



PREVALENCE OF COMPLICATIONS OF DIABETES MELLITUS IN A DIABETIC POPULATION AT A TERTIARY CARE TEACHING CENTRE

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ABSTRACT

Background: Diabetes mellitus is a growing challenge in India. More than 65 million people aged above 20 years were diagnosed with diabetes, indicating a prevalence of 7.7%. Diabetes is a disease that is strongly associated with both microvascular complications, i.e. retinopathy, nephropathy, and neuropathy; and macrovascular complications, i.e. ischemic heart disease, peripheral vascular disease and cerebrovascular disease. **Objectives:** This study aims at detecting the prevalence of some complications among a diabetic population attending a medical camp at our medical institute. **Study design and setting:** The study was conducted among 100 diabetic patients attending a medical camp at our hospital. Case records were obtained and trained professionals were employed to record blood pressure, random blood sugar level and biothesiometry findings. **Results and Analysis:** The average random blood sugar level was 157.16 ± 82.593 mg/dL and about 42 patients had abnormal biothesiometry findings with 6 of them having recorded severe grade of illness. **Conclusion:** Complications of diabetes mellitus need to be prevented by adequate blood sugar control and timely medication. Additional effects due to co-existing illnesses need to be checked and treated well. Periodic health checks and laboratory assessments are an inevitable part to lessen the burden of complications.

KEYWORDS: Diabetes mellitus, Blood Sugar Level, Biothesiometry, Complications, Hypertension, Body Mass Index.

INTRODUCTION

The rising prevalence of diabetes and other non-communicable diseases is driven by a combination of factors - rapid urbanization, sedentary lifestyles, unhealthy diets, use of tobacco and increasing life expectancy. Diabetes mellitus is a growing challenge in India. The WHO has estimated that about 8.7% of the population in the age group of 20 and 70 years suffers from diabetes mellitus. In India, more than 65 million people aged above 20 years were diagnosed with diabetes in the year 2016, indicating a prevalence of 7.7%.^[1] Diabetes is a disease that is strongly associated with both microvascular complications (retinopathy, nephropathy, and neuropathy) and macrovascular complications (ischemic heart disease, peripheral vascular disease and cerebrovascular disease) resulting in organ and tissue damage, in approximately one third to half of the people with diabetes.^[2]

Diabetic retinopathy (DR) is a major complication of diabetes mellitus and remains to be one of the leading cause of visual loss in working-age populations. The diagnosis of DR is made by clinical manifestations of vascular abnormalities in the retina, classified as proliferative or non-proliferative types. The most common cause of vision loss in patients with DR is diabetic macular edema (DME). Current diabetic retinopathy screening guidelines recommend a retinal examination in type 1 diabetes 5 years after diagnosis and at least annually thereafter. Type 2 diabetes patients should be examined immediately at the time of diagnosis and at least annually thereafter. More frequent examinations are advised for patients with progressing retinopathy. The methods include dilated fundus examination or retinal photography by an ophthalmologist or trained optometrist.^[3]

Diabetic neuropathy is a group of nerve disorders that can cause numbness and pain. Sensory symptoms start in

the toes and over time affect the upper limbs in a distribution classically described as a “stocking and glove” pattern. Motor involvement is not typically seen in the early stages. Vibration perception threshold (VPT) is considered as a gold standard for diagnosis of diabetic peripheral neuropathy.^[4] The biothesiometry readings were classified as: Normal (up to 10 volt), Mild (10 to 15 volt), Moderate (16 to 25 volt) and Severe (more than 25 volt).^[5]

Diabetes mellitus has been known to be associated with poor cardiovascular prognosis. In patients of diabetes mellitus without cardiovascular complications, tachycardia, shortening of the QRS and QT intervals, increase of the dispersion of QT interval, decreased amplitudes of depolarization waves, shortened activation time of ventricular myocardium and a flattening of T waves are the changes seen on Electrocardiogram.^[6]

This study aims at finding out the prevalence of these complications of diabetes mellitus among the patients diagnosed with diabetes mellitus, attending a camp held at our institute.

METHODOLOGY

The primary aim of this study was to find out the prevalence of complications among the diagnosed diabetic population attending the medical camp held at our institute. The study commenced during the Medical Camp in the month of April 2019. An observational analytical study was conducted among 100 known diabetic patients participated in the study with duly explained study methods and informed consent. Each participant went through a detailed medical interview to obtain demographic details, medical history and anthropometric measurements. Trained health personnel assisted to record blood pressure, retinoscopy and vibration test biothesiometry. All the recordings were noted in the case record proforma and the obtained information was analyzed to obtain the results.

RESULTS

About 100 participants were assessed, out of which 49 were males and 51 were females. The average age of the study participants was 53.870 ± 12.397 years. The average Body Mass Index (BMI) of the participants was 27.141 ± 5.911 kg/m². About 38 participants belonged to the overweight category and 24 participants were obese. Further details are shown in the figure below. [Figure 1].

