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Original Research Article

Risk factors of non communicable diseases among recently diagnosed diabetic patients in a tertiary care Hospital

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ABSTRACT

Background: There are many risk factors which determine the development of complications among diabetic patients, some of which are modifiable and some non modifiable. Further, taking care of risk factors and controlling other non-communicable diseases among diabetics will defer the complications due to diabetes.

Aims and Objective: To look for distribution of non-communicable disease risk factors among the diabetic patients.

Materials and Methods: The present cross-sectional study was conducted in Government Medical College & Hospital Jammu from 2019 to 2020. All the recently diagnosed patients (<1 year duration) of type 2 DM who were of ≥ 18 years of age, both males and females and were willing to participate in the study were included. Overall 70 recently diagnosed diabetic patients both males and females attended outpatient department of General Medicine of the Associated Hospital of the college during the study period.

Results: The mean age in study group was 48.9±11.78 years [30-75] years with a mean BMI of 24.3±3.28 kg/m^2. 22 patients [31.4%] were smokers; hypertension was seen in 13 patients [18.6%]; hypothyroidism in 4 patients [5.7%]; rheumatoid arthritis in 2 patients [2.9%] and epilepsy in 2 patients [2.9%]. Family history of diabetes was present in 29 patients [41.4%] and dyslipidemia in 12 patients [17.1%]. 31 patients [44.3%] had normal glycemic control with Hba1c of less than 7 while as 39 patients [55.7%] had poor glycemic control with Hba1c of greater than 7.

Conclusion: Significant proportion of the participants in our study had one or more risk factor present the development of a chronic disease or where suffering already from a non-communicable disease.

1. Introduction

Diabetes Mellitus (DM) is characterized by a state of chronic hyperglycemia, resulting from diversity of etiologies – the environmental and genetic, acting jointly. The underlying cause of diabetes is the defective production or action of insulin, a hormone that controls glucose, fat and amino acid metabolism with variable clinical manifestation and progression.[1]

It is the most common metabolic disorder and its prevalence in increasing in several regions of the world especially in developing countries like India. The prevalence of the disease is increasing rapidly due to change in lifestyle, more so in urban population because of adoption of western lifestyle regarding diet which included the use of unprocessed natural ingredients to highly refined, energy rich, fatty and sugary fast foods, physical activity and mental stress, which have direct as well as confounding impact on

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glucose metabolism and insulin sensitivity.[2]

Nearly half a billion people live with diabetes. Now it affects more than 425 million people and the number of people with diabetes may rise to 693 million in 2045 making it global emergency. India's diabetic population accounts for 74 million which is more in comparison to its wealthier nations.[3] The greatest number of cases of type 2 diabetes mellitus within next 20 years is predicted to occur in China and India, countries that earlier probably had relatively low rates of diseases that were considered to be associated with western affluence, that is in addition to family predisposition, obesity, dietary habits, alcohol intake and cigarette smoking has been considered in incidence of Non Insulin Dependent Diabetes Mellitus (NIDDM). According to WHO India will be world's diabetic capital in 2025.[4,5]

A number of pathogenic processes are shared in the process of diabetes, these array from autoimmune damage of the β cells of the pancreas with subsequent insulin insufficiency to aberrations that give rise to resistance to insulin action.[6] The onset of diabetes tends to be insidious, delaying the diagnosis and management. Type 2 DM is a progressive disease and hampers the quality of life of patients due to microvascular complications[7] which leads nephropathy, neuropathy, atherosclerosis, myocardial infarction and stroke.[8]

The simultaneous presence of multiple risk factors among diabetic patients for the development of other non communicable makes it important to identify them and educate the masses to prevent development of such risk factors. In the current study we tried to identify the distribution of different risk factors for non communicable diseases among diabetic patients and to educate them to prevent occurrence of multiple diseases and their complications.

2. Aims and Objectives

To look for distribution of non-communicable disease risk factors among the diabetic patients.

2.1. Study design

The present cross sectional study was conducted in the Department of Physiology, Government Medical College & Hospital Jammu from 2019 to 2020. All the recently diagnosed patients (<1 year duration) of type 2 DM who were of ≥ 18 years of age, both males and females and were willing to participate in the study were included. Overall 70 diabetic patients both males and females who attended outpatient department of General Medicine of the Associated Hospital of the college participated in the study.

After detailing the purpose and methodology of the study, written informed consent was obtained from all the study participants. Relevant demographic (age, sex), lifestyle characteristic (smoking, alcohol consumption) and socioeconomic status information was collected on a self designed proforma. Detailed history, physical parameters, general physical and systemic examinations were also recorded. Blood pressure was measured for all participants in the study using a standardized mercury sphygmomanometer in the right arm in the sitting posture. Glycated hemoglobin (HbA1c) and lipid profile were testing was also performed.

