



Clinical and biochemical profile of newly diagnosed type 2 diabetes mellitus patients: A Study from Rural Tertiary Care Hospital of South Karnataka

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Abstract

Objective: To study the clinical and biochemical profile of newly detected type 2 diabetes mellitus patients from rural areas.

Method: 100 newly diagnosed type 2 diabetes mellitus patients were included in this study. Study protocol included detailed clinical history, examination and investigations. Clinical examination and investigations were done to assess hypertension, body mass index, ischemic heart diseases, lipid profile, microvascular, and macrovascular complications of diabetes mellitus.

Results: There were 56 males and 44 females. Maximum patients were belonged to fourth decade and upper-lower socioeconomic status. 18% patients had obesity and 30% people were overweight. The prevalence of abnormal Waist to hip ratio was 46 %. Polyuria was the main complaint in 60% patients. 54 % patients had hypertension. 40% patients had increased cholesterol, 52 %patients had altered triglyceride. One or more microvascular complications were detected in 67% patients. The prevalence of neuropathy, retinopathy and nephropathy was 25%, 20% and 22 % respectively.

Conclusion: This study showed more patients belonged to younger age group. Most of the patients were not obese but had abnormal waist to hip ratio. Hypertension was the commonest observed comorbidity. Significant proportions of our patients had microvascular complications at the time of diagnosis. Neuropathy was the commonest complication.

Keywords: Body mass index, Ischemic heart disease, Nephropathy, Neuropathy, Retinopathy, Type 2 diabetes mellitus.

Introduction

Type 2 diabetes mellitus (DM) is a common non communicable disease in India. In recent years, the prevalence of diabetes in urban and rural areas has significantly increased in India¹. A recent

study showed prevalence as high as 13% across rural and urban areas. Many studies proved Asian phenotype in DM. The Indian DM patient is characterized by younger age of onset, lower body mass index, higher abdominal adiposity, and

higher cardiovascular disease risk². These factors influence the choice of treatments that are available and selected in these patients³. Although DM is very common in south India, studies on clinical profile of newly diagnosed DM from rural south Indian areas are lacking. Therefore, the aim of this study was to explore this problem in our own setup.

Materials and Methods

Consecutive 100 newly diagnosed DM patients admitted in the medicine department of territory care hospital were considered for this descriptive observational study. Ethics committee approval was taken for the study. The written and informed consent of the patients was obtained.

Following patients were excluded from study

- Diagnosed case of diabetes patients on treatment.
- Seriously ill patients.
- Patients who refused to be a part of the study.
- Pregnancy.
- Patients on any drug therapy.

Study protocol included detailed clinical history and examination and investigations. A detailed clinical work up incorporating details of age, presenting complaints, diet, smoking, alcohol consumption, physical activity, reproductive history, socioeconomic status, body mass index and pedigree chart was made. DM was defined according to American, International and European Diabetes Association as – fasting blood sugar (FBS) > 126 mg/dl (fasting for at least 8 h) or 2 h postprandial sugar > 200 mg/dl (capillary and venous) or HbA1c > 6.5% or symptoms of diabetes + random blood sugar > 200 mg/dl¹. Height, waist and hip circumference were measured in centimetres by using a non-stretchable standard tape with a metal buckle at one end over the light clothing. Waist circumference was measured in the centre of the iliac crest and the costal margin, and hip circumference was measured at the widest point on buttocks below the iliac crest. Weight was

measured by using a digital scale. Patients were divided into non-obese and obese on the basis of body mass index (BMI)(weight in kg/height in m²). BMI cut off value of 25 kg/m² for male and 23 kg/m² for female was used for making diagnosis of obesity as recommended for Asian phenotype⁴. Menopause was considered to be present when there was no history of menstrual periods for the last one year. Current smokers were defined as those who smoked any form of tobacco in the previous 6 months while former smoker were those who had quit more than 6 months earlier. Subjects were asked about duration of tobacco intake and amounts consumed and were divided into two groups, tobacco chewer and non-tobacco chewer. Socio- economic statuses of the patients were divided according to kuppuswamy classification⁵. Physical activity of patient was measured as heavy, medium and light/sedentary according to modified Minnesota leisure time questionnaire⁶. Systolic blood pressure (BP) and diastolic BP were measured twice at an interval of 3 min in sitting position after a rest of 15 min. Those with blood pressure > 140 / 90 mmHg taken twice were defined as hypertensive. A diagnosis of dyslipidemia was made if total Cholesterol is > 200 mg/dl, Triglycerides > 150 mg/dl, and LDL > 130 mg/dl⁴. Diagnosis of neuropathy was made on the basis of clinical examination for sense of touch, pain and vibration and reflexes. 128 Hz tuning fork was used to examine vibration sense and 10 g monofilament was used to evaluate light touch perception. Fundus examination was done by Ophthalmologist for retinopathy. 24 hour urinary albumin estimation was done to diagnose diabetic nephropathy. A value of >300 mg/dl was taken as confirmed nephropathy. Coronary artery disease (CAD) was diagnosed on the basis of electrocardiograph (ECG) changes and treadmill test. The diagnosis of stroke was based on the clinical history and examination. Peripheral arterial disease was diagnosed by history of claudication, absence of pulses or Doppler study.

Data Analysis: Data were compiled and tabulated by using standard appropriate statistical technique, which includes numbers and percentages.

