undertaken. Each thesis should preferably have a guide and coguide from the same department. Choose a thesis topic, consider multiple options, do preliminary testing, and then refine good ideas.

The choosing of sample size depends on nonstatistical and statistical considerations. The nonstatistical considerations may include availability of resources, manpower, budget, ethics, and sampling frame. When reporting experiments on human subjects, the procedures should be followed in accordance with the ethical standards on human experimentation.

The protocol must be accompanied by the patient information sheet, which must provide the subjects with detailed information in simple and local language, e.g., Hindi, which can be understood by them. The informed consent form should be signed by two witnesses.

Title of thesis should be informative and relevant and preferably of one sentence/phrase without abbreviations. Introduction should include description of the problem briefly, discussion about the known things, and gaps. Review of literature should summarize the knowledge about the magnitude of the problem under consideration, discuss the relevant pathophysiology, and review available studies on the subject.

"Aims" refer to what would be achieved by this study and "Objectives" refer to what would you actually do in this study. The methodology should mention study design, sample size, and duration of study, which includes collection of data, analysis, writing, and final submission.

Results include mainly proper statistical analysis and presentation of data, but also summarize different patterns. Statistical analysis should mention procedure for data entry, statistical methods/software for statistical analysis, methods for handling missing data, etc.

Discussion is a broader-scale interpretation in relation with previous published results and Conclusion summarizes the main points of talk. Bibliography should be in Vancouver style and include references, which the candidate has accessed and read.

Organization of thesis should be proper in all aspects, such as chapter distribution and hierarchy of sections/subsections. While carrying out the project, the students put in all their learning and apply theoretical knowledge and analytical skills gained during the course to derive the solutions.

Item Analysis: An Unmatched Tool of Assessment in Medical Education

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INTRODUCTION

Multiple Choice Questions (MCQs) is one of the most commonly used tools for assessing the knowledge of medical students. Properly constructed MCQs can assess higher cognitive processing of Bloom's taxonomy. The unique advantage of MCQs is that one can get statistical information by analyzing the performance in MCQs, about how well one's questions are working, which is known as an item analysis.

OBJECTIVE

The objective of the study was to analyze and assess the quality of MCQs by item analysis for creating a viable question bank in Biochemistry and also identify the low achievers and their learning difficulties, which can be improved further.

MATERIALS AND METHODS

Assessment of 80 first professional Bachelor of Medicine and Bachelor of Surgery students was done by self-constructed 30 MCQs (items). Validity of each item was analyzed for facility value, discrimination index, and distracter efficiency.

RESULTS

Facility value or difficulty index of 76.67% items was in the acceptable range, 3.33% item were too easy, and 20% items were too difficult. Discrimination index of 26.67% items was within recommended value, 53.33% items were within acceptable range, and 20% items fell within discarded category. The majority of the items (86.67%) were with all functional distracters. Only 23.33% items have been validated for the biochemistry MCQ Bank, 56.67% items will be revalidated after revision and modification, and 20% items have been discarded.

CONCLUSION

Validated MCQs can be used as assessment tool to identify the lower ability students with learning difficulties, which could be improved by feedback, counseling, or modifying learning methods.

CVS

A Comparative Study of Fasting and Postprandial Lipid Profile in a Tertiary Care Hospital of Mumbai

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AIMS AND OBJECTIVE

Serum lipid profile has now become almost a routine test. It is usually done in the fasting state due to certain limitations in the nonfasting serum sample, as perceived by laboratory fraternity. We tested the hypothesis that levels of total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, non-HDL cholesterol, and triglycerides (TGs) either do not change or change only minimally in response to normal food intake in individuals.

MATERIALS AND METHODS

A total of 100 patients were selected for the study from the blood collection in the outpatient department of the Biochemistry Department of Grant Government Medical College, Mumbai, Maharashtra, India. Age group 25 years and above of both sexes were selected. Serum lipid profiles of 40 out of 100 patients were estimated by ADVIA 1800 autoanalyzer by enzymatic method until submission of abstract, and we will be continuing the same until data for all the 100 patients are completed.

RESULTS

We compared fasting and two-hour postprandial lipid profile level of TGs, T-cholesterol, HDL-cholesterol, LDL-cholesterol, and very low-density lipoprotein (VLDL) of 40 patients until the submission of abstract. The difference between fasting and post-prandial values for serum TGs (p-value 0.138), serum cholesterol (p-value 0.338), LDL (p-value 0.186), HDL (p-value 0.217), and VLDL (p-value 0.160) were statistically found not to be significant, i.e., these two groups were found to be similar.

CONCLUSION

If nonfasting rather than fasting lipid profiles were used, it would simplify clinical care for patients worldwide. As we detected only minimal changes in levels of lipids in response to normal food intake in the general population, changes that are clinically unimportant, the fasting requirement possibly makes blood sampling unnecessarily difficult for millions of patients worldwide.

Serum High-sensitivity C-reactive Protein and Serum Lipoprotein (a) as a Marker of Cardiovascular Risk in Patients of Psoriasis in Chhattisgarh

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INTRODUCTION

Psoriasis is a chronic immune-mediated inflammatory disorder of skin associated with high degree of morbidity and poor quality-of-life. Several studies have demonstrated that psoriasis is associated with unfavorable cardiovascular risk profile.

AIM

Was to assess serum high-sensitivity C-reactive protein (CRP) and serum lipoprotein (a) as markers of cardiovascular risk in psoriatic subjects in Chhattisgarh.

MATERIALS AND METHODS

This was a hospital-based case – control study carried out at Pt. Jawahar Lal Nehru Memorial Medical College, Raipur, Chhattisgarh, India, comparing psoriasis cases from the dermatology clinic with age- and sex-matched healthy controls. Detailed history taking and physical examination were carried out and various biochemical parameters including lipid profile, lipoprotein (a) and hs-CRP were estimated and compared with control subjects using appropriate statistical tests.

RESULTS

Patients with psoriasis were found to have significantly higher systolic blood pressure ($p = 0.005$), fasting blood glucose ($p = 0.04$), cholesterol ($p = 0.0009$), triglyceride ($p = 0.028$), very low-density lipoprotein (VLDL) ($p = 0.017$), lipoprotein (a) ($p = 0.0001$), and hs-CRP ($p = 0.014$) compared with control subjects.

CONCLUSION

Psoriatic subjects were found to possess higher cardiovascular risk compared with control subjects.

Assessment of Serum Vascular Endothelial Growth Factor (Levels in Pregnancy-induced Hypertensive Patients

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OBJECTIVE

The study aimed to assess the serum vascular endothelial growth factor (VEGF) levels in the peripheral blood of patients with pregnancy-induced hypertension (PIH) and find the association between serum VEGF levels and PIH.

MATERIALS AND METHODS

Thirty-Five PIH subjects, 35 normal pregnant females, and 20 normal healthy females were included in the study. Detailed history, clinical examination, and relevant biochemical parameters were assessed; the serum VEGF levels were estimated using double-antibody enzyme-linked immunosorbent assay.

RESULTS

The study groups were found to be age-matched ($p = 0.38$). The VEGF level in the pregnancy group was significantly lower than in the normal group, and the difference between these two groups was significant ($P < 0.0001$). The three groups are found to be significantly different in terms of random blood sugar (0.01), urea (<0.0001), creatinine (0.0005), aspartate aminotransferase

(0.0032), alanine aminotransferase (0.0007), total protein (0.0004), albumin (< 0.0001), calcium (0.001), and sodium (0.02), while no statistically significant difference was found between total bilirubin (0.167), direct bilirubin (0.07), uric acid (0.16), and potassium (0.14). Further serum VEGF level in the PIH (23.57 ± 61.6) group was found to be higher than in the pregnancy group (5.56 ± 3.22), but the difference failed to reach the statistical significance (p = 0.1).

CONCLUSION

Higher levels of serum VEGF (though not significant) were noted in PIH subjects compared with normal pregnant subjects.

A Study of Creatine Kinase Activity among Hypertensive Patients and Its Role as Predictor for Failure of Antihypertensive Therapy

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AIMS AND OBJECTIVES

High creatine kinase (CK) activity could be a genetic factor responsible for primary hypertension. The study was done to see the relation between CK and blood pressure, and CK as a prognostic marker in antihypertensive treatment. The association between body mass index and blood pressure levels was also observed.

MATERIALS AND METHODS

A total of 50 known hypertensive patients of both sexes between 25 and 60 years, who fulfilled the inclusion criteria were included in the study. An equal number of healthy control subjects was selected. Total CK activity and blood pressure were measured after excluding other risk factors that cause increase in CK. The CK was analyzed by N-acetyl cysteine -activated method using Roche Integra analyzer. Weight and height were measured and details of drug treatment were recorded. Statistical analysis for correlation and test of significance were done.

RESULTS

It was observed that there was significant difference (p < 0.01) in the means of CK level among patients and control groups and a strong positive correlation between CK and mean systolic blood pressure levels. Mean CK levels of uncontrolled hypertensive patients were significantly raised compared with patients with controlled hypertension.

CONCLUSION

The CK is increased in patients with hypertension and used as a marker for control of hypertension. Further studies need to be done to find its association in the etiology of hypertension.

Correlation of Estimated Glomerular Filtration Rate with Serum Apo B in Essential Hypertensive Patients with Apparently Normal Renal Function

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BACKGROUND

Essential hypertension is associated with left ventricular hypertrophy and is a comorbid factor for renal injury and cardiac disease. Although prevalence of hypertension is high in India, there are limited reports regarding the relationship between eGFR, apo B, dyslipidemia, and blood pressure collectively. This study aims at assessing the correlation between the above parameters in essential hypertensive patients with intact renal function.

MATERIALS AND METHODS

This case – control study includes 50 essential hypertensive patients (as per JNC 7 criteria) and 50 of age- and sex-matched healthy volunteers. Serum urea, creatinine, lipid profile, and apo B were estimated by commercial kits adapted to autoanalyzer TBA 120FR. The estimated GFR was calculated by Cockcroft–Gault equation.

RESULTS

There was a significant increase in serum urea (24 ± 10 *vs* 19 ± 3; p < 0.05), creatinine (0.8 ± 0.1 *vs* 0.7 ± 0.1; p < 0.05), eGFR (96.5 ± 16.1 *vs* 107.4 ± 22.4; p < 0.05), cholesterol (196 ± 35 *vs* 142 ± 16; p < 0.0001), triglyceride (199 ± 71 *vs* 106 ± 32; p < 0.0001), and Apo B (100 ± 13

vs 59 ± 18; p < 0.0001) among the cases when compared with controls. We observed a significant negative correlation of eGFR with serum urea (r = –0.270; p < 0.01), serum creatinine (r = –0.496; p < 0.01), and apo B (r = –0.263; p < 0.01).

CONCLUSION

Early screening of patients with essential hypertension for apoB and eGFR can reduce the incidence of chronic renal disease and cardiac disease.

Lipoprotein "a" Levels in Coronary Artery Disease among Indian Population

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OBJECTIVE

Lipoprotein "a" is a causal, genetic, independent risk factor for cardiovascular disease. The purpose of this study was to compare the serum levels of lipoprotein "a" in patients with coronary artery disease (CAD), with age- and gender-matched healthy control subjects.

MATERIALS AND METHODS

We tested 38 patients who were angiographically proven to have triple vessel disease and 28 healthy control subjects. Serum levels of lipoprotein "a" were measured using immunoturbidimetry.

RESULTS

Mean level of serum Lipoprotein "a" in patients was found to be 64.2 ± 32.5 mg/dL in cases, and 39.3 ± 20.6 mg/dL in controls, with p-value < 0.001. The receiver operating characteristic curve analysis in our study data suggests the critical value as 45 mg/dL. Fischer's exact test shows OR = 3.7; 95% CI = 1.3 – 10.5.

