VISUAL REACTION TIME IN HEALTHY CONTROLS, TYPE II DIABETES MELLITUS (DM) - A CASE CONTROL STUDY

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INTRODUCTION
As estimated in 2014, around 387 million people have DM world wide.[1,2] Among many complication of DM, damage to the eyes due to neuropathy results in gradual vision loss and blindness. The nerve conduction study has lot of confounding factors like age, sex, height.[3,4] Sensory motor association test like visual reaction time found in milliseconds is a very easy and a comfortable non invasible tests done to evaluate neuropathy even before serious complication of DM occur. There are studies to show that the duration and degree of glycaemic control has an effect on the severity of neuropathy.

OBJECTIVES
1. To perform visual reaction time in healthy controls and type II DM.
2. To compare the visual reaction time among healthy controls and Type II DM.

METHODOLOGY
Around 80 age and sex matched volunteers were recruited for the study. After obtaining written informed consent and Institutional ethical clearance, the questionnaire related to the Diabetic history were obtained. They were grouped into 30 healthy controls, and 50 with Diabetes Mellitus. Visual reaction time were performed for all the volunteers. The results were statically analysed by ANOVA and correlation of the visual reaction time among the controls and Type II DM were analysed.

VISUAL REACTION TIME
PC 1000 Hertz Reaction Timer were used to measure auditory and visual reaction time. Reaction time is recorded in audacity software. The procedure has to be repeated 5 times. The least of the value is taken as the final value of the subjects visual reaction time.[5]

IMPLICATION: Diabetic neuropathy can be diagnosed as early as possible with such an simple tests even before serious complication arises. In this study we are going to correlate the duration of the DM with the visual reaction time. This tests can determine how early eye is affected in DM, so that other complication can be attended earlier with proper management. Visual reaction time is also compared with the glycaemic control, which may be useful tool to evaluate complication.
RESULTS

Graph 1.

Graph 2.

Graph 3.
Hypothesis Test Summary

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>The distribution of AVERAGE VALUE OF VRT IN ms is the same</td>
<td>Independent-Samples Mann-</td>
<td>.033</td>
<td>Reject the null</td>
</tr>
<tr>
<td>across categories of WHETHER DM.</td>
<td>Whitney U Test</td>
<td></td>
<td>hypothesis.</td>
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Asymptotic significances are displayed. The significance level is .05.
DISCUSSION
We can learn from graph 2 that VRT is reduced in Diabetes Mellitus patients. It is also evident from graph 3, 4 and 5 that VRT is deviated grossly away from the expected value whereas the VRT is nearly falling on the same line as that of the expected value. Therefore the study shows that the study is statistically significant with a P value of 0.033 as evident from the table, which shows VRT can be used as a tool to diagnose diabetic complication related to vision with this simple test. M. Muhil et al.\(^6\) states that there is delayed visual reaction time in diabetes mellitus which is consistent with our study.

CONCLUSION: Diabetic neuropathy can be diagnosed as early as possible even before complication arises. This test is useful to evaluate diabetic complications.

REFERENCE