CLINICAL AND SOCIODEMOGRAPHIC PROFILE OF TYPE 2 DIABETES MELLITUS IN RURAL POPULATION OF VINDHYA REGION

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ABSTRACT

BACKGROUND

Diabetes Mellitus (DM) is a major epidemic of this century. The prevalence of Type 2 Diabetes Mellitus (T2DM) is 11% in urban areas, while it is 3% - 9% in rural areas. The prevalence of diabetes and its complications is now rapidly increasing in India among the poor in the urban slum dwellers, the middle class and even in the rural areas. This is due to changes in lifestyle and dietary habits associated with urbanisation and globalisation.

MATERIALS AND METHODS

500 type 2 diabetic patients from rural area of Vindhya region were included in the study. A detailed history and thorough clinical examination was done. Anthropometric measurements were recorded.

RESULTS

Out of 500 patients, 277 (55.4%) were males and 223 (44.6%) were females. Most of the patients, 303 (66.6%) were in the age group of 41 - 60 years with mean age of 57 yrs. In present study 71.8% patients were addicted to tobacco chewing, 28% were addicted to smoking and 11.2% were addicted to alcohol. 37.4% patients have positive family history. 17.4%, 61.8% and 20.8% patients have diabetes duration of < 5 yrs., 5 - 10 yrs. and > 10 yrs. respectively. 33% patients were on irregular treatment. 16.6% patients were hypertensive, 63.6% patients were overweight (25 - 29.9 kg/m²) and 5.2% patients were obese (> 30 kg/m²). In present study, 59.56% male patients have waist circumference (WC) ≥ 90 cm and 60.98% female patients have WC ≥ 80 cm. 25.60% patients have hypertriglyceridaemia and 18% patients have hypercholesterolaemia. 68.8% patients have poor glycaemic control.

CONCLUSION

The present study revealed that poor glycaemic control, irregular medication intake, obesity, dyslipidaemia and hypertension were prevalent in T2DM patients. Hence, the overall risk profile in patients from rural Vindhya region was very poor and needs improvement. These data can support health professional's actions to effectively maintain and provide a more comprehensive approach to management of T2DM.

KEYWORDS

Rural, Clinical Profile, Socio-Demographic Profile, Type 2 Diabetes Mellitus.

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BACKGROUND

Diabetes mellitus refers to a group of common metabolic disorders that share the phenotype of hyperglycaemia with disturbance of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both. Several distinct types of DM are caused by a complex interaction of genetic and environmental factors. Depending on the aetiology of the DM, factors contributing to hyperglycaemia include reduced insulin secretion, decreased glucose utilisation and increased glucose production.¹

DM is accepted as a worldwide epidemic with an estimated increase in prevalence from 2.8% in 2000

to 4.4% by 2030.² It has been estimated that the global burden of DM for 2015 was 415 million people, which is projected to increase to 642 million in 2040. In 2015 number of men and women with diabetes was 215.2 million and 199.5 million, and by 2040 it will be 328.4 million and 313.3 million. In 2015 number of diabetics in urban and rural area was 269.7 million and 145.1 million and by 2040 it will be 477.9 million and 163.9 million. In 2015 one in 11 adults had diabetes and by 2040 one in 10 adults will have diabetes.³ The Indian Council of Medical Research India Diabetes Study (ICMR-INDIAB study) showed that India had 62.4 million people with diabetes in 2011. These numbers are projected to increase to 101.2 million by 2030.⁴ The prevalence of T2DM is 11% in urban areas, while it is 3% - 9% in rural areas.⁵ The prevalence of diabetes and its complications is now rapidly increasing in India among the poor in the urban slum dwellers, the middle class and even in the rural areas. This is due to changes in lifestyle and dietary habits associated with urbanisation and globalisation.

Unfortunately, the vast majority of population (70%) in India live in rural areas. Screening for diabetes is seldom done in rural areas, resulting in a much greater burden of undiagnosed diabetics in rural areas. Most of these cases are

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type 2 diabetics. The earlier a person is diagnosed and management initiated, the better the chances of preventing harmful and costly complications.