CONCLUSION

From the study, it has been observed that mean lipoprotein "a" levels are higher in cases, and the risk of developing CAD is higher when serum Lipoprotein "a" is elevated (OR = 3.7; 95% CI = 1.3 – 10.5; p-value < 0.021).

To Compare the Electrophoretic Pattern of Serum Lipoproteins with Lipidogram along with Changes Seen in Serum Lp(a) Levels in Type 2 Diabetes Mellitus

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OBJECTIVE

Type 2 diabetes mellitus (DM) is associated with a cluster of interrelated plasma lipid and lipoproteins abnormalities including reduced high-density lipoprotein (HDL)-C, a predominant low-density lipoprotein (LDL), and elevated triglycerides. Hyperinsulinemia and hypertriglyceridemia are independently associated with low levels of HDL, which indicate that the diabetic state itself is associated with atherogenic lipid disorders. The present study was conducted to estimate serum Lp(a) levels and compare the electrophoretic pattern of serum lipoproteins with serum very low-density lipoprotein (VLDL)-C, serum LDL-C, and serum HDL–C concentrations in patients of type II diabetes mellitus.

MATERIALS AND METHODS

Ninety age- and sex-matched individuals were included in the study, divided into three groups. Group I comprised 30 normal healthy individuals. Group II comprised 30 patients of Type 2 DM with HbA1C < 7%. Group III comprised 30 patients of Type 2 DM with HbA1C > 7%. Serum levels of fasting blood sugar, HbA1C, lipoprotein electrophoresis, serum Lp(a), and lipid profile were estimated in all the subjects under study.

RESULTS

It was observed that 40% of patients showed higher VLDL levels by lipoprotein electrophoresis as compared with only 20% of patients when estimated by Friedewald equation. Also, 56.6% had low HDL by lipoprotein electrophoresis as compared with 46.6% of patients when done by phosphotungstic acid method. Also, mean serum Lp(a) levels were increased in patients of Type 2 DM as compared with controls.

CONCLUSION

Plasma lipoprotein patterns provide a more systematic basis for classification and study of hyperlipidemia that can be achieved by lipid determinations alone. There is increase in serum Lp(a) levels with increase in HbA1C.

Significance of Altered Serum Triiodothyronine in Cases of Heart Failure

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OBJECTIVE

Thyroid hormones are abnormal in many nonthyroidal illnesses, but there are very few studies on congestive cardiac failure. Impaired thyroid function is known to affect the contractile state of the myocardium, which could accelerate the deterioration of ventricular function. The aim of the study is to determine the prevalence and significance of abnormal thyroid function in cases of congestive cardiac failure.

MATERIALS AND METHODS

About 30 cases admitted in the intensive coronary care unit with heart failure were recruited in the study. The N-terminal pro b-type natriuretic peptide (NT proBNP), thyroid profile was done, ejection fraction was noted, and these cases were classified as per the New York Heart Association classification. These cases were compared with age- and sex-matched controls. Student t-test and ROC analysis was performed. The p-value < 0.05 was considered significant.

RESULTS

The T3 concentration (1.057 ± 0.5 nmol/L) is statistically significantly low in cases as compared with normal subjects (1.68 ± 0.63). The mean, SD values of NT proBNP and TSH are 7153 ± 1428 (pg/mL) and 2.72 ± 0.31 (μIU/mL) respectively, and they are found to be significantly higher compared with controls. The ROC analysis shows area under curve for T3 and NT pro-BNP as 0.896 and 1 respectively.

CONCLUSION

This study demonstrates that the thyroid hormone metabolism is altered in patients with advanced heart failure. Thyroid hormone modulation of myocardial cell function is believed to occur through specific T3 nuclear receptor. It is possible that even in patients who appear to be "euthyroid" by T4 and TSH hormones criteria, low T3 could exacerbate heart failure and contribute to poor prognosis. Therefore, early diagnosis and treatment of hypothyroidism will reduce mortality and morbidity in heart failure patients.

Lipid Profile Alteration in Psoriatic Patients, at Risk for Cardiovascular Diseases

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OBJECTIVE

To evaluate and compare lipid profile in patients of psoriasis and its correlation with severity of the disease and associated cardiovascular diseases risk.

MATERIALS AND METHODS

A total of 50 subjects including 25 cases of psoriasis attended the dermatology clinics at Maharaja Yashwant Rao Hospital Indore, Madhya Pradesh, India, and 25 were age-, gender-matched healthy controls. Subjects were enrolled in the study as per the inclusion criteria. Severity of the disease was assessed by psoriasis area and severity index score. Fasting blood samples were collected and evaluated for lipid profile and risk ratio was calculated.

RESULTS

In our study, 15 patients were of moderate-to-severe psoriasis and 10 with mild psoriasis. Serum triglyceride (TG), total cholesterol (TC), low-density lipoprotein, and non–high-density lipoprotein (HDL)-C were significantly ($p < 0.001$) higher in moderate-to-severe cases than in control. Patients with mild psoriasis had elevated levels, but were not significant as compared with control ($p > 0.05$). The HDL–C showed significantly ($p < 0.02$) lower value than control. The TC/HDL ratio were found to be significantly

($p < 0.01$) higher in cases than control group. Total cholesterol, LDL-cholesterol, and TG showed a significant positive correlation with severity of the psoriasis.

CONCLUSION

Patients of psoriasis must be considered as a group at high risk for cardiovascular diseases. Lipid derangements correlate with the severity of disease and also act as a good prognostic sign. We conclude that psoriatic patients should be evaluated and followed up for the risk of dyslipidemia and cardiovascular morbidity.

Gender-based Assessment of Stress and its Correlation with Lipid Profile among Undergraduate Medical Students of MIMS, Mandya – A Cross-sectional Study

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OBJECTIVE

(1) To assess stress levels among male and female undergraduate medical students of MIMS, Mandya. (2) To determine correlation between stress and lipid profiles among male and female undergraduate medical students of MIMS, Mandya.

MATERIALS AND METHODS

A cross-sectional study was conducted among undergraduate medical students of MIMS, Mandya to assess stress by using The medical student's stress questionnaire. Fasting blood samples were collected to estimate lipid profile. Data were analyzed using Statistical Package for the Social Sciences version 15.

RESULTS

Among 389 students, 346 participated in the study among whom 168 were males and 178 females. It was seen that 28.7% of the students had high-to-severe stress, with females having 37.7% and males 19.1%. On correlation of stress with lipid profile, stress among females had significant positive correlation with total cholesterol ($r = 0.173$, $p = 0.021$) and low-density lipoprotein (LDL) ($r = 0.301$, $p = 0.00$) and negative correlation with high-density lipoprotein (HDL) ($r = -0.215$, $p = 0.004$). In males, there was no statistical significance of stress with lipid profile except for triglycerides ($r = -0.274$, $p = 0.00$) and LDL ($r = 0.202$, $p = 0.009$).

CONCLUSION

Stress was higher among females compared with males and showed significant correlation with lipid profile. As a whole, it is essential to bring in interventional methods to cope with stress in medical education, which, in the long run, would help in preventing development of various cardiovascular diseases.

Association of hs C-reactive Protein and Procalcitonin with Severity of Coronary Artery Disease

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AIMS AND OBJECTIVES

Vascular inflammation plays a crucial role in the pathogenesis of atherosclerosis and mediates various stages of atherosclerotic plaque development. Inflammatory biomarkers constitute valuable tools to study this process, enabling the effects of different therapeutic interventions to be assessed. In recent years, inflammatory markers, such as C-reactive protein (hsCRP) and procalcitonin have gained importance as independent predictors of cardiovascular events over and above the traditional cardiovascular risk factors. The aim of the study is to determine the relation of hsCRP and procalcitonin with severity of coronary artery disease (CAD).

MATERIALS AND METHODS

A total of 85 subjects were included in the study, who were angiographically diagnosed to be having coronary artery disease, out of which 35 are with single vessel disease (group I), 32 are with double vessel disease (DVD) (group II), and 18 with triple vessel disease (TVD) (group III). The hsCRP, procalcitonin, total cholesterol, high-density lipoprotein-C, low-density lipoprotein (LDL)-C, and triglycerides were estimated. Statistical analysis was done using Mann–Whitney U test.

RESULTS

The median and interquartile ranges of hsCRP and procalcitonin in all the three groups include 9.95(2.525–32.38), 22(14–29.3), 46.7(22.5–135) and 0.5(0.2–0.725), 0.55(0.2–0.425), 3(0.35–16.85) respectively. There are differences in hsCRP and procalcitonin values between groups II and III, also between groups I and III, but there is no difference between groups I and II.

CONCLUSION

In conclusion, serum levels of hsCRP and procalcitonin seem to be increasing with severity of coronary disease – DVD < TVD. Thus, these inflammatory markers could be used as indicators to imaging techniques for prognostication in such cases.

Fibrinogen Levels in Ischemic Stroke

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OBJECTIVE

Stroke is one of the leading causes of death and disability throughout the world. Hypertension is considered the main risk factor for cerebral thrombosis as well as cerebral hemorrhage. Several prospective trials revealed that fibrinogen has a strong predictive power in ischemic stroke, and numerous pathways have been identified through which fibrinogen can promote atherothrombosis. The aim of this study was to evaluate plasma fibrinogen levels in cerebral ischemic stroke patient within 24 hours from the time of admission.

MATERIALS AND METHODS

This is a cross-sectional study involving 20 healthy controls and 20 cerebral ischemic stroke patients, who attended our institute during June to August 2015. Risk factors like hypertension, smoking, diabetes mellitus, and lipid profiles are evaluated.

Hemorrhagic stroke, traumatic and space occupying lesions of cerebrovascular disease, patients with previous myocardial ischemia (MI) or present MI, patients with recent infections, liver disease, and renal failures are excluded.

RESULTS

The plasma fibrinogen levels were significantly increased in ischemic stroke patients when compared with controls. In the patient group, 75% with smoking, 66% with hypertension, 71% with high cholesterol, 62% with diabetes mellitus, 61.5% with low density lipoproteins, and 64.7% with high triglycerides showed increased fibrinogen levels.

CONCLUSION

Our study shows the importance of high fibrinogen levels that could be a risk factor for ischemic stroke in patients. So, measurement of fibrinogen level may benefit in detecting thrombosis, which appears to complicate with risk factors.

Low Testosterone – A New Risk Factor for Coronary Artery Disease

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OBJECTIVE

To find out whether low testosterone is a risk factor for developing coronary artery disease.

MATERIALS AND METHODS

It is a retrospective study involving 50 male subjects who were angiographically proven for coronary artery blocks, and 47 male subjects matched with coronary artery disease (CAD) patients were selected as controls for whom cardiac problems are ruled out by Echo, ECG, and clinical examination. The CAD subjects were divided into single vessel disease, double vessel disease, and triple vessel disease based on the degree of involvement of the vessels. Body mass index (BMI) was calculated using the formula BMI = weight (kg)/height^2 (m). Triglycerides (TGL) and high-density lipoprotein (HDL) were measured using the Seimens Dade Behring Xpand machine by lipoprotein lipase and Polyethylene glycol cholesterol esterase method. Testosterone was measured using the Beckman coulter machine by chemoluminescence method. Blood pressure was measured using sphygmomanometer.

RESULTS

Among the variables analyzed by independent sample t-test, TGL, HDL, BMI, diastolic blood pressure, and total testosterone showed significant p-value (>0.05). Pearson correlation analysis shows moderate correlation between total testosterone levels and BMI, TGL, HDL, and diastolic blood pressure. Total testosterone levels showed high degree of significance with the degree of CAD, the lowest being associated with triple vessel disease.