2.2. Statistical methods

The data was entered Microsoft Excel and analyzed using SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean ± SD & categorical variables were summarized as frequency and percentages.

2.3. Ethical clearance

The study was approved by institutional ethics committee in advance before its commencement.

3. Results

Table 1: Age and gender distribution of study subjects

		Number	Percentage
Age (Years)	< 50	31	44.3
	≥ 50	39	55.7
Mean ± SD (Range) = 48.9±11.78 (30-75)			
Gender	Male	38	54.3
	Female	32	45.7

In the study 31 (44.3%) of patients had age < 50 years and 39 (55.7%) had age ≥ 50 years. The mean age in study group was 48.9±11.78 years [30-75] years. In the study group, 38 patients were males [54.3%] and 32 patients were females [45.7 5].

Table 2: Distribution of study patients as per BMI

BMI	Number	Percentage
< 18.5	0	0.0
18.5-24.9	43	61.4
25-29.9	20	28.6
≥ 30	7	10.0
Total	70	100

BMI Mean ±SD (Range)=24.3±3.28 (19-31.3)

In study groups, 43 patients had BMI of 18.5-24.9[61.4%]. 20 patients had BMI of 25-29.9 [28.6%] and 7 patients had BMI. The mean BMI of study subjects was 24.3±3.28 kg/m2.

In the study group, 22 patients [31.4%] were smokers and 48 patients [68.6%] were non-smokers. Among comorbidities, Hypertension was seen in 13 patients

Table 3: Non communicable disease/ risk profile among study subjects

		Number	Percentage
Smoking status	Smoker	22	31.4
	Non smoker	48	68.6
Co-Morbidity	Hypertension	13	18.6
	Hypothyroidism	4	5.7
	Rheumatoid arthritis	2	2.9
	Epilepsy	2	2.9
Family History of Diabetes	Present	29	41.4
	Absent	41	58.6
Dyslipidemia	Yes	12	17.1
	No	58	82.9
HbA1c (%)	< 7	31	44.3
	≥ 7	39	55.7

HbA1c Mean±SD (Range) = 8.9±2.86 (5-14.5)

[18.6%]. Hypothyroidism was seen in 4 patients [5.7%]. Rheumatoid arthritis was present in 2 patients [2.9%] and epilepsy in 2 patients [2.9%]. Family history of diabetes was seen in 29 patients [41.4%] and no such family history was seen in remaining 41 patients [58.6%]. Dyslipidemia was seen in 12 patients [17.1%] and 58 patients [82.9%] had normal lipid profile. 31 patients [44.3%] had normal glycemic control with Hba1c of less than 7 while as 39 patients [55.7%] had poor glycemic control with Hba1c of greater than 7.

4. Discussion

Majority of participants in our study were in the age group of 50-59 years with a mean of 48.9±11.78 years. The above results were consistent with Knutson KL et al.,[9] mean age in their study was 57.3 years. Similarly, Azharuddin MD et al.,[10] found mean age to be 48.6±13.2 years. In a study conducted by Martorina W et al.,[11] the mean age was 56, with a range of 50-61 years. Similarly, Gozashti MH et al.,[12] in their study found mean age to be 58±11 years, which was consistent with our findings. In contrast, Lou P et al.,[13] in their study found mean age to be 45.1±14.4 years. So, our study is in agreement with most of the other studies conducted.

Out of 70 patients, 38 were males [54.3%] and 32 were females [45.7%]. This was consistent with findings of Lee SWH et al.,[14] where 59.2% of study subjects were males. In contrast, Kodakandla K et al.,[15] in their study that 58% were females and 42% were males. Nefs G et al.,[16] found in their study that 54% of study subjects were males.

In our study, 48 patients [68.6%] were non-smokers and 22 patients [31.4%] were smokers. This finding was consistent with a study conducted by Sakamoto R et al.,[17] on Japanese patients with type 2 diabetes, where 21.9% were smokers and 78.1% were non-smokers. Similarly, in a study conducted by Htut NH et al., (18), 90% of study subjects were non-smokers and 10% of patients were smokers. The results of both the studies are consistent with the findings of our study.

