

Evaluation of Sociodemographic Characteristics, Risk Factors and Associated Complications among Type 2 Diabetes Mellitus Patients – A Cross Sectional Study

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Abstract

Background: There are numerous modifiable and non-modifiable risk factors for type 2 Diabetes Mellitus (T2DM). They encompass excess body fat, imbalanced diet, lack of physical activity, tobacco use and excessive alcohol consumption. Effective treatment of diabetes requires that we must understand lifestyles, perceptions, family and social surroundings of the patients being treated. The present study was commenced to assess sociodemographic and other risk factors among diagnosed T2DM patients.

Material and Methods: A population-based Cross-sectional descriptive study was done among 86 diabetic (T2DM) patients from urban field practice area of one of the tertiary medical colleges in Khammam District of Telangana State. Sociodemographic as well as risk factors related information was collected by predesigned proforma. The data analysis was performed using SPSS Version 20 Software.

Results: Out of 86 patients, 32 (37.20%) were smokers [28 males and 4 females]. The study also revealed statistically significant association between gender and smoking in the study group ($\chi^2 = 19.37$, $p < 0.05$). The calculated values ($\chi^2 = 15.09$, $p < 0.05$) indicated statistically significant association between diabetic retinopathy and gender. Figure 2 illustrates the association between diabetic neuropathy and gender. However, the association was not statistically significant ($\chi^2 = 0.0018$, $p > 0.05$).

Conclusions: In developing country like India, comprehensive approach, which will address both traditional and socioeconomic factors, is becoming progressively vital in order to execute multidimensional public health programs as well as various community-based interventions for effective DM management.

Keywords: Complications; Sociodemographic; Risk Factors; Type 2 Diabetes Mellitus

Introduction

Type 2 Diabetes Mellitus (T2DM) incidence and prevalence have been growing exponentially over the last few decades globally. ¹ According to current International Diabetes Federation (IDF) estimates, in year 2017, there were 451 million adults with diabetes worldwide, a number that is predicted to touch around 693 million by year 2045. ²

Diabetes of all types can lead to complications in various parts of the body and can upsurge the risk of premature death. Likely complications comprise cardiac problems, stroke, renal failure, leg amputation, vision loss and neuropathies. During pregnancy, poorly controlled diabetes enhances the risk of fetal death and other complications ²

There are several well-known modifiable and non-modifiable risk factors for T2DM. They contain excess body fat, imbalanced diet, inadequate physical activity, tobacco smoking and alcohol consumption. ³⁻⁵ Morbidity, Mortality and subsequent disability due to diabetes can be reduced by restrictive ingestion of saturated and trans fat, alcohol, salt and sugars while promoting exercise and good nutrition. ³⁻⁵

In contemporary research, relationship between sociodemographic aspects and health is well recognized. Social and economic factors i.e. 'social determinants', creates an impact on health and cause differences and inequalities among individuals in communities. ⁶ T2DM and its complications are key reasons of morbidity and mortality in developing nations like India. Effective management of diabetes necessitates that we must understand lifestyles, perceptions, family and social environment of the patients being treated. ⁷

The present study was undertaken to assess sociodemographic and other risk factors among diagnosed T2DM patients. An attempt was also made to find out various complications among the similar groups.

Material and methods

This was population-based Cross-sectional descriptive study which was implemented among 86 diabetic (T2DM) patients. These patients were randomly chosen from public and private hospitals in urban field practice area of one of the tertiary health care institutes in Khammam District in Telangana State of India. Patients above 40 years old diagnosed cases of T2DM for more than one year, with or without complications of diabetes were considered as study participants. Ethical committee approval was obtained from the respective institute. An informed consent was also retrieved from study participants. Pre-designed and pretested proforma was used to collect socio-demographic information of participants. It included mainly gender, age, literacy, occupation, family income. Data regarding risk factors like smoking, alcohol consumption, family history of diabetes was collected by oral questionnaire method using pre tested proforma. Anthropometric measurements, Body mass index (BMI) and Blood pressure was measured using standard methods. Analysis and interpretation of the collected data was performed by using suitable statistical methods. Windows Excel and SPSS Version 20 for windows were used for data entry and analysis. Percentages, proportions and appropriate qualitative and quantitative tests of significance were applied.

Results

Table 1 indicates age and gender wise distribution of participants. The mean age of the study group was 54.14 \pm 8.47 years.

Table 1: Distribution of the study group according to age (n=86)

Age(Yrs)	Male (%)	Female (%)	Total (%)
40-50	17(34.7)	9(24.4)	26(30.2)
51-60	23(46.9)	18(48.6)	41(47.7)
61-70	8(16.3)	10(27.0)	18(20.9)
70 +	1(2.1)	0	1(1.2)
Total	49(100)	37(100)	86(100)

Majority (66.3%) of patients in the study group were literate while 33.7% were illiterate (Figure 1). In this study, most of the patients were agricultural workers followed by employees and then daily labourers (Table 2).