CONCLUSION

This study though consists of a small sample size clearly indicates the relationship between low normal testosterone and coronary artery blockage probably a complication of endothelial dysfunction.

A Study on High Sensitivity C-reactive Protein, Cystatin-C, and Intima Media Thickness in Offspring of Patients of Coronary Artery Disease

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INTRODUCTION

Indians are genetically susceptible to coronary artery disease (CAD) from early childhood, but high CAD rate in Indians is not fully explained by traditional risk factors, and it is likely that other factors have a role in its development. Therefore, coronary risk factors other than conventional ones might be deeply involved in the development of CAD, and which can be a target for screening population at-risk at the earliest stage.

OBJECTIVE

To study the role of hs-C-reactive protein (CRP), cystatin-C, and carotid intima media thickness in atherosclerosis, and their interrelationship as new markers of early atherosclerosis in offspring of patients of premature CAD.

MATERIALS AND METHODS

The study was carried out in the Department of Biochemistry, Maulana Azad Medical College from September 2007 to April 2009. It comprised 40 cases (Group I) and 40 subjects in control group (Group II). It is a case – control study. The parameters included were hsCRP, cystatin C, intima media thickness, and complete lipid profile. Subjects with chronic liver disease, thyroid disorders, on glucocorticoid therapy, and suffering from acute/chronic infections were excluded from the study since these factors are known to affect the parameters of our study.

RESULTS

There was significant dyslipidemia in cases as compared with controls. The low-density lipoprotein-C/high-density lipoprotein (HDL)-C ratio in cases was high (2.3 ± 0.68) than in controls (1.4 ± 0.411), $p < 0.01$. Similarly, total cholesterol (TC)/HDL-C ratio is significantly higher in cases (3.76 ± 0.78) than in controls (2.72 ± 0.47), $p < 0.01$. The hs-CRP levels in the cases were 1.2 ± 0.77 mg/L and 0.60 ± 0.18 mg/L in controls, which is significant. Cystatin-C levels were increased in cases (1.04 ± 0.32) *vs* controls (0.60 ± 0.18) ($p < 0.01$). Also, there is a significant increase in intima media thickness between cases and controls.

CONCLUSION

This study demonstrates that children of premature CAD patients have significantly increased levels of these markers, which can be a target for screening population at-risk at the earliest stage in Indian population.

Role of High-sensitivity C-reactive Protein and Atherogenic Index of Plasma as a Screening Tool for Cardiovascular Risk

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OBJECTIVE

Vascular inflammation plays an important role in all stages of the atherosclerotic process from the onset of initial lesion to plaque progression and complications. The C-reactive protein (CRP) determined by high-sensitivity methods (hsCRP) is the most extensively studied biomarker to assess cardiovascular risk. Atherogenic index of plasma (AIP) reflects the presence of highly

atherogenic lipoproteins and is a sensitive predictor of coronary atherosclerosis. The purpose of this study is to evaluate the relationship between hsCRP and AIP with coronary heart disease (CHD).

MATERIALS AND METHODS

A case – control study of 90 subjects who underwent clinical, laboratory, and angiographic evaluation were divided into three groups, healthy controls (n = 30), high-risk individuals without CHD (n = 30), and CHD cases (n = 30). Fasting levels of complete lipid profile and hsCRP were estimated in the serum samples. The AIP is calculated as log transformed ratio of (triglycerides (TG)/high-density lipoprotein (HDL).

RESULTS

The hsCRP and AIP [Log (TG/HDL)] were significantly increased in high-risk individuals without CHD and in CHD groups ($p < 0.0001$) when compared with the control group. The AIP levels were more sensitive than the total cholesterol levels. There was a positive correlation between conventional lipid parameters and hsCRP in CHD.

CONCLUSION

The present study clearly demonstrated that hsCRP and AIP levels are associated with cardiovascular risk and are linked to the pathophysiology of atherosclerosis, providing additional value in primary and secondary prevention. The combination of these evaluated markers has the potential to serve as a screening tool for cardiovascular risk assessment and clinical management.

Study of Serum Uric Acid and Magnesium in Myocardial Infarction

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OBJECTIVE

(1) To estimate serum uric acid, serum magnesium, and creatine kinase-myocardial b fraction (CK-MB) in cases; (2) To estimate serum uric acid and serum magnesium in controls; (3) To correlate and analyze the levels of these parameters in myocardial infarction (MI); and (4) To assess whether they could be a supportive diagnostic tool along with CK-MB.

MATERIALS AND METHODS

A correlative study conducted on 50 patients with clinically diagnosed MI and age- and sex-matched 50 apparently healthy subjects as controls from the general population. A 3 mL of venous blood was collected to study the serum uric acid, serum magnesium, and CK-MB levels in cases and serum uric acid and serum magnesium in controls. The tests were done on the same day after serum separation on Stat Fax 3300 semiautomated analyzer. The data were analyzed and expressed in terms of mean ± SD. Pearson's Correlation Coefficient was used to study the relationship with CK-MB.

RESULTS

There was statistically significant increase in levels of serum uric acid ($P < 0.001$) and CK-MB, and decrease in levels of serum magnesium ($P < 0.001$) in cases. Their diagnostic accuracy was 85% for serum uric acid and 81% for serum magnesium. There was highly significant positive correlation between uric acid – CK-MB levels and negative correlation between serum magnesium and CK-MB levels in MI patients.

CONCLUSION

It can be concluded that serum uric acid and serum magnesium with diagnostic utility of 85 and 81% correlated well with the conventional established cardiac biomarker CK-MB, and could be used as a good supportive diagnostic tool in MI.

Gonadotropins as Markers in Myocardial Infarction

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OBJECTIVE

To estimate the level of gonadotropins [luteinizing hormone (LH), follicle-stimulating hormone (FSH)] in myocardial infarction.

MATERIALS AND METHODS

This was a cross-sectional observational study carried out at the Department of Biochemistry, Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India. Blood samples of 30 known males (Troponin-T positive) of myocardial infarction and 30 males (controls, Troponin-T negative) were collected after informed verbal consent. The LH and FSH were measured by chemiluminescence sandwich assay in Siemens diagnostic on Advia Centaur.

RESULTS

The mean levels of serum LH and FSH in patients of myocardial infarction were 10.2 ± 5.6 mIU/m and 14.1 ± 5.0 mIU/mL respectively. The levels of LH and FSH were highly significant (p = 0.000) in patients of myocardial infarction when compared with controls.

CONCLUSION

The LH and FSH are increased in patients of myocardial infarction, as infarction is one of the major causes of primary hypogonadism in males, which results in compensatory increase in LH and FSH. The tumor necrosis factor (TNF*)* ∞ levels are increased in myocardial infarction due to inflammatory state of the disease. The TNF ∞ increases LH and FSH.

Cardiac Biomarkers – Feasibility, Utility, and Objectivity!

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INTRODUCTION

Presently, cardiovascular disorders are toward the increasing trend. Role of cardiac biomarkers (CBs) becomes pivotal in diagnosis, risk stratification, and treatment of patients with cardiac injury. Cardiac biomarkers are biomolecules, which are released into circulation in case of myocardial/cardiac injury like myocardial infarction, unstable angina, heart failure, or myocarditis.

Initially, serum glutamic oxaloacetic transaminase and lactate dehydrogenase were used in diagnosis of myocardial infarction. But, later in 1972, use of creatine kinase- myocardial b fraction revolutionized the process of diagnosis of cardiac patients, which was then taken over by Troponin (cTn) assays in 1989. Endeavors of better understanding of cardiac disease processes paved the way for introduction of newer CBs and expanded the spectrum of diagnosis of cardiac injury other than myocardial infarction like pulmonary embolism, acute heart failure, myocarditis, etc. Newer CBs can be categorized as (i) Biomarkers of inflammation like C-reactive proteins, myeloperoxidase, soluble CD 40, pregnancy-associated plasma protein A, and IL-6. (ii) Biomarkers of ischemia like ischemia-modified albumin, glycogen phosphorylase enzyme BB, and free fatty acids. (iii) Biomarkers of hemodynamic stress including brain natriuretic peptides. Progress in the feasibility and specificity of measuring troponins is driving a trend toward earlier point of care (POC) technology implementation in decision making and risk stratification. However, the panoply of putative CBs is also contributing to the emergence of cardiac POC. The cumulative information derived from a POC multimarker panel can be superior to traditional cardiac troponin (cTnI) laboratory testing. The ultimate goal of cardiac diagnosis is prevention of even a minor infarction, and, therefore, only biomarkers preceding necrosis can satisfy clinical needs. Furthermore, certain aforementioned biomarkers have shown promises for early diagnosis and prevention and certain have been approved by FDA. Moreover, full potential of these emerging biomarkers can only be realized when they will be judiciously multiplexed into POC platforms. However, simultaneous advances in assay technologies are also required so that low levels of these markers can be exquisitely detected and earliest medical interventions are employed.

Impact of Malarial Parasites on Common Lipid Parameters

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OBJECTIVE

Malaria is a parasite disease mainly seen in the tropical and subtropical regions with a major impact on public health. *Plasmodium vivax* and *Plasmodium falciparum* are the commonest parasites causing malaria. It has been observed that lipid parameters are deranged during malaria infection. The rapidly growing malarial parasite requires large amount of lipids in order to increase the membrane fluidity and volume of its internal membranes. This study hypothesized that certain serum lipid fractions may favor the onset and/or severity of malaria infection.

MATERIALS AND METHODS

Patients with clinically and laboratory confirmed malaria (n = 100) attending our hospital were selected for this study. A corresponding number of subjects without any evidence of malaria infection were used as controls. Serum lipid profile was determined in both malaria patients and controls using standardized laboratory procedures.

RESULTS

There was highly significant difference between malaria patients and controls in high-density lipoprotein (HDL) levels and total cholesterol levels ($p < 0.005$).

CONCLUSION

The total cholesterol and HDL cholesterol may be implicated in pathogenesis of malaria infection. Although a definite link with pathogenesis of malaria cannot yet be demonstrated, plausible hypothesis of biological mechanisms involving host lipid alterations and pathogenesis of malaria exist.

Paraoxonase 1 Arylesterase Activity is Protective, Myeloperoxidase is not for Myocardial Infarction

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OBJECTIVE

The objective of this study is to investigate the role of paraoxonase 1 (PON1) status, i.e., PON1 arylesterase activity and its polymorphism, serum myeloperoxidase (MPO) activity, serum advanced oxidation protein products (AOPPs), and serum Apo B in diagnosed patients of myocardial infarction (MI).

MATERIALS AND METHODS

The study group consists of 40 diagnosed patients of MI and control group consisted of healthy individuals without MI. Paraoxonase arylesterase activity was measured by using phenylacetate as substrate, and PON1 phenotyping was done by using ratio of enzyme activities using two substrates – p-nitrophenylacetate and phenylacetate. Serum MPO activity was done by using O-dianisidine as substrate. Serum AOPP was measured by modified method of Witko-Sarsat et al. Serum Apo B levels were estimated by a commercial kit based on immunoturbidometric method.

RESULTS

The PON1 arylesterase activity was significantly lesser in cases than controls. The MPO activity, AOPP, and Apo B were significantly higher in cases than controls ($p < 0.05$). There is no significant difference in phenotypic distribution among cases and controls ($p > 0.05$). ARE activities showed weak inverse correlation with serum AOPP ($R = –0.0237$, $p = 0.035$) and strong inverse correlation with serum MPO ($R = –0.444$, $p < 0.001$) and serum apo B ($R = –0.561$, $p < 0.001$). After multiple logistic regression analysis, AOPP (Nagelkerke's $r^2 = 0.274$, odds ratio = 1.262, $p < 0.001$), ARE activities (Nagelkarke's $r^2 = 0.680$, odds ratio = 0.859, $p < 0.001$), Apo B (Nagelkerke's $r^2 = 0.724$, odds ratio = 1.091, $p < 0.001$), and serum MPO (Nagelkerke's $r^2 = 0.889$, odds ratio = 9.179, $p = 0.004$) were independently indicative of the presence of MI.

