

Profile of Newly Diagnosed Type 2 Diabetes Mellitus Patients: Data from a Rural Teaching Hospital

*Dr. Amol Hartalkar¹, Dr. Sheetal Hartalkar², Dr. Alex Mathew³, Dr. Pratik Shete⁴,
Dr. Krithika Peshwe⁵, Dr. Khushal Choudhary⁶

Associate Professor, Department of Medicine, Rural Medical College, Pravara Institute of Medical Sciences (DU), P.O. Loni (Bk), Maharashtra, India¹

Consultant Periodontologist, Rural Dental College, Pravara Institute of Medical Sciences (DU), P.O. Loni (Bk), Maharashtra, India²

P.G. Student, Department of Medicine, Rural Medical College, Pravara Institute of Medical Sciences (DU), P.O. Loni (Bk), Maharashtra, India^{3,4}

Intern, Department of Medicine, Rural Medical College, Pravara Institute of Medical Sciences (DU), P.O. Loni (Bk), Maharashtra, India^{5,6}

ABSTRACT: Objective: To study the clinical & biochemical profile of newly diagnosed type 2 diabetes mellitus patients who belong to rural areas. Methodology: The study was conducted on 105 newly diagnosed type 2 diabetes mellitus patients. A detailed history & thorough clinical examination was done. Anthropometric measurements were recorded. Investigations were done to assess microvascular, macrovascular complications & lipid profile. Results: There were 54 males & 51 females. The mean age of patients was 49 years. The mean Body Mass Index of males was 23.3 kg/m² while that of females was 25.9 kg/m². Waist-Hip ratio was 0.97 in males & 0.92 in females. 30% patients had hypertension. 30% patients had a serum triglyceride level more than 150 mg%, 20% patients had total serum cholesterol more than 200 mg%, & 10% patients had LDL cholesterol than 130 mg%. The prevalence of neuropathy, retinopathy & nephropathy was 23%, 15% and 19% respectively. Conclusion: The present study shows that newly diagnosed type 2 diabetic rural males have a near normal body mass index even by the Indian criteria. The waist circumference of males was also within normal limits for Indians. Prevalence of metabolic syndrome was also very low in newly diagnosed male patients.

KEYWORDS: newly diagnosed type 2 diabetes mellitus, complications.

I. INTRODUCTION

Diabetes Mellitus is a major public health problem in India. The prevalence of Type 2 Diabetes Mellitus (T2DM) is 11% in urban areas while it is 3-9% in rural areas.¹ There are studies which have found a prevalence as high as 13.2% in rural areas.² The prevalence of T2DM is increasing worldwide. The increase is present both in urban and rural areas. Most of the studies on diabetes done in India are in urban patients. We, therefore, decided to conduct this study to profile the newly diagnosed T2DM patients who came from rural areas.

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II. MATERIAL AND METHODS

This retrospective descriptive study was conducted in the Department of Medicine at a rural teaching hospital. 105 newly diagnosed patients coming from rural areas were included in the study. They had a diagnosis of T2DM within 3 months of presentation. All patients were subjected to detailed history and thorough clinical examination. Routine relevant investigations (blood sugar, Lipid profile, renal function test) and investigations for evaluation of complications were performed. 24-hour albumin estimation was done for assessment of nephropathy. The evaluation of neuropathy was done on the basis of symptoms and other modalities including assessment of ankle reflexes, vibration perception using 128 Hz tuning fork and the use of 10 gm monofilament. Fundus examination was done for retinopathy. ECG was recorded in all patients and coronary artery disease was diagnosed on the basis of clinical features and ECG changes.

Anthropometric measurements were taken. Weight was recorded to the nearest kgs. Height was measured in cms. Body Mass Index (BMI) was calculated by the formula $\text{weight in kgs}/(\text{height in meter})^2$.

Waist circumference was measured at the midpoint between the lower border of the rib cage and the highest point of the iliac crest. Hip circumference was taken as the largest diameter around buttocks.

STATISTICAL ANALYSIS:

Data was cleaned, coded and analysed using Microsoft excel for Windows version 7. Descriptive statistics using frequency distribution was performed. All data were expressed as mean, standard deviation (SD), range, and percentage.

ETHICAL ISSUE:

Prior to commencement of the study, the protocol was approved by the local institutional ethics committee.

III. RESULTS

Out of 105 patients, 54 were males and 51 were females. The mean age of patients was 49 years. The majority of patients were in the age range of 45-49 years.

The mean BMI of male patients was 23.3 kg/m^2 while that of female patients was 25.9 kg/m^2 .

The mean waist circumference for males was 86.4 cm while that of females was 83.2 cm.

The waist-hip ratio for males was 0.97 while that of females was 0.92.

Table A shows the age and anthropometric characteristics of the study population.

Table A: Age and anthropometric characteristics of the study population

	Male	Female	Total
Age	49.06 ± 10.16	47.8 ± 7.7	48.4 ± 9.07
Weight in kg	63 ± 12.5	58.4 ± 9.2	60.7 ± 11.2
Height in cm	163.8 ± 5.06	149.8 ± 7.08	156.8 ± 9.2
BMI in kg/m^2	23.35 ± 3.7	25.9 ± 4.6	24.67 ± 4.41
Waist circumference in cm	86.4 ± 11.9	83.2 ± 8.1	84.8 ± 17.7
Hip circumference in cm	88.7 ± 12.2	90 ± 8.6	89.4 ± 10.59
Waist: Hip ratio	0.97 ± 0.05	0.92 ± 0.05	0.94 ± 0.05

24 (23%) patients had evidence of neuropathy. 20 (19%) patients had evidence of nephropathy. 16 (15%) had evidence of Retinopathy. The majority of these patients had grades 1 and 2 retinopathy.

