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Co-morbidity pattern among type-II diabetes mellitus patients attending outpatient department of a rural tertiary care institute of North India

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ABSTRACT

Background: Diabetes mellitus (DM) describes a group of metabolic disorders characterized by high blood glucose levels. People with diabetes have an increased risk of developing a number of serious life-threatening health problems resulting in higher medical care costs, reduced quality of life and increased mortality. Knowledge of the prevalence about coexisting medical conditions in specific population groups helps healthcare providers and policymakers to allocate health resources efficiently and tailor diabetic care management to effectively utilize healthcare programs while decreasing healthcare expenditure. **Aims and Objectives:** To find out the pattern of comorbidity burden among Type-II diabetes mellitus patients attending outpatient department of a rural tertiary care institute of North India. **Materials and Methods:** Study setting: Outpatient department (OPD) of General Medicine of Rural Tertiary Care Institute in North India. **Study design:** Descriptive, cross-sectional. **Study population:** Patients who had already been diagnosed by a physician of having Type 2 diabetes mellitus (T2DM) and attended OPD for follow-up during study period i.e. 1st November 2019 to 31st January 2020. **Results:** Among 82 study participants, 36 were males and 46 females. A total of sixty-six study participants had co-morbidities along with diabetes mellitus. Most common co-morbidity recorded was related to cardiovascular system and neuropathies. Adherence to treatment was followed by 46 (56%) and dietary advice by 42 (51%) study participants. **Conclusion:** In light of the chronicity of the disease and increasing prevalence of diabetes with associated comorbid conditions, there is a need for clearcut guidelines to address health risks of diabetes with other comorbid conditions. There should be provision for regular formal health education sessions to address co-morbidities, complications due to diabetes.

Key words: Co-morbidity, type-II diabetes mellitus, outpatient department

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INTRODUCTION

Diabetes mellitus (DM) describes a group of metabolic disorders characterized by high blood glucose levels. People with diabetes have an increased risk of developing a number of serious life-threatening health problems resulting in higher medical care costs, reduced quality of life and increased mortality.[1] Persistently high blood glucose levels causes generalized vascular damage affecting the heart, eyes, kidneys and nerves and resulting in various complications.[2]

According to the estimates of DM burden, approximately in year 2019, it is estimated that 463 million people have diabetes and this number is projected to reach 578 million by 2030, and 700 million by 2045. Two-thirds of people

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with diabetes live in urban areas and three out of four are of working age. Over four million people aged 20–79 years are estimated to die from diabetes-related causes in 2019. As per estimates for 2019 in South East Asia Region, 8.8% of the adult population aged 20–79 years has diabetes which is equivalent to 87.6 million people, of whom 56.7% are undiagnosed. Most people (98.2%) in the SEA Region live in middle-income countries and, as a result, 99.2% of adults with diabetes are in such countries. India is home to the second largest number (77 million) of adults with diabetes worldwide. Adults aged 50–70 years have the highest diabetes prevalence among all age groups.[3]

Apart from being a chronic debilitating disease the high prevalence of co-existing chronic medical conditions or "co morbidities" make diabetes management an arduous task for the patient and for health care providers. Prior studies have proved that most adults with diabetes have at least one co morbid condition and 40% have three or more co morbid conditions; yet the perspective of the healthcare providers and treatment strategies are more oriented on management of diabetes alone.[4-7] For optimal health care delivery and developing strategies that support self-management among the ever growing population of diabetes patients, we need to understand that what the pattern is; number and type of co morbidities as it influence management of diabetes. These co morbid conditions may shift the providers' focus away from the diabetes.[8,9] Comorbidities may also serve as competing demands on patients' self-management resources, and potentially reduce the amount of time and energy left for diabetes self-care.[10-13] Various studies carried out in many parts of India focused solely on single co morbidities like depression or hypertension.[14-18] However a study on the prevalence of micro and macro vascular complications among type 2 diabetics was conducted by Ramachandra et al had concentrated on this fact on broader aspect.[19] Also a study conducted by Yadav et al described about Prevalence of hypertension and dyslipidemia among type 2 diabetics. Similarly various studies have reported the prevalence of dyslipidemia and hypertension among type 2 diabetics with focus on metabolic syndrome.[20-26]

Knowledge of the prevalence about coexisting medical conditions in specific population groups helps healthcare providers and policymakers to allocate health resources efficiently and tailor diabetic care management to effectively utilize healthcare programs while decreasing healthcare expenditure.[27] Detailed study on the other possible co-existing conditions will also help the healthcare providers to be more observant and be prepared accordingly for the multiple demands of the co morbidities and the outcomes which can be extrapolated to other parts of the country. However, it might differ due to geographical variations in the country. Our study will generate baseline data about the presence & pattern of co morbidity by revealing its variation with socio-demographic characteristics among diabetes patients attending Tertiary health care settings situated in such a deep-seated rural area of Haryana.