CONCLUSION

The PON1 provides protection to high-density lipoprotein and low-density lipoprotein against oxidation and, hence, decreases risk of atherosclerosis and MI. The PON1 phenotypes have no role in protection against MI. This study demonstrates that PON1 arylesterase activities have a significant inverse correlation with serum MPO activities, serum AOPP levels, and serum apo B levels, which suggest that the imbalance between antioxidants and oxidants may contribute to MI. Multiple logistic regression showed these parameters were independent predictors for MI.

Effect of Serum Endothelial Lipase Levels and its Gene Variant LIPG 584C>T in Coronary Artery Disease

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OBJECTIVE

(1) To estimate the serum levels of endothelial lipase (EL), high-sensitivity C-reactive protein (hs-CRP), and lipid profile parameters in patients with coronary artery disease (CAD). (2) To study the effect of LIPG gene polymorphism 584C>T (rs2000813) on EL levels and CAD.

MATERIALS AND METHODS

A hospital-based cross-sectional study recruiting 160 subjects was conducted. Subjects were divided into four groups (40 each) on the basis of angiographic findings: Stable angina (SA), unstable angina (USA), myocardial infarction (MI), and normal. Serum EL and hs-CRP levels were estimated by using commercially available enzyme-linked immunosorbent assay kit and lipid profile parameters by enzymatic methods using Olympus 400 autoanalyzer. Presence of single-nucleotide polymorphism was detected in deoxyribonucleic acid extracted from whole blood using polymerase chain reaction–restriction fragment length polymorphism.

RESULTS

Significantly higher EL levels were seen in all cases taken together (SA+USA+MI) as compared with normal subjects (55.3 *vs* 44.45 ng/L; p-value = 0.005). Individual case group comparisons with normal subjects revealed significantly higher EL levels in USA and MI groups (p-value = 0.004 and 0.04 respectively), but not in SA group (p-value = 0.07). Also, significant negative correlation was seen between EL and high-density lipoprotein (HDL)-C levels (Spearman's correlation coefficient r = –0.396, p-value < 0.001). Evaluation of LIPG 584C/T SNP did not show any significant difference in the distribution of genotypes and alleles between cases and normal subjects.

CONCLUSION

From our findings, we conclude that EL by decreasing HDL-C levels can act as a proatherogenic factor and precipitate CAD. Also, EL can act as a novel target for HDL-C raising therapies. The study results also demonstrated that LIPG 584 C>T polymorphism has no significant effect on HDL metabolism and CAD.

Apolipoprotein A5: A Probable Cause of Hypertriglyceridemia

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OBJECTIVE

Apolipoprotein A5 (Apo A5) is a new addition to the family of apolipoproteins. Since its discovery, it has been found to be a key regulator of plasma triglycerides (TGs). Various single-nucleotide polymorphisms (SNPs) of Apo A5 have been studied for their role in hypertriglyceridemia and risk for cardiovascular diseases.

MATERIALS AND METHODS

A thorough review of literature was done by searching the research articles for gathering information of Apo A5 and its role in cardiovascular disease.

RESULTS

ApoA5 has been found to be a key modulator of plasma TGs, although its plasma concentration is very low. Conflicting theories exist regarding how Apo A5 modulates TG levels. Apo A5 either enhances the catabolism of TG-rich lipoproteins or it inhibits the rate of production of very low-density lipoprotein. The Apo A5 concentrations have been found to be affected in diabetes mellitus, which may be contributing to hypertriglyceridemia. The SNPs for Apo A5 are common in many ethnic populations. It is observed that an association exists for some of the SNPs with TGs level and atherosclerosis. The lower Apo A5 levels have also been found to correlate with high insulin levels and low high-density lipoprotein-C levels thus, increasing the risk of coronary artery disease.

CONCLUSION

Apo A5 has opened up a new avenues in lipoprotein and metabolic syndrome research considering its possible role in regulating plasma TGs and atherosclerosis. Further research may help in establishing its role as risk predictor for atherosclerosis and cardiovascular diseases.

Study of Role of Creatine Kinase-myocardial b Fraction and Troponin-T in the Early Stages of Acute Myocardial Infarction

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AIM

Myocardial infarction (MI) signifies sudden necrosis or death of a portion of cardiac muscle due to inadequate blood supply. The aim of the present study is to evaluate the role of creatine kinase-myocardial b fraction (CK-MB) and Troponin-T in the early stages of acute myocardial infarction (AMI).

MATERIALS AND METHODS

About 50 AMI patients who were admitted to the intensive care unit of the government general hospital, Kurnool, India were selected as cases in the present study. About 50 age- and sex-matched healthy individuals were selected as controls. The blood samples were taken at the time of admission within 5 to 6 hours of the start of chest pain. The samples were analyzed biochemically for CK-MB and Troponin-T by their respective methods.

RESULTS

The serum CK-MB activity in AMI patients showed an increase within 5 to 6 hours after the commencement of chest pain, and it was observed that cardiac Troponin-T levels were also elevated and correlated with the time of admission of the patient. In the control group, the Troponin-T values were within the normal range showing that cardiac Troponin-T is highly specific for cardiac tissue.

CONCLUSION

Cardiac Troponin-T has been shown to be highly sensitive for cardiac injury and not elevated in the control group. The CK-MB levels were also comparatively not elevated in the control group. Cardiac Troponin-T is ordinarily undetectable in healthy individuals, and so its measurement can serve as a powerful tool in the diagnosis of AMI.

Hypomagnesemia as a Risk Factor in Coronary Artery Diseases

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INTRODUCTION

Coronary artery disease remains the leading cause of death. The management of acute coronary artery disease involves effective intervention including reperfusion therapy and cardio protective agent. Clinical trials on magnesium demonstrated antiarrhythmic, antithrombogenic, and vasodilation effects, which limit infarct size and protect against re-infarction.

AIMS AND OBJECTIVES

To estimate and analyze serum magnesium levels in coronary artery disease patients and compare them with controls to study the relationship between serum magnesium and high-density lipoprotein (HDL) in coronary artery disease cases.

MATERIALS AND METHODS

About 50 patients diagnosed as coronary artery disease were taken in the study group and analyzed for serum magnesium and HDL levels and compared with 50 normal healthy controls. Serum magnesium was analyzed by analyzer by using Calmagite method at Central Lab, Government General Hospital, Kakinada, India.

RESULTS

Present study on coronary artery disease shows significantly decrease both magnesium and HDL levels when compared with controls, and serum magnesium was found positively correlated with HDL levels.

CONCLUSION

Dietary and plasma magnesium were strongly associated with coronary artery disease incidence. Oral magnesium treatment can improve endothelium-dependent vasodilation in coronary artery disease patients with optimal lipid values. Dietary magnesium intake was inversely associated with fatal coronary artery disease.

Homocysteine and Dyslipidemia as Risk Factors in Acute Ischemic Stroke

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OBJECTIVE

Hyperhomocysteinemia has been associated with vascular disease including cerebrovascular disease in general, particularly in subjects with significant carotid stenosis, though risk factors for carotid artery stenosis caused by atherosclerosis are known. The aim of this study was to evaluate whether homocysteine and dyslipidemia are associated with a risk of stroke.

MATERIALS AND METHODS

It is a prospective study of 48 subjects comprising 21 cases and 27 age-and sex-matched healthy controls. Fasting plasma homocysteine and lipid profile parameters were estimated by an automated analyzer. Statistical analysis was done by graph pad prism. The p-value <0.05 was taken as statistically significant.

RESULTS

Among the cases, mean±SD of age, homocysteine, total cholesterol, triglycerides, high-density lipoprotein-C low-density lipoprotein-C, and very low-density lipoprotein-C are 46.1 ± 6.8 years, 54 ± 18 µmol/L, 203 ± 41 mg/dL, 213 ± 49 mg/dL, 43.2 ± 6.6 mg/dL, 108 ± 31.2 mg/dL, 43.2 ± 12.8 mg/dL respectively, and among the controls, the values are 40.4 ± 7.3 years, 25 ± 20 µmol/L, 175 ± 41 mg/dL, 165 ± 83.1 mg/dL, 42.5 ± 12.5 mg/dL, 99.8 ± 31.9 mg/dL, 33.2 ± 16.6 mg/dL respectively. Statistical significance observed for homocysteine was (54 ± 18 *vs* 25 ± 20, p-value <0.0001) and triglycerides was (213 ± 49 *vs* 165 ± 83.1, p-value <0.01).

CONCLUSION

The present study shows significant increase in homocysteine and triglyceride levels in stroke patients when compared with healthy age- and sex-matched controls. This can be attributed to mitogenic effects of homocysteine on vascular smooth muscle, and cytotoxic, thrombophilic effects on vascular endothelium and the tissue damage itself.

Study of Homocysteine Levels in Ischemic Stroke Patients in Indian Population

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OBJECTIVE

Ischemic stroke is a complex multifactorial disease influenced by multiple genetic and environmental factors. Homocysteine is considered to be a modifiable independent risk factor for coronary artery disease, deep vein thrombosis, and stroke. The suggested mechanisms by which homocysteine induces atherosclerosis include oxidation of low-density lipoprotein cholesterol, endothelial dysfunction, increased platelet adhesion, coagulation factor activation, and proliferation of vascular smooth muscle cells. Hence, the objective of the present study was to explore the association of total homocysteine concentration with risk of ischemic stroke.

MATERIALS AND METHODS

A case – control study was conducted in the Department of Biochemistry and Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India in 30 diagnosed cases of ischemic stroke and 30 age- and sex-matched healthy controls. Plasma total homocysteine level was measured by enzymatic cycling method (DIALAB Kit).

RESULTS

Mean value of total homocysteine was found to be 30.54 μmol/L in cases and 12.04 μmol/L in control subjects. Total homocysteine level was significantly higher ($p < 0.01$) in cases as compared with controls reflecting a causal relationship between total homocysteine concentration and ischemic stroke.

CONCLUSION

The consistently high levels of plasma total homocysteine in cases suggests the need of implementation of cost-effective measures like balanced nutrition and fortification of food materials with B6, B12, and folate for prevention of hyperhomocysteinemia and its complications.

Body Mass Index and Lipid Profiles in Healthy Adolescents and Young Adults

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OBJECTIVE

This prospective study was conducted to assess serum lipid profiles in relation to body mass index (BMI) in adolescents and young adults and check if any difference exists between the groups.

MATERIALS AND METHODS

A total of 30 adolescents (10–20 years) and 30 adults (21–40 years) were included in the study. They were assessed for anthropometric measurements of weight, height, and BMI. Blood samples were collected after an overnight fast of 10 to 12 hours, and serum lipid profiles (total cholesterol (TC), high-density lipoprotein (HDL)-C, low-density lipoprotein (LDL)-C, and triglycerides (TGs) were estimated. The age groups were further divided into Group I (BMI < 24.9) and Group II (BMI > 25).

RESULTS

A total of 30 adolescents (10–20 years) and 30 adults (21–40 years) were included in the study. They were assessed for anthropometric measurements of weight, height and BMI. Blood samples were collected after an overnight fast of 10 to 12 hours and serum lipid profiles (total cholesterol (TC), HDL-C, LDL-C and triglycerides (TG)) were estimated. The age groups were further divided into Group I (BMI < 24.9) and Group II (BMI > 25).

CONCLUSION

As it is a well-known fact that basal metabolic rate decreases with age, total cholesterol, LDL, TGs were high and HDL was low only in adults of high BMI, but not in the adolescents of high BMI.