Results

In our study of 100 patients maximum incidence of DM occurred in fourth decade (Table 1). In this study 56 were males and 44 were females. The maximum number of cases was seen in upper-lower socioeconomic status (SES) (30%) (Table2). Polyuria was the main complaint in 60 patients, next in frequency was polydypsia. Ployuria and polydypsia were reported by 48% (Table 3). The major risk factors in the study group were sedentary habits (48), stress (32) family history (26), and tobacco consumption (20) (Table 4). The prevalence of abnormal Waist to hip ratio (Male > 0.95, Female > 0.8) was found to be 46 % (Table 4). In our study 40 patients had increased cholesterol, 52 patients had altered triglyceride (Table 5). In present study 18 patients had obesity and 30 people were overweight (Table 6). There were 54 hypertensive patients in this study (Table 7). One or more microvascular complications were detected in 67% patients: neuropathy in 25%, nephropathy in 22 % and retinopathy in 20 % patients. 20% of patients presented with one or more macrovascular complications (Table 8).

Table 1: Age incidence

Age groups in years	Number of DM patients	Percentage
31-40	30	30%
41-50	46	46%
51-60	20	20%
61-70	4	4%

Table 2 Socioeconomic status

Socioeconomic status	Number of DM cases	Percentage
Upper	14	14%
Upper middle	10	10%
Lower middle	20	20%
Upper lower	30	30%
Lower	26	26%

Table 3 Symptomatology

Presenting Symptoms	No. Of DM cases
Polyuria	60
Polydypsia	52
Weight loss	36
Vomiting	14
Fever	10
Other	15

Table 4 DM risk factors profile

Risk factors	Number of DM patients	Percentage
Sedentary habits	48	48%
Stress	32	32%
Family history of DM	26	26%
Tobacco consumption	20	20%
Abnormal waist to hip ratio	46	46%

Table 5 Dyslipidemia in DM patients

Type of dyslipidemia	Number of DM patients	Percentage
Hypercholesterolemia (>200mg/dl)	40	40%
Hypertriglyceridemia (>150mg/dl)	52	52%
High density lipoprotein cholesterol(<35mg/dl)	28	28%
Low density lipoprotein cholesterol(>130mg/dl)	22	22%

Table 6: Distribution of patient according to BMI

BMI	Number of DM patient	Percentage
Normal	52	52%
Overweight	30	30%
Obese	18	18%

Table 7 Hypertensive status

Hypertensive status	Number of DM cases	Percentage
Hypertensive	54	54%
Non hypertensive	46	46%

Table 8 Type of Complication

Type of complication	Number of DM cases	Percentage
Neuropathy	25	25%
Retinopathy	20	20%
Nephropathy	22	22%
Coronary heart disease	10	10%
Peripheral artery disease	8	8%
stroke	2	2%

Discussion

India carries a significant share of the global diabetes burden, because of recent rapid growth in economy and urbanization. Several studies demonstrated increase prevalence of DM in urban as well as rural populations. DM and its complications management causes huge burden on health care sector. Healthy life style modification is corner stone in primary prevention of DM³. Most of the studies conducted on DM are based on western population and we cannot implement the same guidelines on Indian counterparts.^{2,3,4} Only few studies were available on DM in rural patients from our country^{7,8}. This study was conducted to identify clinical and biochemical profile of newly diagnosed DM patients from rural areas, in order to diagnose DM early and suggest life style modification to decrease the progression of DM. In this study maximum incidence of DM occurred in fourth decade. This finding is in accordance with other Indian studies,^{7,8,9} however, less than that reported by others.^{10,11}

In this study maximum number of patients belonged to low socio economic status. The similar results were found in Mudhaliar MR et al study.¹² This association may be due to more number of poor people in the area where our study was conducted. Polyuria was the main presenting complaint in this study. Similar predominance of a classic symptom in newly diagnosed diabetics has been reported in previous study.¹³ The prevalence of abnormal Waist to hip ratio was found to be 46% in this study. Purohit A study showed similar finding.¹⁴ 52% patients BMI was normal in this study, similar finding observed in Shukla V et al study.⁷ In this study 40% patients had increased cholesterol, 52% patients had altered triglyceride. Previous studies showed similar findings.^{7,8} 54 % of our patients were found to be hypertensive. Similar results were observed in previous studies.^{7,8} The most common microvascular complication was neuropathy. It was observed in 25 % patients. Shukla V et al study showed 23% neuropathy.⁷ Bansal D et al study found neuropathy in 29.2% of patients.¹⁵

20% of patients in this study had retinopathy. Shukla V et al study found retinopathy in 16% patients.⁷ Manoj Kumar et al study showed 15.36% retinopathy.¹⁶ 22% of patients in this had nephropathy. 16% of patients had nephropathy in Shukla V et al study.⁷ Manoj Kumar in his study found nephropathy in 5.56% patients.¹⁶

Conclusion

Our study showed more patients belonged to younger age group. Most of the patients were not obese but had abnormal waist to hip ratio. Hypertension was the commonest observed comorbidity. Significant proportions of our patients had microvascular complications at the time of diagnosis. Neuropathy was the commonest complication. The main limitation of our study is small sample size. More population based studies with large sample size needed in future; various geographical areas and populations should be considered.

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