In present study, 43 patients [61.4%] had BMI of 18.5-24.5, 20 patients [28.6%] had BMI of 25-29.9 and 7 patients [10%] had BMI greater than 30. The mean BMI was 24.3±3.28kg/m^2. This was consistent with study conducted by Lou P et al.,[13] where mean BMI was 23.4±4.7 kg/m^2. Similarly, Song Y et al.,[18] found in their study the mean BMI of study subjects to be 24.20±5.46kg/m^2. Hur MH et al.,[19] found mean BMI in their study to be 25.74±4.49 which was consistent with our findings. Similarly Barakat S et al.,[20] in their study found mean BMI of 23kg/m^2 in 15.3% of patients, 27.5kg/m^2 in 25.2% and mean BMI of 33kg/m^2 in 27.3% of their patients. In contrast, Martorina W et al.,[11] in their study found mean BMI to be 30kg/m^2, which was inconsistent with the findings of our study. Knutson KL et al.,[9] conducted a study on volunteers at University of Chicago Hospital and in their study found mean BMI to be 35.8±9.8 kg/m^2 that was inconsistent with our findings. In the same manner Htut NH et al.,[21] in their study on a total of 289 patients with T2DM in Yangon Myanmar found mean BMI of greater than 30kg/m^2 in 64.4% of their patients, that was inconsistent with the findings of present study. This may be partly due to the difference in sample size of our studies and partly due to racial & geographical difference.

Hypertension in our study was seen in 18.6% patients, hypothyroidism in 5.7%.and rheumatoid arthritis and epilepsy in 2.9% of patients, whereas no comorbidity was seen in 69.9% of patients. This was consistent with findings of a study conducted by Lou P et al.,[13] where hypertension was seen in 16.2% of study subjects. A study directed by Htut HN et al.,[21] on 1300 diabetic patients where hypertension was most commonly found comorbidity [61%] in study subjects. In contrast, in a study supervised by Mammoo FR et al.,[22] hypertension was seen in 38.1% of study subjects, that was inconsistent with our findings.

Family history of diabetes was present in 41.4% of subjects and absent in remaining of 58.6% of patients in our study. Similarly, Martorina W et al.,[11] found family history of diabetes in 51% of study subjects that was consistent with our findings. In contrast, Lou P et al.,[13] conducted a cross-sectional survey of risk factors of diabetes mellitus among residents living in Xuzhou city which was conducted on 23742 subjects, found family history of diabetes in 5% of study subjects only, that was in apposition with our findings which may be due to their large sample size.

In our study, dyslipidemia was seen in 17.1% of study subjects and normal lipid profile was seen in remaining 82.9% of patients. Similarly Tavares A et al.,[23] found dyslipidemia in 19.5% of study subjects that was consistent with our findings. Likewise in a study conducted by

Gozashti MH et al.,[12] dyslipidemia was seen in 25.7% of patients that was similar to our findings. Zhang P et al., (24) in their study found dyslipidemia in 24.6% of patients that was again consistent with the findings of our study. In contrast, Sakamoto R et al.,[17] in their study found dyslipidemia in 74% of patients, that was inconsistent with our findings. Hur MH et al.,[19] in their study found dyslipidemia in 60% of study subjects. The less occurrence of dyslipidemia in our study may be due to the reason that we included only newly diagnosed cases of diabetes.

In present study, normal HbA1c level of less than 7 was seen in 44.35% of study subjects, and HbA1c levels of greater than 7 was seen in 55.7% of patients. This was consistent with findings of study conducted by Sakamoto R et al.,[17] where HbA1c of less than 7 was seen in 41% of study subjects and HbA1c of greater than 7 was seen in 59% of patients. Similarly Lee SW et al.,[14] in their study found HbA1c of less than 7 in 39% of study subjects and HbA1c of greater than 7 in rest of study subjects. In a study conducted by Kodakandla K et al.,[15] good glycemic control was seen in 53% of the patients and poor glycemic control was seen in 47% of patients, which was consistent with our findings. Incontrast, in a study conducted by Htut NH et al.,[21] HbA1c of less than 7 was seen in 29.4% of study subjects and HbA1c of greater than 7 was seen in 70.6% of patients. This was inconsistent with our findings. Differences in the size and composition of the population, prevalence of diabetes, most importantly, the level of health expenditure contributed to these region-and-country differences. The mean HbA1c level in our study was 8.9±2.86 with a range of 5-14.5. This was in consistent with findings of study conducted by Gozashti MH et al.,[12] where mean HbA1c level was 7.8±1.4. A study conducted by Sakamoto R et al.,[17] the mean HbA1c level was 7.1. Similarly, in a study conducted by Hur MH et al.,[19] the mean HbA1c level was 7.83±2.01.

5. Conclusion

The presence of more than one non-communicable disease and their risk factors in diabetic patients increases the chances of long term complications. If risk factors and other NCDs are controlled at the earliest through proper screening from time to time among diabetic patients the overall quality of life can be improved to a great extent.

6. Source of Funding

None.

7. Conflict of Interest

None.

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