MATERIALS AND METHODS

The present observational study was carried out in patients from rural areas attending Medicine Outpatient Department (MOPD) and those admitted in Department of Medicine, S.S. Medical College and associated S.G.M. Hospital, Rewa (M.P.) from 01st April 2016 to 31st July 2017. A total of 500 T2DM patients from rural population of Vindhya region were included in the study.

Inclusion Criteria

1. Type 2 diabetic patients living in rural area.
2. Age > 30 years.
3. Giving consent for study.

Exclusion Criteria

1. Type 1 diabetic patients.
2. Diabetic, but belong to urban area.
3. Not giving consent.

Diabetes was defined by American Diabetes Association (ADA) 2011 criteria- Plasma fasting blood glucose ≥ 126 mg/dL or 2-hour plasma post-glucose value ≥ 200 mg/dL or patients with classical symptoms of hyperglycaemia or hyperglycaemic crisis plus random blood glucose concentration ≥ 200 mg/dL (≥ 11.1 mmol/L) or HbA1c $> 6.5\%$.⁶ Hypertension was diagnosed according to JNC-7 criteria, those with systolic blood pressure > 140 mmHg and diastolic blood pressure > 90 mmHg or who were taking antihypertensive medication were considered to have hypertension.⁷ Blood sample for lipid profile was taken after an overnight fast. Dyslipidaemia was defined if patient had total cholesterol > 200 mg/dL, serum triglyceride > 150 mg/dL, serum HDL < 40 mg/dL in males, < 50 mg/dL in female and serum LDL > 100 mg/dL.⁸

The patients were included in the study after written and informed consent. Descriptive data like age, name, gender, religion, educational status, personal history, medical and medication history were taken after interviewing the patients. Patient's history and details were recorded on predesigned proforma. They underwent a thorough physical examination which included weight, height, waist circumference and Body Mass Index (BMI) which were calculated. Waist circumference was measured using a non-stretchable tape in horizontal position just above iliac crest. Data were completed by consulting medical reports of patients.

Data was at first arranged in Microsoft Excel 2016 worksheet, developed by Microsoft, Redmond, Washington. Data is expressed as mean $\pm$ standard deviation for continuously distributed variables and in absolute numbers and percentages for the discrete variables.

RESULTS

Out of the 500 patients studied, 277 (55.4%) were males and 223 (44.6%) were females. Most of the patients 303 (66.6%) were in the age group of 41 - 60 years with mean age of 57 yrs. In our study, 56% patients were illiterate. In our study 71.8% patients were addicted to tobacco chewing, 28%

tobacco smoking, 11.2% alcohol and 9.4% patients were addicted to both tobacco and alcohol.

In our study 37.4% patients have positive family history; 17.4%, 61.8% and 20.8% patients have diabetes duration of < 5 yrs., 5 - 10 yrs. and > 10 yrs. respectively.

Out of 500 patients, 66.8% patients were on oral hypoglycaemic agents (OHA), 16.4% were on insulin, 3% patients were treated with a combination of oral hypoglycaemic agents and insulin and 13.8% patients were not taking any type of treatment. 33% patients were on irregular treatment.

Variable	Category	No. of Patients	Percentage
Gender	Male	277	55.4%
	Female	223	44.6%
Age Group (Years)	31-40	30	6%
	41-50	150	30%
	51-60	153	30.6%
	61-70	90	18.8%
	>70	73	14.6%
Educational Status	Illiterate	280	56%
	Literate	220	44%
Addiction	Tobacco chewing	359	71.8%
	Tobacco smoking	140	28%
	Alcohol	56	11.2%
	Tobacco + Alcohol	47	9.4%
Family History	Present	187	37.4%
	Absent	313	62.6%
Diet	Vegetarian	427	85.4%
	Non-Vegetarian	73	14.6%
Duration of Diabetes	<5 years	87	17.4%
	5-10 years	309	61.8%
	>10 years	104	20.8%
Type of Treatment	OHA	334	66.8%
	Insulin	82	16.4%
	OHA + Insulin	15	3%
	No treatment	69	13.8%
Regularity of Treatment	Regular	335	67%
	Irregular	165	33%

Table 1. Demographic Profile of Patients

In our study, 16.6% patients were hypertensives.

Figure 1. Prevalence of Hypertension

In our study, 63.6% patients were overweight (25 - 29.9 kg/m²) and 5.2% patients were obese (> 30 kg/m²).