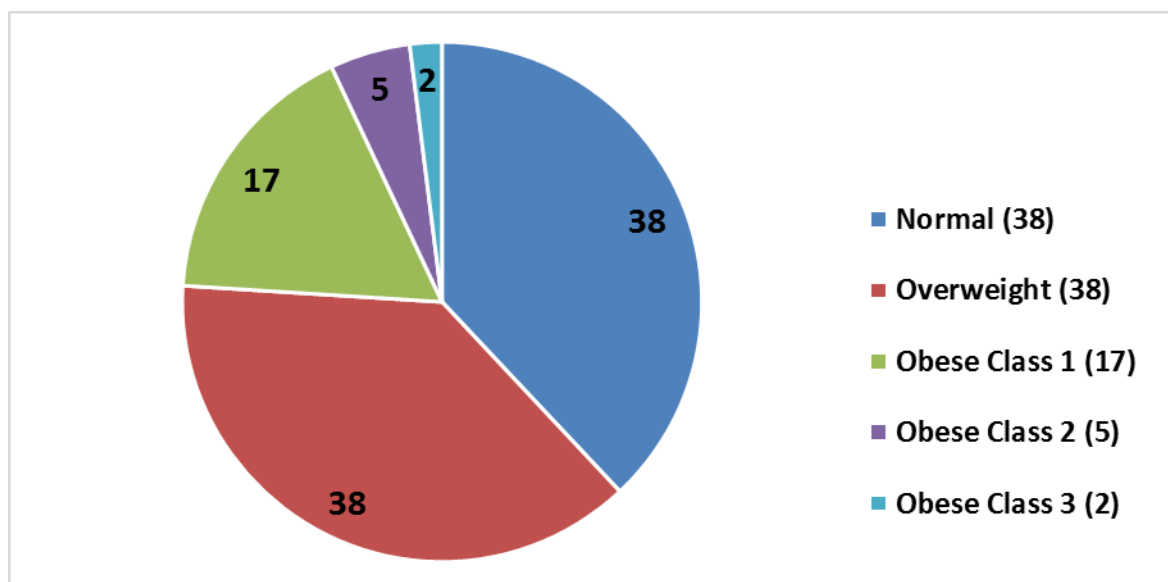


Figure 1: Participants and BMI.

Blood pressure was recorded in the left arm in supine position. About 15 participants had hypertension along with diabetes mellitus. The average systolic blood pressure was 125.82 ± 20.335 mmHg and average diastolic blood pressure was 78.64 ± 10.693 mmHg.

Random blood sugar levels (BSL) were obtained by Glucose oxidase – peroxidase method with the help of an automated analyzer in the laboratory. Values ranged between an average of 157.16 ± 82.593 mg/dL. About – participants had BSL values above 200 mg/dL stating uncontrolled diabetes mellitus.

Vibration threshold biothesiometry using specialized equipment was conducted among the participants. About 42% of the population showed abnormal results. The values obtained are shown in the table below. [Table 1].

Table 1: Biothesiometry results.

Biothesiometry	Reference values	Number of patients
Normal	Upto 10 V	58
Mild	13 – 16 V	24
Moderate	16 – 25 V	12
Severe	25V and above	6

The following table depicts the complete data of the participants of the study with respect to various study parameters. [Table 2].

Table 2: Data Analysis.

Sr. No.	Study Parameter (Units)	Average Value
1.	Age (Years)	53.87 ± 12.397 years
2.	Height (cm)	154.16 ± 10.452 cm
3.	Weight (kg)	64.23 ± 13.514 kg
4.	Body Mass Index (kg/m ²)	27.141 ± 5.911 kg/m ²
5.	Systolic BP (mmHg)	125.82 ± 20.335 mmHg
6.	Diastolic BP (mmHg)	78.64 ± 10.693 mmHg
7.	Random Blood Sugar (mg/dL)	157.16 ± 82.593 mg/dL

DISCUSSION

Through the study, we could find out the burden of complications associated with the widely prevalent disease, diabetes mellitus. It was found that increasing levels of uncontrolled blood sugar was significantly associated with increasing severity of both microvascular and macrovascular complications.^[7] It was also noted that presence of other diseases increased the pace of development of these complications. Hypertension along with the added lesions due to hyperglycemia can accelerate the progression to target-organ renal failure.^[8]

CONCLUSION

Good blood glucose control should be implemented early and maintained for the optimum length of time to avoid the development of complications. Appropriate control of blood pressure as well as dyslipidemia are extremely important in prevention of macrovascular complications, besides glycemic control. Newer drug regimens can be tried out according to patient profile and thus achieve a better reduction rate of complications. Periodic health checks and laboratory assessments are an inevitable part to lessen the burden of complications.

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