17 (16%) patients had evidence of pulmonary tuberculosis at the time of diagnosis. Nearly 11(10%) patients had coronary artery Disease. There was one patient who had peripheral vascular disease. The family history of diabetes was found in only 4 patients.

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32 (30%) patients had Hypertension at the time of diagnosis. Hypertension was taken as BP >140/90 mm of Hg. 32 (30%) patients had serum Triglyceride (TG) level >150 mg%. 21 (20%) patients had total cholesterol >200 mg%. 11(10%) patients had LDL cholesterol >130 mg%.

11 out of 54 males had metabolic syndrome according to NCEP ATP III guidelines while 21 out of 51 females had metabolic syndrome.

Table B shows the lipid profile and blood sugars of the study population.

Table B: Lipid profile and blood sugar of patients in study population

	Male	Female	Total
Total cholesterol	153 ± 49.1	183 ± 32.5	166 ± 44.5
LDL Cholesterol	90 ± 32.7	99 ± 26	95 ± 23.6
HDL Cholesterol	37 ± 7.8	40.2 ± 4.1	38 ± 6.3
Triglycerides	133 ± 45.3	153 ± 54.9	143 ± 50.9
Fasting Blood Sugar	185 ± 47	183 ± 33.7	184 ± 40.9
Post-Prandial Blood Sugar	309±96	309±58	309±79.8

All values in mean ± SD and in mg/dl

IV. DISCUSSION

We are a suburban medical college with a catchment area of villages situated nearby. We, therefore, get to see a lot of rural diabetic patients.

The anthropometric measurements of our patients in the present study reveal that the male patients had a BMI which was well within the normal range.

Although it is known that Indians are prone to developing diabetes at a lower BMI in comparison to the Western population, the BMI of rural males was nearly normal even by the Indian criteria. The abdominal circumference was also within accepted values for Asians. In contrast, the female patients had a higher BMI and abdominal circumference. Most of the female patients were housewives and led a sedentary lifestyle. In contrast, one fourth of male patients were farmers and led an active lifestyle. Shekhar et al³ in their study in Mysore on urban patients found the BMI to be 23.9 in males and 25.3 in females.

The family history of diabetes was not present in most of our patients. One reason for this could be a lack of knowledge about the disease. A study by Fatima et al⁴ done at our centre in 2011 revealed a significant ignorance about the disease.

30% of our patients were found to be Hypertensive using the criteria of ≥140/90 mm of Hg. 39% of female patients were found to be Hypertensive while 22% males had hypertension.

30% of female patients had a triglyceride level of more than 150 mg% while 20% males had TG level >150 mg%. 26% females had a cholesterol level of >200 mg% while only 6% of males had a cholesterol level >200 mg%. 13% of females had LDL cholesterol >130 mg% while only 6% males had LDL cholesterol >130 mg%. 30% males had HDL >40 mg% while none of the female patients had HDL cholesterol level of more than 50 mg%. So, most of our male patients did not have major lipid abnormalities.

The most common microvascular complication was neuropathy. It was present in 23% patients. Most of the patients presented with pain in lower limbs accompanied by tingling. Dutta et al⁵ in their study found peripheral neuropathy in 29% patients. Unadike et al⁶ found neuropathy in 38.8% of patients.

16% of our patients had retinopathy as evidenced by fundoscopy. The majority of these patients had grade 1 or 2 retinopathy. UKPDS⁷ had found 35% retinopathy in their patients. Ismat Erefez⁸ found retinopathy in 22.6% patients.

16% of our patients had nephropathy. Of these, 81% patients had microalbuminuria while 19% patients had overt nephropathy. Other studies on newly diagnosed patients have found a higher percentage (25-30%) of nephropathy. Weerasuriya⁹ in his study found nephropathy in 29% patients.

16% of our patients had pulmonary tuberculosis. Some of these patients had come for symptoms of tuberculosis and T2DM was diagnosed after their TB was established. It is known that patients with diabetes have a higher incidence of

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tuberculosis. According to WHO¹⁰ individuals with diabetes have 2-3 times the risk of developing tuberculosis than non-diabetics. According to a study by Catherine et al¹¹ diabetes accounted for 14.8% cases of tuberculosis in India. This study also concluded that prevalence of tuberculosis in diabetes had a higher prevalence in urban areas when compared to rural areas. In a study done in Imphal, screening of diabetic patients revealed a pulmonary tuberculosis prevalence of 27%.¹²

V. CONCLUSION

The present study on newly diagnosed rural diabetics shows that males at the time of diagnosis are not obese even by the Indian criteria. Infact they had a BMI slightly above the normal values. The waist circumference was also normal by Indian standards. The majority of male patients did not fit into the criteria of metabolic syndrome. Hypertension was the commonest comorbidity seen. The prevalence of complications is not high at the time of diagnosis. Neuropathy was the commonest complication. Pulmonary tuberculosis is fairly common in rural diabetics.

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