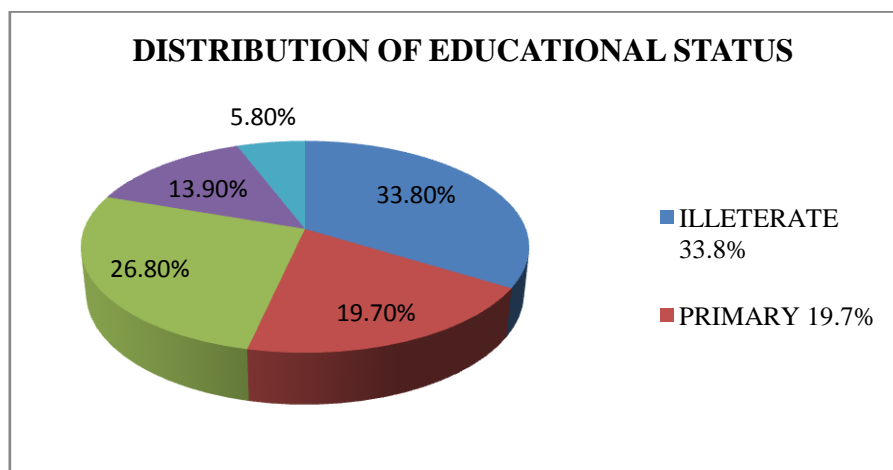


Figure 1: Distribution of study group according to educational status

Out of 86 patients, 63 (73.25%) patients had monthly family income (MFI) between 2936 INR to 20,000 INR. The remaining 23 (26.74%) patients had MFI less than 2936 INR.

Table 2: Distribution of study group according to occupation status (n=86)

Occupation Status	Number of Patients	Percentage
House Wife	12	13.9%
Employee	27	31.4%
Agriculture	29	33.7%

Daily Labour	14	16.3%
Pensioner	3	3.5%
Non-Working	1	1.2%
Total	86	100%

In the current study, socioeconomic status of patients was determined as per modified Kuppuswamy Classification. The majority of patients were from class 4. None of the patients in the study were from Class 1 and Class 5 (Table 3).

Table 3: Distribution of study group according to socio economic status (n=86)

Socio Economic Class	Number of Patients	Percentage
Class 2	33	38.3%
Class 3	17	19.8%
Class 4	36	41.9%
Total	86	100%

Majority (61.7%) of the study group patients had diabetic history of 1-5 years and 38.3% had duration of diabetic history above 5 years. Out of 86 patients, 32 (37.20%) were smokers [28 males and 4 females]. The study also revealed statistically significant association between gender and smoking in the study group ($\chi^2 = 19.37$, $p < 0.05$). The positive association was also observed between gender and alcohol drinking habits of patients ($\chi^2 = 7.75$, $p < 0.05$). Majority (54.7%) of the study group patients had normal BMI and 45.3% were overweight and obese. Around 26% of patients reported family history of diabetes. In this study, 69 (80.2%) patients were pre-hypertensive or hypertensive and 17 (19.8%) had normal blood pressure.

Table 4: Distribution of Diabetic retinopathy complication in the study group (n=86)

DiabeticRetinopathy	Number ofPatients	Percentage
Present	68	79%
Absent	18	21%
Total	86	100%

Table 4 shows one of the major and lethal complications among diabetic patients. The calculated values ($\chi^2 = 15.09$, $p < 0.05$) indicated statistically significant association between diabetic retinopathy and gender. Figure 2 illustrates the association between diabetic neuropathy and gender. However, the association was not statistically significant ($\chi^2 = 0.0018$, $p > 0.05$).

