ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
Index Copernicus Value: 68 . 16
PubMed - National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 5, Issue –4, August - 2020, Page No. : 178 - 181

A comparative study on cardiovascular parameters in Normal & Type 2 Diabetes mellitus patients

[1]Dr. Hitendra Gupta, Assistant professor, Physiology, North Delhi Municipal Corporation Medical College And Hindu Rao Hospital, Delhi

[2]Dr. Anita Motiani, Senior resident Biochemistry, North Delhi Municipal Corporation Medical College And Hindu Rao Hospital, Delhi

Corresponding Author: Dr. Anita Motiani, Senior resident Biochemistry, North Delhi Municipal Corporation Medical College And Hindu Rao Hospital, Delhi

Citation this Article: Dr. Hitendra Gupta, Dr. Anita Motiani, "A comparative study on cardiovascular parameters in Normal & Type 2 Diabetes mellitus patients", IJMSIR- August - 2020, Vol – 5, Issue - 4, P. No. 178 – 181.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Current interest centers on the development of a new generation of tests of autonomic nerve function that are simple, non- invasive, reproducible and allow precision in diagnosis and accurate quantization. Most of them are based on cardiovascular reflexes and abnormality in them is assumed to reflect autonomic damage elsewhere.

Methods: The study was carried out in 50 Type-2 diabetic patients with duration of diabetes ranging from 6 months to 20 years. Control Group consists of 50 normal individuals who matched with case in age, sex and socio economic condition as far as possible.

Results: Mean arterial pressure of Diabetic patients was found to be 94.23±7.13 mmHg which again is more than mean arterial pressure of normal persons which is 92.31±7.32 mmHg. Though there is a difference in mean arterial pressure among two groups, but it was statistically Insignificant (p>0.05)

Conclusion: In diabetic patients, there is increased need for regular health checkups especially of the cardiovascular system to prevent complications and to effectively control the blood sugar levels.

Keywords: Diabetes mellitus, Cardiovascular changes, Heart rate, Mean arterial pressure.

Introduction

Diabetes prevalence is increasing globally day by day. It is a major cause of disability and death, usually, people who suffer from diabetes are unaware of the disease until they experience the side effect of this disease. Diabetic neuropathies are a long-term complication of diabetes which affect up to 50% of the patients[1]

Diabetes care involves a change in lifestyle (healthy eating, physical activity, stopping smoking, weight control), selfmanagement of the disease (adherence to the medication, self-monitoring of blood glucose) and the prevention of complications (adherence to foot care and screening for vision and kidney problems).[2-3] These complications can be divided into macro vascular and micro vascular. With the increased duration of diabetes mellitus, the risk for complications also increases substantially.

Measurement of Heart Rate Variability (HRV) is the best non- invasive method to measure the working of the heart, as it measures many aspects of cardiac functioning, including autonomic nerve functioning. The new method can replace the traditional manual method for evaluating cardiovascular responses with the advantages of speed and objectivity. Analysis of 5 minutes measurements of heart rate variability (HRV) has been shown to be a good predictor of physiological distress and mortality, especially for cardiovascular disease.[4]

Silent myocardial infarct is more common in diabetics due to involvement of cardiac autonomic nerves. At an early stage autonomic dysfunction may be asymptomatic or mildly symptomatic. [5] Symptomatic autonomic neuropathy carries worst prognosis, so early diagnosis is essential for maximum benefit more so in diabetes. Heart rate variability monitoring plays a vital role in prevention and early diagnosis of cardiac autonomic neuropathic complications.[6]

Materials and Methods

Type of study- This study was case-control type of study where individuals suffering from diabetes mellitus were considered as cases and normal healthy individuals were considered as controls

The present study was conducted in two groups classified as

Group (1) 50 normal individuals

Group (2) 50 Diabetics Type-2

Inclusion criteria

1. Only normal healthy subjects, without any family history of diabetes mellitus, known chronic disease and not using any medicine for any reason, were included in the study as control group.

2. Established diabetic patients of both type I and type II were included in case group.

3. Confirmed diabetic patients whose blood sugar level was controlled on taking oral hypoglycaemics were also included in the case group.

Exclusion Criteria

1. History of Hypertension (sitting blood pressure > 140/90 mmHg).

2. History of alcohol / smoking.

3. History of intercurrent illness (e.g.- Pyrexia, Diarrhea).

4. History of drug intake.

5. Ages below 17 years and above 70 years.

Data analysis- Student's T-test and Chi-square test were applied. Results were presented as mean ± SD or no. of patients (percent); P value <0.05 defined statistical significant difference.

