

## **Abstract : Basic Sciences**

### **Effect of Type 2 Diabetes Mellitus on Brainstem Auditory Evoked Response**

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#### **INTRODUCTION**

Diabetes mellitus has been implicated as an independent causative factor for sensorineural hearing loss. The brainstem auditory evoked responses (BAER) represent a useful, non-invasive, and simple procedure to detect both the acoustic nerve and CNS damage. The study was conducted to compare the brainstem auditory evoked responses in patients of type 2 diabetes mellitus with matched normal subjects.

#### **METHODS**

A cross-sectional study was conducted to compare brainstem auditory evoked responses in patients of type 2 diabetes mellitus (n=50) and matched healthy controls (n=50) using consecutive sampling technique. The effect of duration of diabetes on BAER and usefulness of this screening tool were assessed.

#### **RESULTS**

All BAER waves I to V and interpeak latencies (I-III, III-V and I-V) of both ears showed a statistically significant difference ( $p < 0.05$ ) among cases and controls except for interpeak latency of III-V of left ear. Cases had prolonged interpeak latencies which is an early sign of central neuropathy and can prove to be diagnostically important. Correlation coefficient of BAER interpeak latencies of right and left ears of cases showed only partial or weak correlation which depicts that interpeak latencies are not affected much by the duration of disease.

#### **CONCLUSION**

Brainstem auditory evoked response waves can act as a screening tool for central neuropathy.

### **Role of Adipose Tissue Derived Hormones in Early Diagnosis of Type 2 Diabetes**

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#### **INTRODUCTION**

Impaired fasting glucose (prediabetes) is defined as fasting plasma glucose level ranging from 100 to 125 mg/dl. Type 2 diabetes develops as a consequence of early  $\beta$ -cell dysfunction and insulin resistance. The purpose of this study was to examine and compare the relationship of adipose tissue derived hormones with insulin resistance and  $\beta$ -cell function in prediabetes and newly diagnosed type 2 diabetics.

#### **METHODS**

In the study 75 prediabetic and 75 newly diagnosed type 2 diabetics with BMI  $< 30 \text{ kg/m}^2$  were enrolled. Biochemical analytes measured were plasma glucose (fasting), serum insulin, adiponectin, leptin, resistin, visfatin, interleukin-6, and plasma acylated ghrelin. Homeostasis model assessment for insulin resistance (HOMA-IR) and  $\beta$ -cell function (HOMA- $\beta$ ) were calculated.

#### **RESULTS**

Adiponectin, leptin, and interleukin-6 were strongly correlated to HOMA-IR (hepatic insulin resistance) in prediabetes and were associated with both HOMA-IR and HOMA- $\beta$  in newly diagnosed type 2 diabetics. Resistin and visfatin levels were increased but unrelated to obesity and insulin resistance. Acylated ghrelin was neither related to BMI nor insulin resistance.

#### **CONCLUSION**

Adiponectin, leptin, and interleukin-6 are early indicators of type 2 diabetes while resistin and visfatin are predictors of pathogenesis independent of obesity in preobese subjects.

## **Study of Serum Irisin, Homocysteine and Gamma Glutamyl Transferase in Patients of Diabetes Mellitus**

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### **INTRODUCTION**

Diabetes mellitus is a metabolic disorder characterized by increased blood glucose level resulting from defects in insulin secretion and/or insulin action. The purpose of this study was to assess risk of diabetes using biomarkers like irisin, homocysteine, and gamma glutamyl transferase.

### **METHODS**

In this case control study, age and sex matched 100 diagnosed cases of type 2 diabetes mellitus and 100 healthy controls were included. Serum levels of irisin, homocysteine, and gamma glutamyl transferase were measured and compared with healthy controls.

### **RESULTS**

The mean serum levels of irisin, homocysteine, and gamma glutamyl transferase in cases were  $202.2 \pm 21$  ng/ml,  $13.87 \pm 2.16$   $\mu$ mol/l,  $48.0 \pm 21.4$  IU/l, while in controls these were  $214.9 \pm 56.8$  ng/ml,  $9.53 \pm 5.54$   $\mu$ mol/L, and  $28.8 \pm 16.0$  IU/l respectively. These values were found to be statistically significant ( $p < 0.001$ ). Mean value of homeostasis model assessment for insulin resistance (HOMA-IR) in cases and controls was  $4.17 \pm 1.78$  and  $2.18 \pm 0.78$  respectively. Significant difference ( $p < 0.001$ ) was found for HOMA-IR. As body mass index (BMI) increases, HOMA-IR also increases.

### **CONCLUSION**

Level of irisin is decreased whereas levels of homocysteine and gamma glutamyl transferase are increased in type 2 diabetic patients.

## **Study of Combination of Pregnancy Associated Plasma Protein-A and Copeptin Assay in Early Diagnosis of Acute Myocardial Infarction**

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### **INTRODUCTION**

Acute myocardial infarction (AMI) is a potentially life-threatening manifestation of ischemic heart disease. The purpose of this study was to study the combination of pregnancy associated plasma protein-A (PAPP-A) and copeptin assay in early diagnosis of acute myocardial infarction.

### **METHODS**

This study was carried out on 100 patients of acute myocardial infarction attending cardiac emergency and 100 healthy controls. Serum levels of PAPP-A, copeptin, and troponin T were measured and compared. These were correlated with risk factors, body mass index, and time of presentation of patient to cardiac emergency.

### **RESULTS**

Serum copeptin and PAPP-A level were significantly elevated in cases of acute myocardial infarction compared to the controls ( $p < 0.001$ ). Serum copeptin levels was highest in STEMI and in those who presented early within 3 hours and lowest in unstable angina and those presented late within 12 hours.

### **CONCLUSION**

Troponin level helps in early diagnosis of acute myocardial infarction. Combining copeptin or PAPP-A to troponin T enhances the sensitivity to diagnose AMI early.