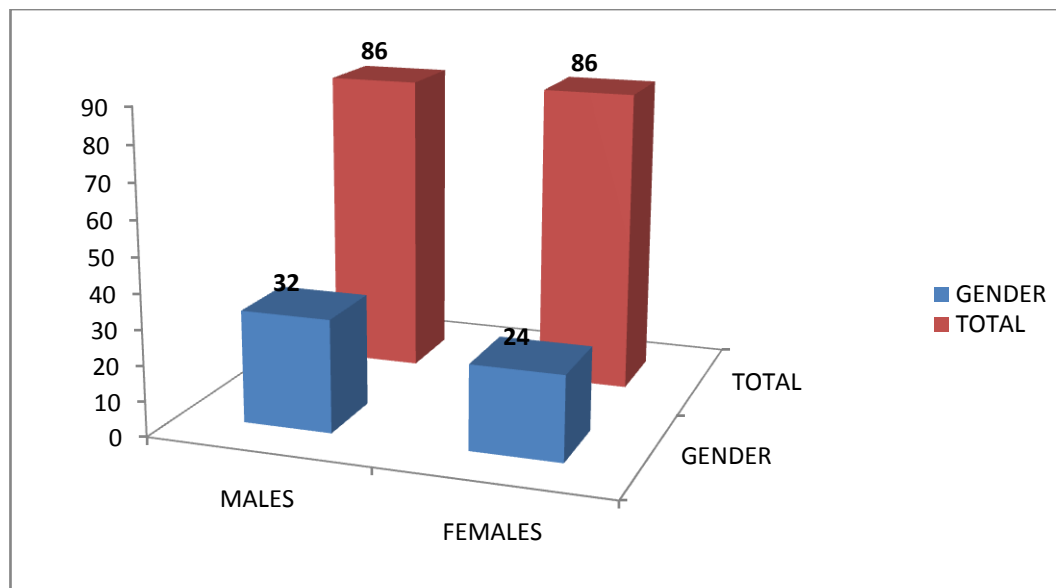


Figure 2: Distribution of Diabetic neuropathy complication in the study group

Nearly 44 (51.16%) patients were suffering from diabetic nephropathy whereas 37.2% of patients were having ischemic heart disease problems. Sixteen (18.60%) patients were suffered from peripheral artery disease. Around 5% of patients had episodes of cerebrovascular accidents. There was statistically significant association between these complications and gender of patient ($p < 0.05$).

Discussion

Among the 86 patients, majority of them belonged to the age group 51 – 60 years with mean age of 54.67 years and standard deviation of ± 8.92 years. In the study, 49 (57%) were males and 37 (43%) were females. In terms of literacy, 57(66.3%) of the study group are literate. Twenty nine (33.8%) patients were agricultural labourers. Twenty two (25.57%) patients had a monthly family income between 4994 -7322 INR.

A study done by Fernandez SD et al.⁸ mentioned the mean age of the participants of 51 years. Maximum age of the participants was 71 years and minimum age was 43 years. Males were made up 52.5 % of all the participants while female participants formed the remaining 47.5 % which was similar to the present study. Around half of the participants were unemployed (52.5 %).

Regarding the risk factors, it was shown that, 32 (37.2%) of the patients were smokers, 38 (44.2%) were alcoholic, 28 (32.5%) had a BMI between 25-29.9(over weight) and 23 (26.7%) of the patients showed a family history of diabetes. Forty (46.5%) of patients were pre-hypertensive and 29 (33.7%) were hypertensive related to co-morbidities .The risk factors like smoking, alcohol consumption and high body mass index were more in males compared to females similar to the study done by Kautzky-Willer et al.⁹ The study showed similar results where, it was estimated that 11.7% of T2DM cases in men and 2.4% in women were attributable to current smoking worldwide and regarding alcohol.A possible explanation for the sex dimorphism could be that men more frequently have worse drinking behaviour with heavy episodic drinking or that alcohol exerts sex-dimorphic effects on glucose metabolism and regarding BMI, BMI overestimates body fat mass in men, who generally have more fat-free muscle compared with women.

The present study showed that, out of 86 patients, 68 (79%) of them had diabetic retinopathy out of which 46 (68%) were males and 22 (32%) were females with male to female ratio 2.1: 1. A study by Guptha SK et al.¹⁰ reported the prevalence ratio of diabetic retinopathy for the female: male ratio was 2.5:1 for all diabetic patients. In another study carried out by GeirBertelsen et al,¹¹men had a higher prevalence of retinopathy compared with women (15.9% versus 14.0%) which was similar to the present study.

The current study revealed that, out of 86 patients, 44 (51%) had diabetic nephropathy out of which 32 (73%) were males and 12 (27%) were females showing high prevalence of diabetic nephropathy in males than in females. A study conducted by Trevor J Orchard et.al¹² reported thatmales showed a threefold increase in prevalence of diabetic nephropathy from 10 to 25 years duration, whereas females showed a more constant prevalence across these durations. A further rise in micro albuminuria was seen in males but not females at ≥ 30 years old duration, giving a combined prevalence of micro albuminuria and overt nephropathy at ≥ 30 years duration of 84% (males) and 59% (females). A study by Margaret K. Yu et al.¹³ indicated that women of all ages

had 28% decreased odds of Diabetic kidney disease DKD (OR 0.72, 95% CI 0.62–0.83); however, they had a greater prevalence of advanced Diabetic Kidney Disease (OR 1.67, 95% CI 1.05–2.64) compared to men. Women ≥ 60 years had increased odds of advanced Diabetic Kidney Disease.

The study had major limitation. Since this study was carried out on available limited sample, it cannot be extrapolated and generalized. Findings are applicable to the sample studied.

Conclusions

Diabetes Mellitus type 2 is influenced by socio-demographic factors. Apart from other T2DM risk factors, low socioeconomic status may considerably upsurge the risk for T2DM, but is frequently overlooked. In developing nation like India, comprehensive approach, which will address both traditional and socioeconomic factors, is becoming progressively vital in order to execute multidimensional public health programs as well as various community-based interventions for effective DM management.

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