AIM AND OBJECTIVE

To find out the pattern of co morbidity burden among Type-II diabetes mellitus patients attending outpatient department of a rural tertiary care institute of Haryana

MATERIALS AND METHODS

Study setting

Outpatient department (OPD) of General Medicine of Rural Tertiary Care Institute in North India.

Study design

Descriptive, cross-sectional

Study population

Patients who had already been diagnosed by a physician of having Type 2 diabetes mellitus (T2DM) and attended OPD for follow-up during study period i.e. 1st November 2019 to 31st January 2020.

Exclusion criteria

Patients too ill to participate or with emergency health conditions or referred by Physician for further interventions were excluded from the study.

Study tool

The participating patients were interviewed using a predesigned and pretested semi-structured schedule.

Study variables

The study variables included questions about the time since existence of co-morbid conditions, eliciting information on whether the patient had any other chronic problems, family history and socio-demographic details (age, sex, place of birth, residence, ethnicity (general, scheduled caste and tribe, other backward classes) religion, educational level, marital status and type of family. The self reported conditions were ascertained by asking if it had been diagnosed by a doctor, and whether they were prescribed any medicines for the conditions from follow-up card.

Study analysis

Master chart was prepared. Co-morbidity pattern was analyzed in terms of the frequency of occurrence of each of the chronic diseases. Statistical analysis was done using SPSS version 22.0.

ETHICS

All study participants were explained about the study purpose and written informed consent was obtained prior to the interview. The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 1983.

RESULTS

The present descriptive cross-sectional study was carried out among patients attended a tertiary health care Institute who had been already diagnosed by a physician of having Type 2 diabetes mellitus (T2DM).

Table 1 shows the socio-demographic attributes of the patients. 36(44%) males and 46(56%) females were included in the study.56(66%) patients belonged to the rural background while 28(34%) patients belonged to the urban background. 18(22%) patients were not literate, 23(28%) studied up to primary, 28(34%) patients up to high school while 13(16%) patients studied between senior secondary to postgraduate.74(90%) of the patients were married while 8(10%) patients were unmarried. 31(38%) were having nuclear family while 51(62%) patients lived in joint family.

Table 2 shows family history of diabetes mellitus in study participants. 20 (24%) patients had positive family history of diabetes mellitus while 62(76%) patients, there was no family history of diabetes mellitus.

Table 3 shows the profile of co-morbidities among study participants.31(47%) patients had cardiovascular disease in form of hypertension, coronary artery disease etc., 18(27%) patients had neuropathy,8(12%) were having tuberculosis, 6(9%) patients were suffering from some mental health disorders. 3(5%) patients had other co-morbidities.

Table 4 shows adherence to treatment among the study participants. 46(56%) patients were adherent to treatment while 36(44%) of patients were non adherent to the treatment.

Table 5 shows the pattern of dietary advice followed by the patients. 42(51%) patients were following the dietary advice given by physician/ dietician while 40(49%) patients were not following the dietary advice.

Table 1: Socio-demographic attributes of study participants (n=82)

Attribute	N (%)
Gender	
Males	36 (44)
Females	46 (56)
Residence	
Rural	54 (66)
Urban	28 (34)
Literacy status	
Not literate	18 (22)
Up-to Primary	23 (28)
Up-to High school	28 (34)
Senior Secondary to Graduate & Postgraduate	13 (16)
Religion	
Hindu	72 (88)
Others	10 (12)
Marital status	
Married	74 (90)
Unmarried	08 (10)
Caste	
SC/ST/OBCs	39 (48)
Others	43 (52)
Type of family	
Nuclear	31 (38)
Joint	51 (62)

