



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

Dr. Renuka Devi. M.R, Dr. S. Mahila*, Dr. P. R. Devaki, Dr. P. Sai Kumar and A. Hari Chakiravarthy

Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research.

***Corresponding Author: Dr. S. Mahila**

Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research.

Article Received on 21/11/2018

Article Revised on 11/12/2018

Article Accepted on 01/01/2019

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 a 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-invasive test done to evaluate neuropathy even before serious complication of DM occurs. 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.

compared with the glycaemic control, which may be a useful tool to evaluate complication.

METHODOLOGY

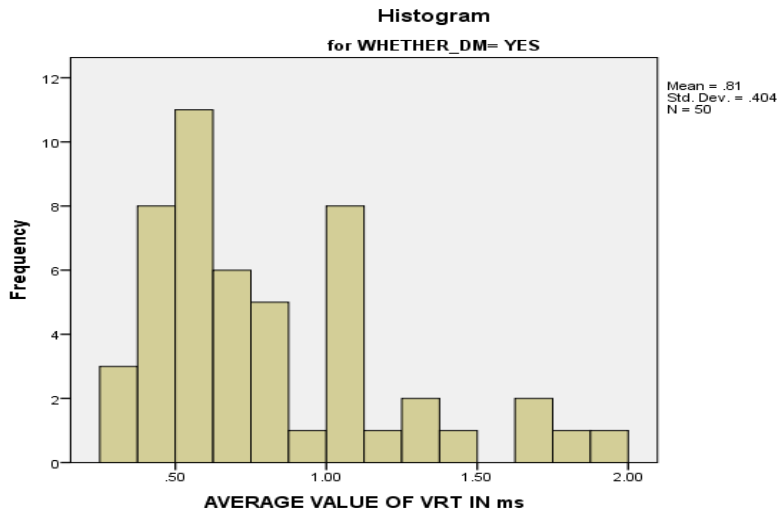
Around 80 age and sex matched volunteers were recruited for the study. After obtaining written informed consent and Institutional ethical clearance, the questionnaire related to the Diabetic history was obtained. They were grouped into 30 healthy controls, and 50 with Diabetes Mellitus. Visual reaction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

VISUAL REACTION TIME

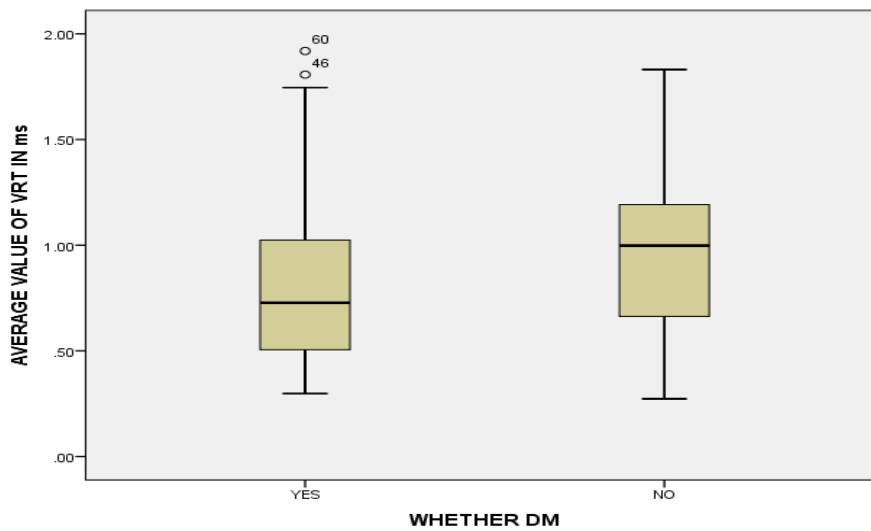
PC 1000 Hertz Reaction Timer was used to measure auditory and visual reaction time. Reaction time is recorded in Audacity software. The procedure has to be repeated 5 times. The least of the value is taken as the final value of the subjects' visual reaction time.^[5]

