ABSTRACT

EVALUATION OF COGNITIVE EVOKED POTENTIAL P300 AND CORRELATION TO SERUM INSULIN LEVELS IN ALCOHOL DEPENDENCE PATIENTS

Degree for which submitted : Doctor of Medicine (MD) in Physiology.

Supervisor and guide : Prof. Dr. C. Thirupathi.

Department : Institute of Physiology and Experimental Medicine .

College : Madras Medical College, Chennai-600003.

University : The Tamil Nadu Dr. M. G. R. Medical University, Chennai-600032 .

Year : 2018

Background:

Alcohol dependence is an increasing burden to the society worldwide. Alcohol dependence causes cognitive impairment . Cognitive evoked potential P300 is impaired in alcohol dependence . Newer cognitive markers for alcohol dependence are emerging. Insulin is a cognitive marker for Alzheimer’s disease and Type 2 Diabetes mellitus. Insulin is under research as a cognitive marker for alcohol dependence. It is observed that insulin levels are higher in non diabetic alcohol dependent individuals.

Aim and objectives:

To correlate cognitive evoked potential P300 values with serum Insulin level in alcohol dependence individuals and to evaluate whether insulin can be kept as a biomarker for cognitive functioning .
Methods and Methodology:

There were sixty participants in the study. Thirty participants with alcohol dependence were taken as case group and thirty healthy volunteers were taken as control group. Cognitive evoked potential $P_{300}$ was measured in both case and control group. Fasting serum insulin and sugar levels were measured in both the case and the control group.

Results:

The $P_{300}$ latency was prolonged and amplitude was diminished in the case group compared to the control group ($p<0.0001$). The serum insulin and sugar levels were raised in the case group compared to the control group ($p<0.01$). The serum insulin values correlated significantly with $P_{300}$ latency and amplitude values.

Conclusion:

The patients with alcohol dependence had significant impairment in event related potential $P_{300}$ latency and amplitude when compared with controls. The study group had significant increase in fasting serum insulin and blood sugar levels compared to the control group. There is significant correlation between the $P_{300}$ latency and the serum insulin level and also the $P_{300}$ amplitude and the serum insulin level in the study group. Hence it can be derived that there is cognitive impairment in alcohol dependence and that serum insulin can be used as a cognitive marker in alcohol dependence patients.

Key words:

Alcohol dependence, Cognitive evoked potential, $P_{300}$ latency, $P_{300}$ Amplitude, Serum insulin levels, Blood sugar levels.