Storage Lesions and Effect of Irradiation in Context of Lipid Profile

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OBJECTIVE

When blood is stored in the blood bank prior to transfusion, there occur alterations in the biochemical and physical properties of red blood cells because of storage conditions. These are referred to as "storage lesions". The alteration in lipid profile of preirradiated and nonirradiated blood samples was observed in this study.

MATERIALS AND METHODS

Blood (450 mL) was drawn from 60 healthy volunteer donors into citrate phosphate dextrose adenine-1 anticoagulant (63 mL) with adequate safety measures to avoid contamination and infection. All subjects were serologically examined for hepatitis B virus, hepatitis C virus, and human immunodeficiency virus before blood donation. Thirty of these blood bags, group I, (randomly selected) were carefully stored in a quarantine shelf in the blood bank at 2 to 4°C while the remaining 30 bags (group II) were exposed to gamma radiation of 25 Gy and then stored in the similar manner. Effect of storage was analyzed for lipid profile at 0, 3, 7, 14, and 21 days intervals by withdrawing 8 mL blood each time from all bags in both the groups and they were compared statistically.

RESULTS

The levels of low-density lipoprotein, triglycerides, and very low-density lipoprotein were found to increase significantly ($p < 0.05$) in preirradiated samples as compared to nonirradiated ones on 14- and 21-day samples. The difference in alteration in levels of other parameters was not found to be significant between the two groups.

CONCLUSION

The alteration in lipid profile on storage after irradiation should be kept in consideration while transfusing blood to patients, especially, those with an already-compromised cardiac health.

Effect of *Myristica fragrans* on Lipid Peroxidation and Nitric Oxide Levels in Experimentally-induced Hyperlipidemia in Rabbits

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AIM

The aim of the present study was to evaluate the effect of aqueous extract from fruit of *Myristica fragrans* (MF) on lipid peroxidation and nitric oxide (NO) levels in rabbits.

MATERIALS AND METHODS

The experiment was conducted on four groups of rabbits with six animals in each group. Group I received standard pellet diet, group II aqueous extract of MF only, group III received high-fat diet (HFD), and group IV received HFD supplemented with MF. After 14 weeks of experimental period, animals were fasted overnight and blood was taken for examination for NO and malondialdehyde (MDA).

RESULTS

There was significant decrease in MDA and NO levels in group II rabbits as compared with group I. Experimentally induced hyperlipidemia in group III led to significant increase in MDA and NO levels. However, the supplementation of MF extract along with HFD led to significant decrease in MDA and NO levels as compared to group III.

CONCLUSION

The results indicate the beneficial effect of MF in ameliorating hyperlipidemia and associated oxidative stress.

Cardioprotective Effects of *Terminalia arjuna* in Rabbits

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OBJECTIVE

Terminalia arjuna is an Ayurvedic herb that has been a part of Ayurveda since prehistoric times. It is reported to possess antioxidant, hypolipidemic, and antiatherogenic properties. This study was designed to study the cardioprotective effects of *T. arjuna* in rabbits.

MATERIALS AND METHODS

In this study, twenty-four albino rabbits of either sex were used. All the rabbits were divided into 3 groups of 6 each. Group I served as control (vehicle). Group II were given isoproterenol (3 mg/kg, ip, single injection). Group III received *T. arjuna* bark alcoholic extract (200 mg/kg, po) daily for 30 days + isoproterenol on 30th day.

RESULTS

Hemodynamic, biochemical, and histological studies revealed marked protective effect of *T. arjuna* bark alcoholic extract on isoproterenol-induced myocardial necrosis in rabbit.

CONCLUSION

The study revealed that pretreatment with *T. arjuna* alcoholic bark extract provides significant cardioprotection to isoproterenol-induced myocardial damage in rabbits.

Plasma Protein C and Free Protein S Levels in Young Stroke

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INTRODUCTION

Globally, stroke is the third-commonest cause of mortality. Stroke in young is a major health problem in developing countries. According to various Indian studies, its prevalence is 25 to 34%. The causes are different in the young from those of the elderly. It may be hereditary or acquired, and in 35% cases, the cause is unknown. Among hereditary causes, Factor V Leiden mutation, protein C and protein S deficiencies, and prothrombin gene mutation are the main ones. Acquired causes are liver disease, disseminated intravascular coagulation, vitamin K deficiency, pregnancy, drugs (warfarin, oral contraceptives), postoperative period. and sepsis. Worldwide, thrombophilic factors have been implicated in 4 to 8% of young strokes.

AIM

The present study is conducted to evaluate the levels of protein C and free protein S in young stroke patients.

MATERIALS AND METHODS

The present study included clinically computed tomography scan-diagnosed 31 young stroke patients below 45 years. Protein C was estimated by chromogenic assay and free protein S by turbidometry in citrated plasma on instrumentation laboratory coagulation system.

RESULTS

The mean (±SD) age was 26.58 (±7.8 years) (Males = 19 and Females = 12). Cerebral venous thrombosis is the leading cause of stroke in our patients. We found low protein C levels in 27/31 patients. Low free protein S was found in 18/31 patients and both protein C and free protein S were low in 16.

CONCLUSION

Stroke, though common in older adults, also occurs in infants, children, and young adults. In these patients, low protein C may be secondary to increase in activation and turnover and, at the same time, may contribute to development of thrombosis. Early diagnosis and targeted therapeutic management can help such patients to prevent recurrent thrombotic episodes.

Miscellaneous

Hydroxyurea is more Effective in Younger Age of Patient of Sickle Cell Disease

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OBJECTIVE

The objective of this study was to analyze the effect of hydroxyurea on increasing the fetal hemoglobin level in sickle cell disease patients of various age groups.

MATERIALS AND METHODS

This was a retrospective cross-sectional analysis. Subjects were categorized into three groups: Age 1 to 10 years, 11 to 20 years, and >20 years. The HbF, HbA2, and S-window findings was recorded on 1st visit (registration), 2nd visit (6 months), and 3rd visit (12 months).

RESULTS

Significant difference was noted in S-window between 2nd visit ($p < 0.019$) and 3rd visit ($p < 0.019$). Corresponding increase in HbF level was noted in group I ($p < 0.001$), group II ($p < 0.0001$), and group III ($p < 0.0001$). It was noted that the increase in HbF was greater in group I (26.9 ± 25.19%) compared with group II (15.2 ± 13.8%) and group III (17.20 ± 29.9). Also, significant negative correlation (rho = –0.34, $p = 0.001$) was observed between the age and percentage increase in HbF level.

CONCLUSION

We conclude that hydroxyurea-induced rise of HbF is more prominent in young age compared with old age most probably due to the presence of higher number of HbF-producing progenitor cell populations.

To Study the Effect of Bhastrika Pranayama on Pulmonary Functions

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OBJECTIVE

Bhastrika is a type of pranayama in which subjects inhale and exhale deeply and rapidly. The study was conducted to elucidate the effects of bhastrika pranayama for 12 weeks on pulmonary function tests.

MATERIALS AND METHODS

The study included 30 medical students, both male and female of age group 17 to 21 years. Students practiced bhastrika pranayama for 25 minutes daily for 3 months. Pulmonary function test is measured before and after pranayama with the help of RMS MEDSPIROR spirometer supplied by RMS Chandigarh, India. Parameters studied were vital capacity (VC), maximum voluntary ventilation (MVV), peak expiratory flow rate (PEFR), and forced expiratory volume (FEV1)%. The data obtained were compiled and statistically analyzed by using repeated measures analysis of variance.

RESULTS

Increase in VC, MVV, PEFR, and FEV1% occurs from basal to 12 week of pranayama. The VC increases from basal (3.48 ± 0.51) to 6 weeks (3.69 ± 0.51) and at 12 week (3.95 ± 0.49). There occurs increase in MVV from basal (130.53 ± 28.06) to 6 weeks (134.5 ± 28.31) and at 12 weeks (139.6 ± 28.39). The PEFR also increases from basal (389.52 ± 83.23) to 6 weeks (406.36 ± 84.27) and at 12 weeks (422.88 ± 81.39). Also, FEV1% increases linearly from basal (84.09 ± 1.17) to 6 weeks (85.58 ± 1.29) and at 12 weeks (87.73 ± 1.23). Significant increase (p-value < 0.01) in the VC, MVV, PEFR, and FEV1% was observed following bhastrika pranayama for 3 months.

CONCLUSION

Bhastrika pranayama plays a significant role in increasing the VC, MVV, PEFR, and FEV1% in normal subjects. Development of respiratory musculature occurs following the regular practice of bhastrika, which leads to increase in VC, MVV, PEFR, and FEV1%.

Autologous Platelet Derived Growth Factors in Platelet-rich Plasma and Mesenchymal Stem Cells as Treatment of Chronic Nonhealing Ulcers

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OBJECTIVE

To investigate the therapeutic benefit of combined treatment of platelet derived growth factors and mesenchymal stem cell on chronic nonhealing ulcer.

MATERIALS AND METHODS

Totally, 15 subjects with nonhealing ulcer with duration more than 6 months were included in this study. Detailed history, clinical examination, and biochemical and hematological parameters were assessed. All the subjects were treated with local application of ointment prepared with autologous white buffy coat (source of mesenchymal stem cells) and platelet-rich plasma with antibiotic under aseptic condition. Progress of ulcer healing with duration and treatment were recorded photographically during each visit. Appearance of signs of healing was considered as success, complete healing was considered as end point, and absence of any signs of healing was considered a failure.

RESULTS

Three subjects (20%) of the total 15 treated subjects showed complete healing at first follow-up and 11 more subjects (73.33%) showed signs of wound healing. Failure was reported in 1 subject (6.66%).

CONCLUSION

Combined treatment with autologous platelet derived growth factors and mesenchymal stem cells is associated with improved rate and speed of ulcer healing in chronic nonhealing ulcer.

Beta-globin Gene Cluster Haplotypes among Sickle Cell Disease Patients and their Association with the Clinical Presentations

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OBJECTIVE

Sickle cell anemia is an autosomal recessive disease and is most common in sub-Saharan Africa, India, and the Middle East. The present study is aimed to analyze the hemoglobin beta (HBB) gene cluster haplotypes in sickle cell disease patients of Chhattisgarh state.

MATERIALS AND METHODS

About 54 known SS-sickle cell disease (SCD) patients visiting the sickle cell institute Chhattisgarh at the outpatient department were included in the study. After obtaining informed consent, 3 mL of blood sample was collected from each participant. The deoxyribonucleic acid was extracted from each sample and genotyped for HincII 5′ to ε (5′ε-HincII), XmnI5′Gγ (5′Gγ-XmnI), HindIII at the IVS of Gγglobin (Gγ-IVS II-HindIII) and AγGlobin (Aγ-IVS-HindIII), HincII5′ψβ-globin (5ψβ-HincII), HincII site 3′ ψβ-globin (3′ψβ-HincII), HinfI 5′β-globin (5′β-HinfI), AvaII within IVS II β and HbS allele using polymerase chain reaction–restriction fragment length polymorphism. Clinical data along with biochemical and hematological variables were collected from the patient records.

RESULTS

The haplotype pattern observed in our samples revealed that 100% of our SCD patients carried the Arab–Indian haplotype. The fetal hemoglobin (HbF %) is 19.5 ± 7.19, which is much higher than the SCD patients present in the rest of the world. Clinical presentation of these patients is diverse ranging from less frequent dactylitis (1.8%), acute abdominal pain (1.8%), hepatomegaly (5.4%) and splenomegaly (12.5%) to more frequent symptoms, such as pain in hip region (17.9%), jaundice (33.9%), and pallor (69.6%). About 35.7% are in sickle cell crisis.