IMPLICATION: Diabetic neuropathy can be diagnosed as early as possible with such simple tests even before serious complications arise. In this study, we are going to correlate the duration of DM with the visual reaction time. These tests can determine how early the eye is affected in DM, so that other complications can be attended earlier with proper management. Visual reaction time is also

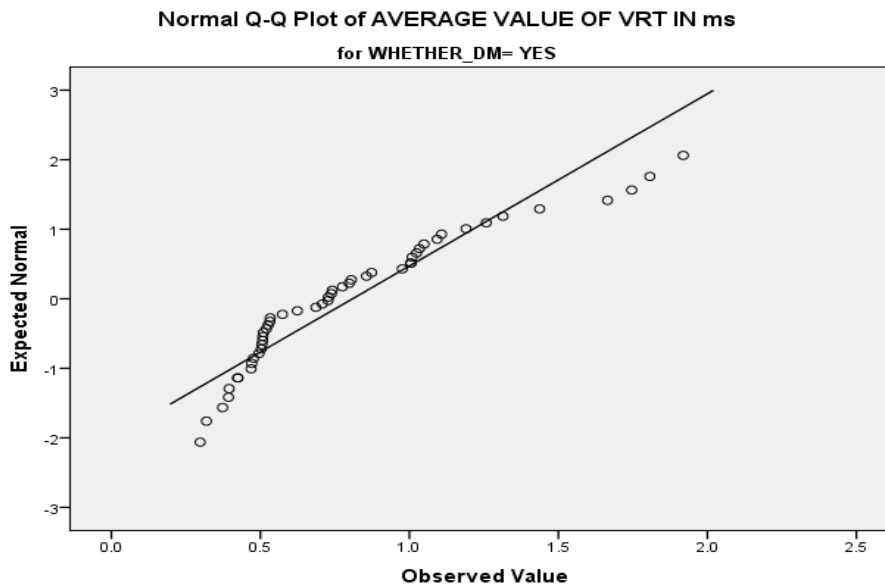
RESULTS



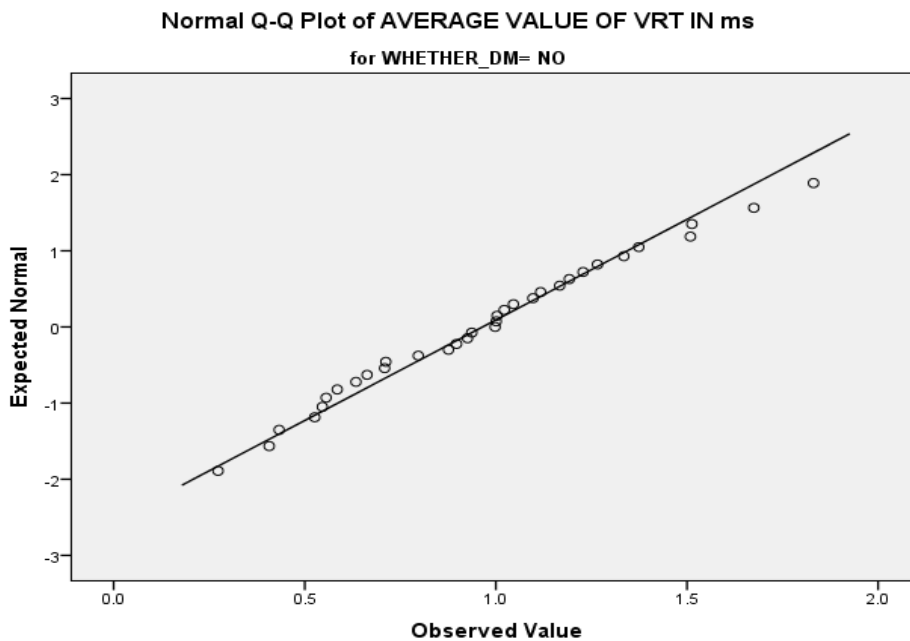
Graph 1.