Results

A total sample size of 200 with 100 normal individuals and 100 diabetic patients were included in the study.

Table 1: Socio-demographic variable

Socio-demographic variable	Group-I	Group-II	p-value
Age (Yrs)	51.23 ± 8.2	53.23 ± 8.1	>0.05
Male : Female	32 : 18	33 : 17	>0.05

Mean age of the group-I was 51.23 ± 8.2 years and group-II was 53.23 ± 8.1 years. Majority were males in both group as compared to females.

Table 2: Comparison of heart rate of normal persons and diabetic patients

Heart rate	Group-I	Group-II
Mean	82.34	84.23
SD	10.23	11.05
p-value	>0.05	

The mean value of heart rate in 50 Diabetic patients was found to be 84.23 ±11.05 per minute which higher when compared with the mean value of heart rate in 50

normal people which is 82.34 ±10.23 per minute. But this difference was statistically Insignificant (p>0.05)

Table 3: Comparison of Mean arterial pressure of normal persons and diabetic patients

Mean arterial pressure	Group-I	Group-II
Mean	92.31	94.23
SD	7.32	7.13
p-value	>0.05	

Mean arterial pressure of Diabetic patients was found to be 94.23±7.13 mmHg which again is more than mean arterial pressure of normal persons which is 92.31±7.32 mmHg. Though there is a difference in mean arterial pressure among two groups, but it was statistically Insignificant (p>0.05)

Discussion

Mean age of the group-I was 51.23 ± 8.2 years and group-II was 53.23 ± 8.1 years. Majority were males in both group as compared to females.

Similar results were found in previous studies of Ewing DJ, Martyn CN (1985)[7], Ziegler D, Zentel C in(2006) [8] where it was proved that heart rate of Diabetic are more when compared to normal due to vagal damage or due to decrease vagal tone.

Mean arterial pressure of Diabetic patients was found to be 94.23±7.13 mmHg which again is more than mean arterial pressure of normal persons which is 92.31±7.32 mmHg. Though there is a difference in mean arterial pressure among two groups, but it was statistically Insignificant (p>0.05)

According to previous studies of Grossmann et al(1996)[9]in Ann Intern Med (1996) patient with Diabetes and hypertension have a higher incidence of coronary artery disease than do patient with Diabetes or Hypertension alone. In Isfahan Diabetes prevention study[10] there is increase in systolic & diastolic pressure and also increase in mean arterial pressure in Diabetics and they are also at high risk.

Conclusion

In diabetic patients, there is increased need for regular health checkups especially of the cardiovascular system to prevent complications and to effectively control the blood sugar levels.

References

1. International Diabetes Federation (IDF) SEA Region web link: http://www.idf.org/our-network/regionsmembers/south-east-asia/members/94-india [last accessed on July 24th 2019]
2. American Diabetes Association. Standards of Medical Care in Diabetes 2014. Diabetes Care. 2014; 37(1):1- 67.
3. McEwen LN, Ylitalo KR, Herman WH, Wrobel JS. Prevalence and risk factors for diabetes-related foot complications in Translating Research into Action for Diabetes (TRIAD). J Diabetes Complications 2013;27:588-92
4. Colhoun HM, Francis DP, Rubens MB, Underwood SR, Fuller JH:.The Association of Heart-Rate Variability With Cardiovascular Risk Factors and Coronary Artery Calcification: Diabetes Care. 2001 Jun; 24(6):1108-14.
5. Cowan MJ. Measurement of heart rate variability. Western Journal of Nursing Research 1995; 17(1):32–48. [PubMed: 7863645] discussion 101–111.
6. Davidson. Principles and practice of Medicine. 17th edn. Churchill Livingstone printers; 1996. 1022 – 1023.
7. Ewing DJ, Martyn CN (1985) The value of cardiovascular autonomic function test: 10 yrs

experiment in Diabetes. Diabetes Care Vol.8:491-498.

8. Ziegler D., Zental C. (2006). Prevalence of poly neuropathy in pre-diabetics and diabetes associated with abdominal obesity and micro angiopathy. Text Book of Diabetes 2008:31:464-469.
9. Grossman G, Schwentikowski M, Keck FS, Hoher M, Steinbach G, Osterhues H, Hombach V. Signal-averaged electrocardiogram in patients with insulin-dependent (type 1) diabetes mellitus with and without diabetic neuropathy. Diabetic Med. 2004;14:364–369.
10. Janghorbani, Amini M. Comparison of systolic and diastolic blood pressure with pulse pressure and mean arterial pressure for prediction of type 2 diabetes: the Isfahan Diabetes Prevention Study. Endokrynol Pol. 2011;62(4):324-30.