CONCLUSION

This study revealed the clinical spectrum of Arab–Indian haplotype present in SCD patients. Analysis of more patients may help us in understanding its clinical course in the local populations.

Treatment of Early Stage Osteonecrosis of the Femoral Head in Sickle Cell Disease with Implantation of Autologous Peripheral Blood Mesenchymal Stem Cells – A Pilot Study

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OBJECTIVE

We were to assess the effect of peripheral blood mesenchymal stem cells (PB-MSC) in the treatment of early stage osteonecrosis of femoral head (OFH) in sickle cell disease (SCD) patients.

MATERIALS AND METHODS

This hospital-based interventional trial included 10 subjects/hips with OFH, aged between 15 and 45 years with associated sickle cell disease/concomitant α-thalassemia. Patients with hips at stages IC to IIC according to Association Research Circulation Osseous (ARCO) classification were included in the study. Study was approved by the institutional stem cell committee and institutional ethical committee. After obtaining informed written consent, white buffy coat and plasma were separated from 50 mL of blood from subject and MSCs were quantified by standardized protocol under strict aseptic precautions. C-arm guided core decompression was performed, and PB-MSCs were injected into the femoral head. Patients were observed with proposed

follow-up at 6 weeks, 3 months, 6 months, 1 year, and then annually, thereafter, for 10 years. Improvement in ARCO staging/no need of surgery at the end of 10 years was/will be taken as end point. Improvement in Harris hip score was treated as success of the procedure.

RESULTS

Out of 10 subjects treated, improvement was noted in ARCO staging in 5 (50%) in first follow-up and 2 (20%) in second follow-up. All the 10 (100%) showed improvement in Harris hip scores.

CONCLUSION

The PB-MSC in treatment of early stage OFH in SCD patients is associated with significant improved rate of recovery and better outcome at least in short term follow-up.

To Find Out the Effect of Various Phases of Menstrual Cycle on Systems Other than Reproductive System like Respiratory System and Nasal Mucosa

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OBJECTIVE

To find out the effect of various phases of menstrual cycle on systems other than reproductive system like respiratory system and nasal mucosa.

MATERIALS AND METHODS

Study was performed in two menstrual cycles on the same 30 healthy female medical students of 18 to 24 years having regular menstrual cycles. NMC and peak expiratory flow rate (PEFR) time was recorded during menstrual (2nd to 4th day), proliferative (9th to 12th day), and luteal phases (19th to 21st day) of two cycles and mean of both cycles was considered. The NMC time was assessed by Andersen's saccharin technique and PEFR was recorded by using Wright's peak expiratory flowmeter.

RESULTS

The mean values of NMC of two menstrual cycles were 10.81 ± 2.143, 8.233 ± 1.942 and 11.12 ± 2.118 in menstrual, proliferative, and luteal phases respectively. On comparing proliferative phase with menstrual and luteal phases, NMC time difference was highly significant, ($p < 0.001$) and when luteal and menstrual phases were compared, results were not significant ($p > 0.05$). Mean values of PEFR were 335.8 ± 30.85, 340.4 ± 29.73 and 384.1 ± 26.41 in menstrual, proliferative, and luteal phases respectively. On comparing luteal phase with menstrual and proliferative phases, PEFR difference was highly significant ($p < 0.001$) and when proliferative and menstrual phases were compared, results were insignificant ($p > 0.05$).

CONCLUSION

Nasal mucociliary clearance time was significantly less in proliferative phase and peak expiratory flow rate was significantly more in luteal phase when compared with other two phases in both menstrual cycles. Thus, various phases of menstrual cycle also affect respiratory system and nasal mucosa.

Acute Intermittent Porphyria (AIP) – A Diagnostic Dilemma

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OBJECTIVE

Acute intermittent porphyria (AIP) is a disease of heme biosynthesis characterized by increased excretion of porphyrins or porphyrin precursors in urine or feces. We will present an unusual case of AIP and the diagnostic dilemma we faced to treat and its biochemical implications.

MATERIALS AND METHODS

A 9-year-old male child was treated in two private hospitals due to painful abdomen and nonbilious vomiting as a case of intestinal obstruction. He was administered antibiotics and analgesics for the same. He also developed convulsions and anticonvulsants were given. He was shifted to our hospital on day 20th of his worsening condition when he developed muscle weakness and severe

pain in limbs associated with hypertension. His skeletal survey and investigations for connective tissue disorders were normal. The computed tomography of the abdomen and Doppler for renal vessels were also normal. Vitamins C and D were given to rule out vitamin C deficiency pseudo paralysis. His neuropathic symptoms were not matching with Guillain-Barré syndrome or other polyneuropathy. At this juncture, his urine was examined for porphyrins and qualitative/quantitative analyses for porphyrins were strongly positive. Genetic testing confirmed the diagnosis and proper treatment was started and, presently, patient is improving.

RESULTS

The patient is symptom-free with the start of treatment. Unfortunately, his mother and two younger siblings are also positive for the mutation of AIP, so the parents have been counseled regarding the disease and how to avoid the precipitating factors and drugs.

CONCLUSION

Acute intermittent porphyria is a disease of a high index of suspicion from the clinical side, and the medical biochemist has a tremendous role to confirm it by laboratory tests. Only good lab tests by experts can confirm the diagnosis together with genetic tests.

Hypomagnesemia in Acute Emergencies – an Observational Study

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OBJECTIVE

Magnesium is the fourth-most common cation in the body having numerous physiological functions in both health and disease. Hypomagnesemia is an electrolyte disturbance in which there is an abnormally low level of magnesium in the blood. Normal magnesium levels in humans fall between 1.9–2.5 mg/dL. This study was done to estimate total serum magnesium levels in acute emergencies.

MATERIALS AND METHODS

This study was undertaken in tertiary care of Osmania General Hospital in patients admitted in the acute medical emergency care where acutely ill patients (n = 60) were enrolled at the time of admission. Serum magnesium was estimated colorimetrically by xylidyl blue method. Statistical analysis was done using unpaired t-test.

RESULTS

Based on the levels of serum magnesium, the patients (n = 60) were divided into two groups: Group-I (normomagnesemia 1.9–2.5 mg/dL) and group-II (hypomagnesemia <1.9 mg/dL). The results showed that the percentage of patients in group-I was 36.7% (n = 22) and in group-II was 63.5% (n = 38). Mean±SD of group-I was 2.18 ± 0.179 and in group-II was 1.61 ± 0.185. The groups-I and II were statistically significant ($p < 0.0001$).

CONCLUSION

In this present study, the incidence of hypomagnesemia in most of the acute emergencies is high. Patients coming to emergencies are predisposed to symptomatic or asymptomatic magnesium deficiency that can lead to important clinical consequences. Thus, monitoring serum magnesium may have prognostic and therapeutic implications.

A Case of Parotid Duct Calculus

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INTRODUCTION

Sialolithiasis is caused by partial deposition of calcific materials in salivary glands or ducts, causing symptoms, especially, swelling and pain. As it does not develop frequently, the exact formation mechanism is yet to be identified.

CASE REPORT

A 30-year-female presented to surgery outpatient department with pain and swelling in left cheek since 5 years. She is a nondiabetic, nonsmoker, and nonoral tobacco abuser. Parotid duct calculus was diagnosed after clinical examination and investigations. Stenson's docholithotomy surgery was performed and calculus was sent for biochemical analysis.

Calculus was the size of 1.8 × 1.3 cm, rugged surface, stony hard consistency, and brownish grey colored. Wet biochemical analysis showed presence of calcium, carbonates, and oxalates, whereas semiquantitative analysis by Fourier transform infra red spectroscopy (FTIR) revealed composition of 70% carbonate apatite and 30% ammonium, magnesium, and phosphate hexahydrate.

CONCLUSION

Wet analysis was the routine procedure for calculi analysis, but has been replaced by a more sensitive semiquantitative procedure, the FTIR. In the present case, there was a minor discrepancy in the result given by both tests. This may be mostly due to library incompleteness of FTIR for salivary calculi. Thus, a combination of FTIR and biochemical analyses will help for obtaining better results and to understand etiology.

Estimation of Serum Copper/Zinc Ratio and Iron Status in Pediatric Thalassemia and Sickle Cell Disease Patients

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OBJECTIVE

To find out correlation between serum copper/zinc ratio and iron status in pediatric patients diagnosed as thalassemia and sickle cell disease.

MATERIALS AND METHODS

This observational study is carried out in the thalassemia ward of the pediatrics department, and laboratory investigations are carried out in the advanced clinical biochemistry laboratory, AMCH from May 2014 to June 2015. A total of 100 cases (62 thalassemia and 38 sickle cell disease) were enrolled for study. Serum copper, zinc, iron, and total iron binding capacity (TIBC) were estimated in a semiautoanalyzer by colorimetric method, and ferritin estimated by immunoradiometric assay using specific reagent kit.

RESULTS

Mean ± SD of copper, iron, and ferritin are found to increase, whereas that of zinc and TIBC found to be decreased in both the groups. Serum copper/zinc ratio is found to have positive correlation with ferritin and iron, whereas there is negative correlation with TIBC in both the study groups, which are statistically highly significant with $p < 0.0001$.

CONCLUSION

Estimation of copper/zinc ratio and iron status can be valuable adjuncts to curative management of patients diagnosed as thalassemia and sickle cell disease. Careful monitoring of these parameters can help to improve the quality-of-life of these patients by proper nutrient supplement and chelation therapy.

A Rare Case of Monoclonal Light Chain Gammopathy

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INTRODUCTION

Multiple myeloma, a proliferative disease of plasma cells, results in secretion of monoclonal immunoglobulins of varying types and free light chains. Occasionally, malignant plasma cells make only the light chain component of the antibody; such patients are said to have light chain myeloma, where light chains are excreted in urine and identified by urine electrophoresis.

CASE REPORT

A 55-year–old male presented to the medical outpatient department complaining of shortness of breath (SOB) and generalized weakness. O/E: No significant findings were present.

INVESTIGATIONS

The complete blood count showed Hb: 3.6 gm%, white blood cells – 40,000 cells/mm^3, platelets – 0.25 lakhs/mm^3 plasmacytoid cells with impression of plasma cell leukemia. Serum total protein – 6.1 gm/dL, Serum albumin – 3.7 gm/dL, Serum Alkaline phosphatase – 175 U/L, other biochemical parameters were within normal limits. The solid-phase extraction (SPE) showed Albumin – 3.7 gm/dL, α1 – 0.28 gm/dL, α2 – 0.76 gm/dL, β –0.55 gm/dL, γ – 0.68 gm/dL, and very faint band in γ region.

The UPE showed a discrete band in γ region, IFE showed band in κ lane, serum free light chain (sFLC) quantification showed κ chains 9,560 mg/dL, and λ chain 5.14 mg/dL, with κ:λ ratio at 1859.9:1. The X-ray of skull showed multiple radiolucencies. The bone marrow aspiration showed 80% plasmacytoid cells.

DISCUSSION

A 55–year-old male presenting with SOB, on evaluation was found with severe anemia and plasma cell leukemia; the SPE showed a faint band in γ region, the UPE showed a prominent band in γ region after which, serum IFE was done showing band in κ lane. The sFLC quantification showed increased κ-light chain and κ:λ ratio. Thus, a combination of sFLC and electrophoresis aided in diagnosing the patient as a case of light chain multiple myeloma.

Study of Serum Calcium and Serum Phosphorus Levels in Patients of Thalassemia Receiving Repeated Blood Transfusion

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INTRODUCTION

Repeated blood transfusion in thalassemia patients results in iron overload. Excess iron gets deposited in the parathyroid glands, which results in parathyroid dysfunction, which may alter the serum calcium levels.

