Abstract: Basic Sciences

Autonomic Functions in Young Non-diabetic Offsprings of Type 2 Diabetes Mellitus Parents

Pallavi Dubey

Department of Physiology, J L N Medical College and Associated Group of Hospitals, Ajmer.

INTRODUCTION

Children with parental history of diabetes have inherited susceptibility to develop diabetes. It has been shown that patients with diabetes mellitus exhibit altered autonomic activity of cardiovascular system. The purpose of this study was to determine the early changes in cardiac autonomic modulation in young non diabetic offsprings of type 2 diabetes mellitus parents.

METHODS

This cross-sectional study of cardiovascular autonomic functions was carried out in 50 healthy non-diabetic offsprings of type 2 diabetic parents (case group) and 50 healthy offsprings of non -diabetic parents (control group) in the age range of 18 - 25 years by assessing ratio of longest and shortest R-R interval during deep expiration and inspiration respectively (E/I ratio), rise in diastolic blood pressure (DBP) during sustained handgrip and heart rate variability (HRV) analysis. Statistical analysis was done by Chi Square test and student t-test. Probability p value <0.05 was considered statistically significant.

RESULTS

In offsprings of type 2 diabetic patients basal heart rate was higher ($p < 0.001$), the rise in diastolic blood pressure was exaggerated ($p < 0.001$) and deep breathing E/I Ratio was lower ($p < 0.001$). Among the frequency domain indices of heart rate variability (HRV), High Frequency (HF)(nu) was significantly reduced ($p < 0.02$) and Low Frequency (LF)(nu), and LF-HF ratio were significantly increased ($p < 0.02$, $p < 0.014$ respectively) in the case group as compared to the control group. All the time domain indices (RMSSD, SDNN and pNN50) were significantly less ($p < 0.023$, $p < 0.037$, $p < 0.046$ respectively) in test group as compared to that of the control group.

CONCLUSION

Autonomic dysfunctions may be associated with increased risk of future diabetes; hence early detection of autonomic impairment can be used for risk stratification to reduce serious consequences.

A Study of P-300 and Mini Mental State Examination in Mild Cognitive Impairment and Alzheimer's Dementia

Suraj Prakash Indoria, Abhishek Saini, Bhupendra Patel, Kapil Gupta, Jitendra Gupta, Amitabh Dube

Department of Physiology, S M S Medical College and Associated Group of Hospitals, Jaipur

INTRODUCTION

Alzheimer's disease (AD) is the most common cause of dementia worldwide and its prevalence increases steadily with age. The present study was undertaken to appreciate neural dynamics in Alzheimer's Disease in terms of amplitude and latency of event related potential (ERP) giving an insight into working of neuronal pools sub serving P300, an endogenous cognitive component of ERP.

METHODS

The study was conducted in Department of Physiology at S M S Medical College and Associated Group of Hospitals, Jaipur. The age range of the study population was 55 to 70 years that was categorized into three groups namely, Alzheimer's disease (AD) group, Mild Cognitive Impairment (MCI) group and Healthy Control group using Mini Mental State Examination (MMSE) score as per Diagnostic and Statistical Manual (DSM) V criteria. The study included five patients with mild to moderate AD, 30 patients with MCI, and 30 were healthy controls. ERP was recorded at Fz, Pz and Oz electrode sites using visual oddball paradigm, in which the subject was presented with a series of 100 visual stimuli.

RESULTS

The amplitude of P 300 displayed a significant difference across the three groups at Fz electrode site while the latency of P 300 was significantly decreased at Fz in AD group as compared to that observed in healthy controls.

CONCLUSION

The time locked feature of Fronto Occipital Neuronal Pool and (space) amplitude locked feature of Fronto Parietal Neuronal Pool elicit the limiting neural mechanisms underlying neurocognitive processes that are sub served by the select neuronal pools through P 300 wave form, a finding that could contribute significantly to prevention and management of Alzheimer's disease.