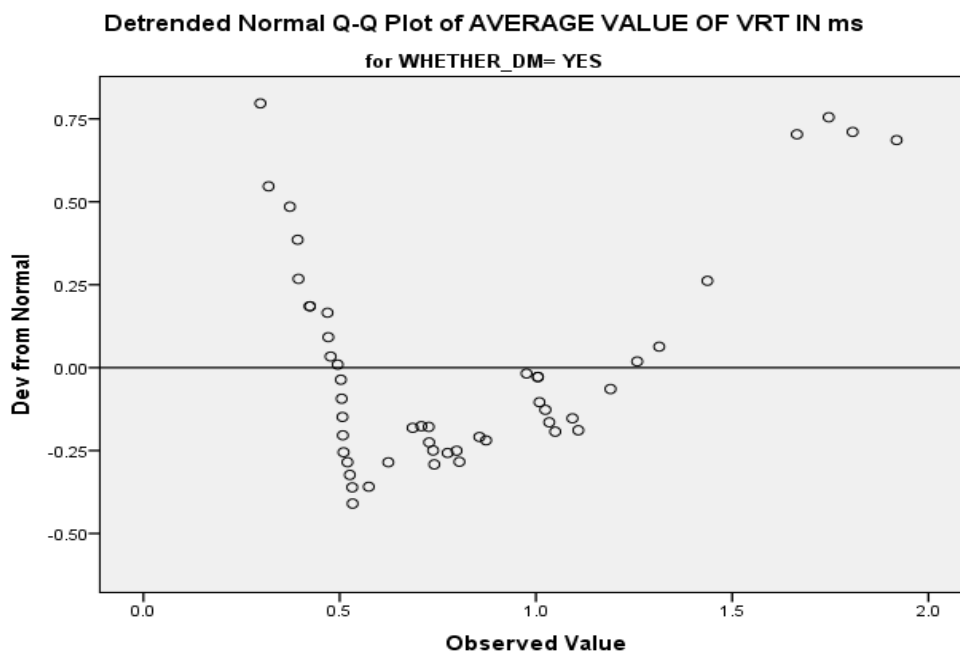
Graph 2.



Graph 3.



Graph 4.



Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of AVERAGE VALUE OF VRT IN ms is the same across categories of WHETHER DM.	Independent-Samples Mann-Whitney U Test	.033	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

WHETHER DM		N	Mean	Std. Deviation	Std. Error Mean
AVERAGE VALUE OF VRT IN ms	DM CASES	50	.8091	.40391	.05712
	NO DM CASES	33	.9652	.37862	.06591

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
AVERAGE VALUE OF VRT IN ms	Equal variances assumed	.128	.722	-1.766	81	.081	-.15610	.08839	-.33198	-.01977	
	Equal variances not assumed			-1.79071	71.706	.078	-.15610	.08722	-.32998	-.01778	

Graph 5.

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

1. update 2014, IDF, International Diabetic federation, retrieved 29 NOV 2014.
2. Diabetes Programme, WHO, retrieved April 2014.
3. Albers JW, Brown MB, Sima AA, Greene DA: Nerve conduction measures in mild diabetic neuropathy in the Early Diabetes Intervention Trial: the effects of age, sex, type of diabetes,disease duration, and anthropometric factors. Tolrestat

Study Group for the Early Diabetes Intervention Trial. *Neurology*, 1996; 46: 85-91.

4. Anonymous: Effect of intensive diabetes treatment on nerve conduction in the Diabetes Control and Complications Trial. *Ann Neurol*, 1995; 38: 869-880.
5. Dr. R.Niruba, Dr.K.N.Maruthy, Auditory and visual reaction time in Type II DM Al Ameen *J Med Sci*, 2011; 4(3): 274-279.
6. M, Muhil et al. "Study of Auditory, Visual Reaction Time and Glycemic Control (HBA1C) in Chronic Type II Diabetes Mellitus." *Journal of Clinical and Diagnostic Research: JCDR* 8.9 (2014): BC11-BC13. *PMC*. Web. 10 Mar. 2018.