OBJECTIVE

(1) To determine the levels of serum calcium and serum phosphorus in patients of thalassemia receiving repeated blood transfusion. (2) To compare the levels of serum calcium and phosphorus in thalassemia patients and age- and sex-matched controls.

MATERIALS AND METHODS

About 20 patients of thalassemia, receiving repeated blood transfusion (group I) and 20 age- and sex-matched controls (group II) were included in this study. In both these groups, serum calcium and serum phosphorus levels were checked using Arsenazo III and UV molybdate method respectively. Data were compared and analyzed using student t-test.

RESULTS

It was found that the serum calcium levels were lower in group I patients (7.1 ± 1.24) compared with group II (9.2 ± 0.68), and found to be statistically significant; p-value < 0.05, but there was no significant alteration in serum phosphorus levels in group I patients (3.9 ± 0.36) compared with group II (4.0 ± 0.29) p-value > 1.

CONCLUSION

The serum calcium levels in patients of thalassemia receiving repeated blood transfusions is significantly lower compared with age- and sex-matched controls. It is due to iron overload in patients receiving repeated blood transfusion, which alters the function of parathyroid gland and finally results in hypocalcemia. So, it is important to check the serum calcium levels in patients of thalassemia receiving repeated blood transfusions.

Correlation between Vitreous Humor Potassium and Time since Death

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OBJECTIVE

In forensic medicine, the estimation of time since death plays an important role. Vitreous humor is a fluid, i.e., relatively well protected from postmortem degradation and contamination. The present study was conducted to assess the level of potassium in vitreous humor and determine the time since death.

MATERIALS AND METHODS

About 50 cases brought to the mortuary at Osmania general hospital, Hyderabad, India formed the material for collection of vitreous humor. Information regarding time of death was gathered. Analysis was done immediately after the vitreous humor aspiration. Samples for vitreous humor potassium were analyzed by ion selective method. Cases were divided into five groups according to time since death and analyzed statistically.

RESULTS

The postmortem interval varied from 5.15 to 72.45 hours. Vitreous humor potassium levels were significantly increased ($p < 0.0001$) with increased time since death. There is a linear rise in potassium concentration with increasing time since death, and this increase in the level was independent of the factors like age and sex.

CONCLUSION

There is a linear relationship between vitreous potassium and time since death. After death, the Na^+–K^+ pump does not operate; therefore, K^+ is leaked out of the retinal cells, leading to high postmortem levels. Vitreous humor potassium levels are useful and can afford a good method of determining time since death along with other traditional methods.

Biochemical Profile in Hemophagocytic Lymphohistiocytosis

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OBJECTIVE

Hemophagocytic Lymphohistiocytosis (HLH) is a fatal condition that occurs due to a defect in inflammatory signals resulting in uncontrolled hypercytokinemia. This disorder is likely to be underdiagnosed and can result in end-organ damage and death. The biochemical profile consisting of study of triglycerides, ferritin, and fibrinogen with respect to elevation of the former two and decrease in the latter is a red herring and significantly pathognomonic of the disease. Genetic types occur due to the mutation in different proteins involved in granule exocytosis and perforin-dependent induction of target cell apoptosis. Genetic forms are subdivided into familial HLH and HLH associated with primary immunodeficiency syndrome. Acquired HLH occurs due to viral, bacterial, parasitic, and also HLH associated with autoimmune diseases. The aim of identification of the altered biochemical parameters at the earliest narrows down the diagnosis of the condition, along with other hematological parameters.

MATERIALS AND METHODS

The present study was done on 6 pediatric cases below 5 years of age and 2 adults. The biochemical parameters analyzed were triglycerides, ferritin, and fibrinogen, as per the current diagnostic criteria for HLH.

RESULTS

Of 8 cases, 4 cases fulfilled the criteria of HLH. One pediatric case was genetically proven and 3 others, of which 2 were adults, diagnosed as acquired HLH.

CONCLUSION

As the prognosis for HLH is moderate-to-poor, early diagnosis of the disease helps in timely commencement of treatment to control and suppress hyperinflammation. The biochemical markers, namely triglycerides, ferritin, and fibrinogen are significant in early diagnosis and monitoring.

A Comparative Study of Myoinositol *vs* Metformin On Biochemical Profile in Polycystic Ovarian Syndrome in Women

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OBJECTIVE

Polycystic ovary syndrome (PCOS) is a common endocrine disorder in women of reproductive age associated with insulin resistance. Metformin and Myoinositol being insulin sensitizers improve biochemical, clinical, and reproductive parameters in PCOS. This study was done to compare the effects of these drugs on the biochemical profile in PCOS.

MATERIALS AND METHODS

A prospective, open-labeled, randomized, comparative, clinical study was conducted on 60 patients. The patients were randomly divided in two groups of 30 each to receive either of the following two treatments: Group I: Tab myoinositol 1 g twice daily. Group II: Tab metformin 500 mg thrice daily for 24 weeks. Biochemical profile was assessed by measuring fasting blood sugar, insulin levels, and calculating glucose/insulin ratio and homeostatic model assessment-insulin resistance (HOMA-IR) index at baseline and subsequently at the end of 12 weeks and 24 weeks. Serum lipid profile was also assessed at the same time intervals.

RESULTS

In both the groups, there was statistically significant improvement in insulin resistance as measured by glucose/insulin ratio and HOMA-IR over a period of 24 weeks. In group I, the values for glucose/insulin ratio at baseline, 12 weeks, and 24 weeks were 6.77 ± 5.4, 6.9 ± 5.05, and 7.87 ± 5.65, while in group II, the values were 5.5 ± 2.31, 6.33 ± 2.65, and 6.90 ± 2.60 respectively. In group I, HOMA-IR values were 4.18 ± 2.29, 3.52 ± 1.80, and 2.88 ± 1.52, while in group II 4.38 ± 2.36, 3.55 ± 1.99, 2.99 ± 1.60 at baseline, 12 weeks, and 24 weeks respectively. Lipid profile was also improved in both the groups. However, on comparing both the groups at 12 and 24 weeks, no statistically significant difference was observed in all the parameters.

CONCLUSION

There was a definite improvement in biochemical profile with both metformin and myoinositol, but on comparing these drugs, no significant difference was observed. Thus, myoinositol can be a new addition in the armamentarium for the treatment of PCOS.

Serum Leptin and Lipid Profile in Psoriasis: A Case Control Study

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OBJECTIVE

Psoriasis is a common chronic inflammatory disease involving the skin and mucous membranes. Its etiology is autoimmune. Various cytokines are involved in psoriasis. Leptin, an adipocyte-derived hormone, plays a role in immune responses and promotes autoimmunity. Dyslipidemia is also associated with psoriasis. So, we conducted this study to determine serum leptin levels and lipid profile in psoriasis patients.

MATERIALS AND METHODS

We conducted a prospective case control study from February 2014 to March 2015 on 30 patients of psoriasis and 30 age- and sex-matched healthy control subjects. We measured serum leptin levels by enzyme-linked immunosorbent assay technique and lipid profile by enzymatic method.

RESULTS

Serum leptin and lipid profile of total 60 subjects, 30 patients of psoriasis and 30 age-and sex-matched healthy volunteers, were analyzed in this study. Leptin level was found to be significantly higher in psoriasis group as compared with healthy volunteers ($p = 0.016$). We also found positive correlation between psoriasis area severity index in patients and serum leptin level. Among lipid profile parameters, total cholesterol and triglycerides were significantly higher in psoriasis group compared with healthy control (p-value = 0.08 and 0.00 respectively). High-density lipoprotein, low-density lipoprotein, and very low-density lipoprotein were comparable between psoriasis and healthy control group.

CONCLUSION

Hyperleptinemia is associated with psoriasis. It may have role in the pathogenesis or severity of psoriasis. Further large-scale studies are required to prove it. Dyslipidemia is also common in psoriasis. We recommend early monitoring of lipid profile in these patients.

Biochemical Parameters Changes in Birth Asphyxia

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OBJECTIVE

Birth asphyxia is one of the most troublesome problem faced by the neonatologists, which not only poses an immediate danger to the life of the neonate, but also leaves the child with severe degree of morbidities once the child is saved. Sincere monitoring of various biochemical parameters in babies with birth asphyxia may forewarn neonatologists regarding various complications. Hence, this study was planned to study correlation of various biochemical parameters with the severity of birth asphyxia.

MATERIALS AND METHODS

This was a retrospective study. Relevant data were collected and analyzed for 100 babies admitted in neonatal intensive care unit for severe birth asphyxia during March to September 2015.

RESULTS

About 60 babies were male. About 63 were preterm, 58 were low birthweight, 19 were stage-I hypoxic ischemic encephalopathy (HIE), 71 were stage-II, and 10 were stage-III HIE. Urea and creatinine were normal in all the stage-I babies, while they were deranged in 29 of stage-II patients. All the 10 patients of stage-III had deranged urea and creatinine levels. The serum glutamic oxaloacetic transaminase/serum glutamic pyruvic transaminase levels were normal in all the stage-I babies while deranged in 21 and 10 babies having stage-II and stage-III HIE respectively.

CONCLUSION

Babies with birth asphyxia should ideally be admitted in NICU, and their biochemical parameters need close monitoring so that vital organ dysfunction could be spotted earlier and required action may be taken promptly.

Role of Systemic Renin–Angiotensin–Aldosterone Activation in Chronic Obstructive Pulmonary Disease-induced Pulmonary Hypertension

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OBJECTIVE

Systemic renin–angiotensin–aldosterone system (RAAS) gets activated in chronic obstructive pulmonary disease (COPD). The aim of present study was to find the role of systemic RAAS activation in COPD-induced pulmonary hypertension.

MATERIALS AND METHODS

The study we conducted was a prospective observational study. We enrolled chronic stable COPD patients without any cardiovascular disease and age- and sex-matched healthy volunteers. The patients were undergoing spirometry, echocardiography, and estimation of angiotensin-converting enzymes, angiotensin II, and aldosterone was performed.

RESULTS

Thirty-two COPD patients and nine controls were included in this study. The data were expressed as mean ± SD. In controls, plasma acetylcholinesterase activity was (41.2 ± 15.22 IU/L), while in COPD, it was (51.12 ± 26.9 IU/L). There was no significant difference between plasma aldosterone levels in cases and controls, but, in some cases, it was disproportionately high. In controls, plasma aldosterone was (57.24 ± 18.99) and in COPD (152.31 ± 364.2), the plasma level of aldosterone by student t-test shows ($p < 0.01$). In controls, plasma angiotensin II level was (0.37 ± 0.30 mg/dL), while in COPD, it was (4.9 3.8 mg/dL). The plasma angiotensin II levels were significantly higher ($p < 0.001$) in COPD cases as compared with controls. The mean pulmonary arterial pressure (MPAP) in COPD cases was (34.53 ± 7.70 mm Hg).

CONCLUSION

The result of present study shows that there is direct correlation of angiotensin II with MPAP in stable COPD patients.

To Compare the HbF Levels, RBC Indices, and Na^+–K^+ ATPase Activity of Sickle Cell Disease Taking Hydroxyurea in Comparison with Patients without Hydroxyurea Therapy

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OBJECTIVE

To compare the HbF levels, (RBC) Indices, and Na^+–K^+ ATPase activity of sickle cell disease (SCD) taking hydroxyurea in comparison with patients without hydroxyurea (HU) therapy.

