JOURNAL Of Medical Science And Clinical Research
IGM Publication　　　　　An Official Publication Of IGM Publication

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

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Abstract
Background: *Diabetes mellitus (DM) is a major public health problem world-wide. It is a significant health care challenge of the 21st century.*
Methods: *The study was carried out in 100 Type-2 diabetic patients in the age group of 35-75 years with duration of diabetes ranging from 6 months to 20 years. Control Group consists of 100 normal individuals who matched with case in age, sex and socio economic condition as far as possible.*
Results: *The mean value of heart rate in 100 Diabetic patients was found to be 84.06 with standard deviation of 11.03 which higher when compared with the mean value of heart rate in 100 normal people which is 82.64 with standard deviation of 10.23. Mean arterial pressure of Diabetic patients was found to be 96.84 mmHg with a standard deviation of 7.84 which again is more than mean arterial pressure of normal persons which is 93.98 mmHg with standard deviation of 7.09.*
Conclusion: *There is increased need for regular health checkups especially of the cardiovascular system to prevent complications.*
Keywords: *Diabetes mellitus, Cardiovascular changes, Heart rate, Mean arterial pressure.*

Introduction

Diabetes mellitus is a metabolic disorder characterized by the presence of hyperglycemia due to defective insulin secretion, defective insulin action or both. The chronic hyperglycemia of diabetes is associated with relatively specific long-term microvascular complications affecting the eyes, kidneys and nerves, as well as an increased risk for cardiovascular disease (CVD). The diagnostic criteria for diabetes are based on thresholds of glycemia that are associated with microvascular disease, especially retinopathy[1].

People living with type 2 DM are more vulnerable to various forms of both short- and long-term complications, which often lead to their premature death. This tendency of increased morbidity and mortality is seen in patients with type 2 DM because of the commonness of this type of DM, its insidious onset and late recognition, especially in resource-poor developing countries like India.[2] The risk of coronary heart disease (CHD) is 2-3 times higher in diabetics than in non diabetics. CHD is responsible for 30 to 50 percent of deaths in diabetics over the age of 40 years in industrialized countries. In fact, diabetes is listed

among the five most important determinants of the cardiovascular disease epidemic in Asia[3]

Materials and Methods

The present study was conducted in two groups classified as

Group (1)100 normal individuals

Group (2) 100 Diabetics Type-2

The study was carried out in 100 Type-2 diabetic patients in the age group of 35-75 years with duration of diabetes ranging from 6 months to 20 years. Control Group consists of 100 normal individuals who matched with case in age, sex and socio economic condition as far as possible.

Informed written consent was taken from the subjects prior to the start of the study.

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) Mean±SD	51.4 ± 7.2	50.9 ± 8.1	>0.05
Male : Female	64 : 36	62 : 38	>0.05
Hindu : Muslim	93 : 7	92 : 8	>0.05

Mean age of the group-I was 51.4±7.2 years and group-II was 50.9±8.1 years. Majority were males & Hindu in both group as compared to females & Muslim.

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

Heart rate	Group-I	Group-II
Mean	82.64	84.06
SD	10.23	11.03
p-value	>0.05	

The mean value of heart rate in 100 Diabetic patients was found to be 84.06 with standard deviation of 11.03 which higher when compared with the mean value of heart rate in 100 normal people which is 82.64 with standard deviation of

10.23. But this difference was statistically not significant (p>0.05)

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

Mean arterial pressure	Group-I	Group-II
Mean	93.98	96.84
SD	7.09	7.84
p-value	>0.05	

Mean arterial pressure of Diabetic patients was found to be 96.84 mmHg with a standard deviation of 7.84 which again is more than mean arterial pressure of normal persons which is 93.98 mmHg with standard deviation of 7.09. Though there is a difference in mean arterial pressure among two groups, but it was not statistically significant (p>0.05)

Discussion

The mean value of heart rate in 100 Diabetic patients was found to be 84.06 with standard deviation of 11.03 which higher when compared with the mean value of heart rate in 100 normal people which is 82.64 with standard deviation of 10.23. But this difference was statistically not significant (p>0.05)

Similar results were found in previous studies of Ewing DJ, Martyn CN (1985)[4], Ziegler D, Zentel C in (2006)[5] 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 96.84 mmHg with a standard deviation of 7.84 which again is more than mean arterial pressure of normal persons which is 93.98 mmHg with standard deviation of 7.09. Though there is a difference in mean arterial pressure among two groups, but it was not statistically significant (p>0.05)

According to previous studies of Grossmann et al(1996)[6] 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[7] there is increase in systolic & diastolic pressure and also

increase in mean arterial pressure in Diabetics and they are also at high risk.

Conclusion

There is increased need for regular health checkups especially of the cardiovascular system to prevent complications.

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