International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR |Volume 7 | Issue 4 | Oct - Dec - 2019
www.ijamscr.com

Research article *Medical research*

A study to identify autonomic dysfunction using sympathetic skin response in type 2 diabetes mellitus patients in a tertiary care hospital

Roshinidevi Baskaran, Dr. Thaseen A

III MBBS, Saveetha Medical College
Assistant professor, Neurology Department, Saveetha Medical College
***Corresponding Author**: **Thaseen A**

ABSTRACT

Autonomic dysfunction has been identified and recognized as a complication of Type 2 Diabetes Mellitus. But the use of sympathetic skin response as a valid measure of autonomic dysfunction has been questionable. This study uses sympathetic skin response to identify autonomic dysfunction in patients with type 2 diabetes mellitus.

Aim

To assess the incidence of autonomic dysfunction in patients with type 2 diabetes mellitus using sympathetic skin response test and H-R variability.

Methodology

This is a prospective study conducted on 30 patients diagnosed with Type 2 Diabetes Mellitus.
Sympathetic skin response of the upper and lower limbs and Heart rate variability (by R-R interval) was studied and the observations recorded. The results of the above studies have been recorded and analysed.

Result

Decreased sympathetic skin response (amplitude and latency) in the lower limb was observed in 50% of the type 2 diabetic patients and Decreased sympathetic skin response (amplitude and latency) in the upper limb was observed in 26.6% of the type 2 diabetic patients. R-R interval was within the normal range (0.6-1.2) in all the patients.

Conclusion

Decreased sympathetic skin response is common in type 2 diabetes mellitus patients which can be used to identify autonomic dysfunction in these patients. The lower limbs are more affected compared to the upper limbs.

INTRODUCTION

Autonomic neuropathy is a complication of diabetes mellitus, which comprises of bladder function abnormalities, foot ulcers, abnormal sweating and neuropathic pain.

The prevalence of autonomic neuropathy among diabetics depends on the population studied, ranging from a third of randomly selected patients to as much as two-thirds in those with peripheral neuropathy. Early symptoms of autonomic dysfunction may be extremely subtle and non-specific and hence end up not being recognized. Autonomic function can be assessed to assist in the care of diabetic patients and symptomatic management. Procedures like nerve biopsy help in producing reliable and confirmatory evidence of autonomic dysfunction, non-invasive tests may be

of more use and more convenient for everyday clinical use.

Sympathetic skin response is a non invasive test with the potential to be used as a routine clinical test to identify autonomic neuropathy. It is a transient change in the electrical potential of the skin evoked by a variety of stimuli, the response of which consists of a multi synaptic reflex arc.

The aim of the present study is to examine the utility of the Sympathetic Skin Response as a measure of autonomic function in patients with Type 2 Diabetes Mellitus.

Diabetic cardiovascular autonomic neuropathy (DCAN) is one of the most common complications in patients suffering from DM, which causes abnormalities in the heart rate (HR) control as well as the central and peripheral vascular dynamics with serious consequences like myocardial infarction. At present, there is no cure for either DCAN and the nerve damage is usually irreversible. Early and timely detection can give the patient a better chance to combat it. Heart rate variability test is a non invasive simple procedure to identify any abnormalities that can signify DCAN and hence measures can be taken to curb the progression at the earliest.

Hence this study focuses on using sympathetic skin response and heart rate variability to assess autonomic dysfunction in patients with type 2 Diabetes Mellitus.

Aim

To assess the incidence of autonomic dysfunction in patients with type 2 diabetes mellitus using sympathetic skin response test and H-R variability.

Objectives

- To assess the incidence of symptomatic and asymptomatic autonomic dysfunction in Type 2 Diabetic patients.
- To assess and compare the sympathetic skin response of upper and lower limbs in patients with Type 2 diabetes mellitus.

METHODOLOGY

This was a hospital based prospective study conducted in Saveetha Medical College and Hospital, Thandalam.

The study comprises of 30 Type 2 diabetic patients out of which 15 have symptoms of autonomic dysfunction and 15 do not have any symptoms of autonomic dysfunction.

Sympathetic skin response tests on the upper and lower limbs and R-R interval measurement to assess heart rate variability was performed on all the 30 patients with their consent in the neurology department by trained lab technicians.

The results of the tests were tabulated and comparisons on the degree of involvement of the limbs, incidence in different age groups and sex groups were made.

Chi square test was used to determine the association between variables. The differences were considered to be significant if the p value was less than 0.05.

RESULTS

30 type 2 diabetes patients were enrolled and heart rate variability and sympathetic skin response was examined. There were 17 females and 13 males. The age range was from 20 – 70 years.