MATERIALS AND METHODS

The study was done in the Department of Biochemistry, Pt. Jawahar Lal Nehru Memorial Medical College Raipur, India after getting approval by the institutional ethics committee. The study group comprised 80 subjects, out of which 20 were suffering from SCD but without HU therapy, 20 SCD with HU therapy, 20 were AS, and 20 were AA taken as control group (healthy age

matched, having no blood disorder). Written consent was also obtained before starting the study. The HbF level was measured by Biorad Hb Variants high performance liquid chromatography analyzer and RBC indices were measured by using Mindray BD – 300 plus cell counter. Erythrocyte membrane Na^+–K^+ ATPase activity was measured in the form of released of inorganic phosphate measured by Fiske Subbarow and Lowry's principle. Statistical analysis was done using Statistical Package for the Social Sciences version 13. Unpaired Student's t-test, Analysis of variance, and *Post hoc* Bonferroni test were used to analyze the data.

RESULTS

The HbF level in SCD with HU significantly increased ($F = 170.208$, $p < 0.0001$). Na^+–K^+ ATPase activity was decreased in SCD with HU; patient was found to be significant ($F = 23.629$, $p < 0.0001$).

CONCLUSION

The HU has become the front-line drug in treatment of SCD. In this study, we found increase in total HbF concentration. No significant alteration in the RBC indices was observed. A decrease in erythrocyte membrane Na^+–K^+ ATPase activity was found in patient undergoing HU therapy, which was statistically significant.

Galvanic Skin Response in Patients with Cervical Spondylosis

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AIMS AND OBJECTIVE

To assess the level of sympathetic autonomic activity in patients with cervical spondylosis by studying the galvanic skin response (GSR).

MATERIALS AND METHODS

This prospective random case – control study was conducted in the Department of Physiology in collaboration with Department of Orthopedics, Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India in 30 patients with cervical spondylosis and 30 randomly selected age- and sex-matched healthy controls (age group 30–60 years of either sex). Basal values of GSR were recorded under resting conditions and compared. Electrolyte (Na^+ and Cl^-) levels were assessed in cases and controls to see any impact on GSR. Statistical analysis was done by using student t-test. Level of significance was determined at $p < 0.05$.

RESULTS

In patients with cervical spondylosis, the GSR values were significantly higher than in control group.

CONCLUSION

Galvanic skin response is an electro-dermal response, which determines the change in electric conductivity of the skin caused by increase in activity of sweat glands. Tonic skin conductance varies with sympathetic activity. High values of absolute skin conductance measured in microsiemens (μS) in our study implies a higher level of sympathetic tone in patients with cervical spondylosis as compared with healthy individuals.

Safeguarding Lipid Profile and Blood Glucose Levels within Normal Limits Goes a Long Way in Preventing Periodontitis

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OBJECTIVE

Previous studies have already established the association of obesity and diabetes with periodontitis. This study was undertaken to uncover the role of significant routine blood parameters like lipid profile (LP) and random blood glucose (RBG) levels in the patients attending periodontal clinic in Pt. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, India instigating importance of their maintenance in the productive prevention of periodontitis.

MATERIALS AND METHODS

Blood samples of 90 patients of periodontitis and 50 controls of age ranging from 20 to 70 years, average 42 years were analyzed for LP and RBG levels; height, hip, waist, and weight measurements were taken for calculation of obesity parameters like body

mass index (BMI) and waist–hip ratio (WHR). Mild, moderate, and severe grades of periodontitis were assigned according to probing pocket depth, probing attachment level, furcation involvement, and tooth mobility.

RESULTS

Statistical analysis of binary logistic regression analysis showed significant association of serum low-density lipoprotein cholesterol and RBG levels, whereas BMI and WHR were insignificantly associated with different grades of periodontitis.

CONCLUSION

Safeguarding LP and RBG levels within normal limits goes a long way in preventing oral diseases like periodontitis irrespective of obesity parameters like BMI or WHR.

Effect of Electromagnetic Waves Emitted from Mobile Phone on Conduction Velocity in Median Nerve

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OBJECTIVE

To study the acute effect of electromagnetic waves (EMW) emitted from mobile phone (MP) on conduction velocity in median nerve, before and after exposure to MP.

MATERIALS AND METHODS

Thirty healthy male subjects in the age group 18 to 40 years were included from staff members, friends, and healthy attendants accompanying the patients coming to the institute, who were using the MP for a minimum period of 30 minutes per day at least for the last 5 years. Subjects were explained all about the procedure and written consents were taken. Nerve conduction velocity was measured in MP users by using RMS EMG EP MK2. The basic parameters like height, weight, heart rate, blood pressure, and respiratory rate were recorded prior to the exposure. The motor conduction velocity in median nerve was recorded before and after the exposure to EMW emitted from MP. The basic parameters like heart rate, blood pressure, and respiratory rate were again recorded after the exposure to EMW. At the end of the study, data were compiled and statistically analyzed using paired samples test.

RESULTS

The study revealed statistically highly significant ($p < 0.01$) decrease in motor conduction velocity in median nerve of upper limb used to hold the MP near to the ear.

CONCLUSION

The EMW emitted from MP affects motor conduction velocity in median nerve of upper limb used to hold the MP near to the ear.

A Patient Presenting as Multiple Fractures Diagnosed as Osteogenesis Imperfecta: A Case Report

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OBJECTIVE

To diagnose rare diseases early, so that complications can be minimized by timely treatment.

MATERIALS AND METHODS

We report a case of a 17-year-old female, who presented to us with multiple fractures since childhood. Fractures occurred even after minor trauma. On clinical examination and investigations, X-ray shows multiple fractures in different healing stages. Serum alkaline phosphatase was very high. Serum calcium toward lower side and serum phosphate slightly increased. Sclera were of blue color.

RESULTS

All these finding were suggestive of osteogenesis imperfecta, a rare disease.

CONCLUSION

Osteogenesis imperfecta is a rare disorder, and there is no definitive treatment for this. However, if diagnosed early, biphosphonate treatment can be given to strengthen the bones.

Salivary Lactate Dehydrogenase in Periodontitis Patients in Population of Haryana

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OBJECTIVE

Periodontitis is a chronic inflammatory disease associated with destruction of gingival tissue resulting in release of various enzymes in saliva. out of various enzymes, serum lactate dehydrogenase (LDH) can help in monitoring the progression of periodontal disease. Saliva possesses simple and noninvasive collection with low-cost storage. Therefore, the present study was planned to evaluate LDH levels in saliva of periodontitis patients in a population of Haryana.

MATERIALS AND METHODS

A total of 100 subjects were included in the study. Out of these, 50 were healthy controls and 50 were periodontitis patients. The LDH level was estimated by UV method on Randox Suzuka autoanalyzer

RESULTS

Patients in periodontitis group showed a significant increase in serum LDH levels (440.52 ± 66.55 IU/L) when compared with controls (43.68 ± 47.28 IU/L) with significant p-value < 0.05.

CONCLUSION

On the basis of results of this study, it can be concluded that LDH levels were significantly raised due to pathological processes in periodontal disease and thus, could be considered as a biochemical marker for periodontal tissue damage and may be useful in diagnosis, prognosis, and evaluation of therapy in periodontitis patients.

Role of Beta2microglobulin (β2m) in Occurrence of Multiple Myeloma

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INTRODUCTION

Multiple myeloma or Kahler's disease is a type of blood cancer where uncontrolled cell division of plasma cell takes place, producing monoclonal antibodies in greater concentration. Patient affected from multiple myeloma also suffers from anemia and renal failure.

OBJECTIVE

To evaluate the role of Beta2microglobulin (β2m) in multiple myeloma.

It is considered as a marker in hematological malignancies and significant levels of β2m can be found in lymphoproliferative disorders. As a part of pathophysiology, it has been also come to light that β2m also participates in occurrence of anemia in multiple myeloma.

Beta2microglobulin is a small membrane protein (11,800 Dalton) associated with the heavy chains of class I major histocompatibility complex proteins and is, therefore, present on the surface of all nucleated cells. It is the most consistent powerful prognostic marker, which as a single variable measures a combination of cell proliferation, cell mass, and renal functions.

MATERIALS AND METHODS

In the present study, we analyzed 35 patients for serum β2m and immunoglobulin levels at time of diagnosis and after treatment. The β2m was estimated using turbidimetry method on Beckman Coulter AU 2700 Chemistry analyzer and immunoglobulin levels were estimated with Nephlometry on Beckman Coulter Immage 800 immunochemistry analyzer.

CONCLUSION

We concluded that degree of elevation of β2m correlates well with elevated levels of monoclonal protein. Elevated β2m may play role in maintenance of malignant clone.

Evaluation of Serum Uric Acid Level in Young Obese Adults and its Correlation with Body Mass Index

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OBJECTIVE

Elevated uric acid level is commonly associated with conditions, such as obesity, diabetes mellitus, hypertriglyceridemia, coronary artery disease, and hypertension. Consequently, the aim of this study was to assess the uric acid levels in obese paramedical students and association of high levels of serum uric acid with obesity.

MATERIALS AND METHODS

A total of 30 obese and 30 nonobese healthy paramedical students in the age group of 18 to 26 years were taken as study subjects from MGM Medical College, Indore (Madhya Pradesh, India) in our study. Uric acid was analyzed by standard methods. Height and weight were measured, and body mass index (BMI) was calculated in all study subjects.

RESULTS

Mean serum uric acid levels of obese and nonobese were 7.06 ± 0.614 and 3.73 ± 1.12 mg/dL respectively. Serum uric acid level showed significant correlation with BMI ($p = 0.000$).

CONCLUSION

In our study, we concluded that uric acid levels were significantly increased in obese when compared to nonobese paramedical students. Since hyperuricemia is strongly associated with obesity and metabolic syndrome, routine monitoring of all obese individuals for serum uric acid is recommended.

de la Chapelle Syndrome: A Rare Case Report

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INTRODUCTION

The 46 XX male syndrome (de la Chapelle syndrome) is a rarely seen genetic disorder causing male infertility. It is generally a result of unequal crossing over between X and Y chromosomes.

CASE REPORT

A 25-year-old infertile male presented to endocrinology outpatient department. He had normal external male genital phenotype and secondary sex characters. History of bilateral mastectomy done for gynecomastia 4 years ago was present. At physical examination, soft and atrophic testes were palpated. Laboratory analysis and testis biopsies indicated nonobstructive azospermia. Chromosomal analysis showed 46 XX karyotype.

CONCLUSION

In the literature, there are various phenotypic properties of 46 XX male patients. Thus, translocation of the sex determining region may be present; the gene probably cannot be the only reason for XX male syndrome. There might be some other abnormalities leading to de la Chapelle syndrome.

Acne Pathogenesis: Review of Concepts

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INTRODUCTION

Acne outcome is definitely regarded as highly dependent on sebum reduction. Besides the hyperproduction of sebum, other functions of the sebaceous glands may be involved in the acne process: Oxidant/antioxidant ratio of the skin surface lipids,

regulation of local androgen synthesis, production of antimicrobial peptides, neuropeptides, and synthesis of specific lipids with antimicrobial activity, such as sapienic acid. Until the middle of the 20th century, it is hypothesized that seborrhea, follicular keratosis, and microorganisms could be individually responsible for the acne lesions, but inflammation was only regarded as the final and inescapable step of the acne process.

Finally, in the mid-20th century, none of the hypothesized factors could entirely explain the processes that cause the various acne lesions. Acneologists, therefore, suggested that a "chain of factors" and a "web of etiologic agencies" contribute to the formation of the lesions, namely keratinization at the opening of the follicle, bacterial invasion, sebum alteration, and inflammation. It is important to note that acne is not caused by excess in hormone levels, but an abnormal reaction to normal levels of these hormones.

Since its first clinical description, acne has always been the subject of a great number of studies and research. But only very few of them dealt with the history of the disease focusing on semantic considerations. To the best of our knowledge, the genesis and development of the 4 factors that constitute the pathogenic framework of acne have not been studied from a historical point of view. The aim of our review is, therefore, to show the areas of overlapping and the therapeutic implications of the pathogenic trends and find out the association of hormonal status including insulin hormone with the different grades of acne vulgaris.