Figure 2. Body Mass Index Distribution

In our study, 59.56% male patients have WC ≥ 90 cm and 60.98% female patients have WC ≥ 80 cm; 25.60% patients have hypertriglyceridaemia and 18% patients have hypercholesterolaemia.

Figure 3. Distribution of Patients according to Lipid Profile and Waist Circumference

In our study, 31.2% patients have FBS ≤ 140 mg/dL and 68.8% patients have FBS > 140 mg/dL.

Figure 4. Distribution of Patients according to Glycaemic Control

DISCUSSION

In our study, 277 (55.4%) were males and 223 (44.6%) were females. Thakkar B et al⁹ reported prevalence of DM was 58% in males and 42% in females. Santosh YL et al¹⁰ reported prevalence in males of 58.23% and that in females of 41.76%. In our study, 303 (66.6%) patients were in the age group of 41 - 60 years with mean age of 57 yrs. Shah A et al¹¹ found that prevalence of DM was highest in the age group of 40 - 60

(56.12%) years followed by 60 - 80 (32.31%) years' age group. Manish Srishat¹² reported mean age of 56 years.

In our study 71.8% patients were addicted to tobacco chewing, 28% were addicted to tobacco smoking, 11.2% were addicted to alcohol and 9.4% patients were addicted to both tobacco and alcohol. According to a previous study done by Bhalerao SD et al,¹³ smoking was seen in 30.2% and alcohol consumption was found in 26.4% cases of T2DM.

In our study, 187 (37.4%) patients have positive family history. Abdollahi et al¹⁴ who observed 152 newly detected diabetic patients and reported family history in 63 patients (41.4%). Ranganayakulu K et al¹⁵ reported that positive family history was present in 1/3 of newly detected diabetics. According to all these studies, there was strong relationship between family history and diabetes mellitus. Relationship of family history with type 2 diabetes mellitus is due to strong genetic component.

In our study, 16.6% patients were hypertensives. Nanda KC et al¹⁶ observed that 21.7% patients had hypertension. Harzallah F et al¹⁷ reported prevalence of hypertension to be 22% among newly detected diabetic patients.

In our study, 63.6% patients were overweight (25 - 29.9 kg/m²) and 5.2% patients were obese (> 30 kg/m²). Krahulec B et al¹⁸ reported an average BMI of 25 - 30 kg/m² in 43.9%. Ganesh A et al¹⁹ found that on the basis of BMI 5% were obese, 49% were overweight and 46% patients were within normal range. Baijayanti Baur et al²⁰ concluded that Diabetes was more (63.6%) among patients who had BMI (Body Mass Index) of 25 kg/m² or more.

In our study, 59.56% male patients have WC ≥ 90 cm and 60.98% female patients have WC ≥ 80 cm. Borah M et al²¹ observed that central obesity (waist circumference; men ≥ 90 and women ≥ 80 cm) was 58% in diabetic population.

In our study, 25.60% patients have hypertriglyceridaemia and 18% patients have hypercholesterolaemia. Mandal M et al²² found hypercholesterolaemia and hypertriglyceridaemia in 34.29% and 25.71% patients respectively.

Shukla V et al²³ found that 30% patients had a serum triglyceride level of more than 150 mg% and 20% patients had total serum cholesterol of more than 200 mg%. Bali K et al²⁴ found that 36.5% patients have hypercholesterolaemia and 57.2% patients have hypertriglyceridaemia.

CONCLUSION

Our study was an attempt to highlight the scenario of T2DM in rural areas of Vindhya region. An insight into this region would hence prove valuable in formulating preventive and treatment policies specific for this region. The present study revealed that obesity, dyslipidaemia, family history of diabetes, uncontrolled glycaemic status, hypertension, non-adherence to treatment and addiction were highly prevalent in T2DM subjects. Hence, the overall risk profile was very poor. Thus, more thought should be given to the importance of multiprofessional team education in diabetic patient care, enlightening them about nature and progression of the disease and possible complications. They may benefit from periodical health promotion and education programs in the area of diet management, self-care and adherence to treatment. Clinicians involved with managing cases of diabetes should give sufficient importance and information

regarding lifestyle modifications, encouraging diet control and exercise pattern among their patients to achieve better control of diabetes.

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