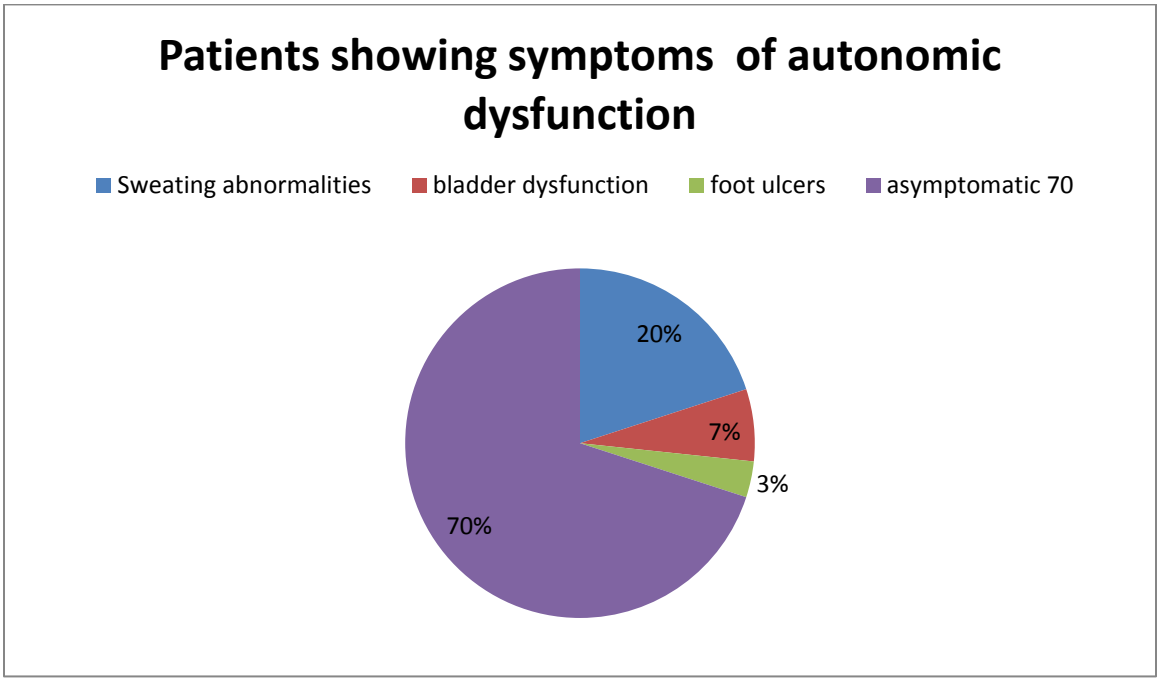
Decreased sympathetic skin response in the upper limb was observed in 76.92 % of the males in this study and in 41.17% of the females in the study.

Decreased sympathetic response in the lower limb was observed in 92.30% of the males in this study and in 64.70 % of females in the study.

REDUCED SYMPATHETIC SKIN RESPONSE	UPPER LIMB	LOWER LIMB
MALES	10	12
FEMALES	7	11
TOTAL	17	23

Therefore the upper limb was affected in 56.66% of the subjects and the lower limb was affected in 76.66% of the subjects.

Symptoms of autonomic dysfunction were observed only in 30% of the diabetic subjects.



Chi square tables showed no association between the age and sex of the disease.

DISCUSSION

Autonomic neuropathy is a recognized complication of diabetes mellitus. A strong association has been observed between autonomic neuropathy and cardiovascular risk. Hence autonomic dysfunction has to be identified in early stages of diabetes by using non invasive tests like sympathetic skin response tests.

Abnormal sympathetic skin response has been observed in 47.36% of the diabetic patients who were asymptomatic and in 100% of the symptomatic patients in either limb.

Abnormal sympathetic skin response was observed more in the lower limb (76.66%) than in the upper limb (56.66%) signifying that lower limbs are more affected in autonomic dysfunction.

There is significant difference between Upper and lower limb with respect to latency and amplitude in the sympathetic skin response test.

REFERENCES

[1]. Ziegler D.Diabetic cardiovascular autonomic neuropathy: clinical manifestation and measurement. Diabetes Rev 7, 1999, 342-54

[2]. Kennedy JM, Zochodnr DW. Experimental diabetic neuropathy with spontaneous recovery: is there irreparable damage? diabetes 54, 2005, 830-7

[3]. Sucharita S,bantwal G,Idiculla J,Ayyar V, Vaz M,autonomic nervers system function in type 2 dilabetes using convintional clinical autonomic test,heart rate and blood pressure variability measures. Indian J Endocrinol Metab 15, 2011, 198-203a

[4]. Zigler D, Laux G, Dannehl k,Spuler M, Muhlen H,Mayer P,et al. Assessment of cardiovascular autonomic function: age- related normal ranges and reproducibility of spectral analysis, vector sanalysis and standard test for heart rate varation and blood pressure responses Diabet Med 9, 1992, 166-75.

How to cite this article: Roshinidevi Baskaran, Dr. Thaseen A. A study to identify autonomic dysfunction using sympathetic skin response in type 2 diabetes mellitus patients in a tertiary care hospital. Int J of Allied Med Sci and Clin Res 2019; 7(4): 1288-1290.
Source of Support: Nil. **Conflict of Interest:** None declared.