Table 2: Family history of diabetes mellitus observed study participants (n=82)

Attribute	Study participants' n (%)
Family history of diabetes found	20 (24)
Family history of diabetes not observed	62 (76)
Total	82 (100)

Table 3: Co-morbidity profile among study participants (n=66)

Co-morbidity	Study participants' n (%)
Cardiovascular diseases (Hypertension, coronary artery ds. etc)	31 (47)
Neuropathy	18 (27)
Tuberculosis	8 (12)
Mental health disorders	6 (9)
Others (retinopathy, nephropathy, osteoarthritis)	3 (5)
Total	66 (100)

Table 4: Adherence to treatment among study participants (n=82)

Attribute	Study participants' n (%)
Adherence to treatment found	46 (56)
Adherence to treatment not found	36 (44)
Total	82 (100)

DISCUSSION

The present cross-sectional descriptive study was conducted among patients attended out-patient department of General Medicine of a rural tertiary care institute during study period. The study recorded socio-demographic profile and pattern of co-morbidities among study participants. Among 82 study participants, 36 were males and 46 females. In this present study 54 study participants

Table 5: Dietary advice followed by the study participants (n=82)

Attribute	Study participants' n (%)
Advice as per dietary chart followed	42 (51)
Advice as per dietary chart not followed	40 (49)
Total	82 (100)

belonged to rural area and 28 were from urban settings. Mean age of study participants was 47 + 15 years.

A total of sixty-six study participants had co-morbidity along with diabetes mellitus. Most common co-morbidity recorded was Cardiovascular morbidities i.e. among 31 (47%) of study participants while neuropathies among 18 (27%). Tuberculosis was found among 8 (12%), mental health disorders6 (9%) and other co-morbidities likewise retinopathy, nephropathy and osteoarthritis were found among 3 (5%) of study participants.

The population of diabetic group had an increased risk of cardiovascular comorbidities likewise hypertension, dyslipidemia, and other ocular diseases compared with prediabetic group. A study conducted by Contreras F et al reported that hypertension is three times more prevalent in diabetics as compared with the nondiabetics.[28] However Tripathy et al investigating the prevalence of diabetic comorbidities in a North Indian population found frequent coexistence of DM, cardiovascular morbidity which is consistent with our findings.[29]

In this present study adherence to treatment was followed by 46 (56%) of the study participants and dietary advice by 42 (51%) study participants. Here it is worth mentioning here that all the patients were provided the medications and advice by the Dietician from the institute free of cost. Still there is lack of compliance to the treatment and restriction to dietary advice. It might be due to approachability to such a deep-seated rural area or might be lack of awareness about the co-morbidity and complications precipitated due to irregular/inadequate treatment.

Various studies reported treatment adherence has been with varying compliance rates ranging from 40% to 70%, respectively among co-morbidities likewise diabetes and hypertension.[30-32] While in contrary to it small proportions of diabetic patients are adherent to their treatment in other studies.[33,34] Also, Laskar A et al conducted a study on Lifestyle disease risk factors in a North Indian community in Delhi in year 2010. The authors reported higher compliance rate of 91.5% to anti-diabetic treatment as against 47% to antihypertensive treatment.[35] The study findings are not in congruence with the present study findings. Approachability due to remote area, lower literacy status, rural background and lack of awareness might be the causes of dietary restriction and treatment compliance.

CONCLUSION AND RECOMMENDATIONS

In light of the chronicity of the disease and increasing prevalence of diabetes with associated comorbid conditions, there is a need for clearcut guidelines to address health risks of diabetes with other comorbid conditions. Otherwise, the presence of coexisting medical conditions make its management complex for the patient and for the healthcare providers alike and may deteriorate health and quality of life. Additionally, such conditions may impair diabetes self-care management and adherence to medical treatment leading to adverse health outcomes. Additionally, this can impose excessive health expenditure and impose a huge financial burden on patients, their families, and the government.

There should be provision in the form of regular formal health education sessions by initiating diabetic clinic for awareness about adherence to treatment and dietary chart for patients and addressing co-morbidities, complications due to diabetes. Separate screening mechanism of complications due to diabetes mellitus should be placed in the institute. Further factors need to be explored through qualitative studies by focus group discussions for adherence to dietary advice and treatment compliance to address diabetes with other co-morbidities.

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