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Prevalence, management and complications of diabetic patients in Pabna city

Abstract

Diabetes is one of the leading causes of death and its prevalence is increasing day by day. This survey was conducted by direct interviewing to the diabetic patients. In this study, the interviewees were the diabetic affected patients of Pabna district. About 1100 persons were interviewed among them 37.55% were male and 62.45% were female. Most of the patients have onset of diabetes at 41-50 years age. Most of our observed patients have suffered from diabetes between 1-5 years (62.64%) followed by 6-10 years (25.18%). Here 3.18% patients have BMI ≤18.5, 47.55% have between 18.5-24.9, 39.55% have BMI 25.5-29.9 and 9.73% have BMI ≥30. Here 93.45% diabetic patients have blood glucose level of >7 mmol/L. The diabetic patients also suffered from retinopathy 50.36%, neuropathy 19.73%, nephropathy 23.55% and foot problem 43.36%. About 63.27% are taking diet, 56.91% are taking exercise and 93.91% are taking drug for treating diabetes. It was found that the patients are suffering from different other diseases. The patients need to be aware about the potential risk of other diseases.

Keywords: diabetes, diet, sitting, exercise, BMI

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Introduction

In 2011, the global prevalence of diabetes was 8% which is predicted to 10% in 2030.[1] The prevalence of diabetes in 2021 was 12.1% in urban areas and 8.3% in rural areas. In high income countries this prevalence (in 2021) was 11.1% and in low-income countries 5.5%. In 2021 the total diabetes related expenditure was 996 billion USD globally.[2] The prevalence of diabetes varies significantly from country to country due to genetic and environmental factors. Recently the prevalence of type 2 diabetes in rising in industrialized countries.[3] Previous days, it was assumed that type 2 diabetes mainly affects older people but in recent times children are also affected. Among diabetic patients ≥90% has type 2 diabetes.[4] Around 80% of the diabetic patients are living in low- and middle-income countries.[1] Regions mainly Asia and eastern Pacific region are diabetic affected region.[5,6] China was the home of highest number of diabetic patients (90.0 million) followed by India (61.3 million) and Bangladesh (8.4 million).[1] About half million children below age of 14 lived with type 1 diabetes in 2015 which highest prevalence in Europe, North America and South-East Asia.[7] Another form of diabetes, gestational diabetes has the prevalence of 35% Mazumder, T. et al., (2022).[8]

Methodology

Research type

This is survey-based research and was conducted by direct interviewing to the diabetic patients.

Study design

This study design was chosen in order to measure the prevalence, cause and management strategies of diabetic patients in Pabna city. Actually, there is no such work was conducted in Pabna which inspired us to carry out this work.

Study population and sampling

The interviewers visited the hospitals of Pabna city for data collection. Some of the participants were interested to carry the study whereas some of them totally ignored this study or didn't pay attention to this study. About 1100 persons who are duelers of slums of Pabna city was interviewed.

Geography and demography of the study area

One of the oldest districts, Pabna was founded in 1828. It is surrounded by Natore and Sirajganj district in North side, and Manjkganj district in East side and Kusthia district on South side. It lies between 23°48' and 24°21' north latitudes and between 89°00' and 89 °44' east longitudes. It has a population of about 2,523,179 of which 50.05% is male and females 49.95%.[9]

Data collection

The diabetic patient was interviewed by data collectors. The data collectors were trained up before conducting the interview. Total 22 questions were included in the questionnaire. The English questionnaire and technical terms were explained by Bengali to the patients and the Bangla answer were converted into English answer by data collectors. Incomplete questionnaires were excluded.

Ethical issues

Verbal consent were taken from the patients during data collection. The objective of this study was explained to the patients before starting the interview.

Statistical analysis

The collected data were cleaned and analyzed by Microsoft Excel 2013 software.

Result

This study was conducted on total 1100 diabetic patients among them 37% was male and 62.45% was female. About 20.73% participants are 31-40 years old, 28.00% are 41-50 years old and 25.82% are 51-60 years old. Most of the patients have onset of diabetes on 41-50 years age. But significant percentage of patients have generation of diabetes at 31-40 years age (25.91%) and 51-60 years age (20.27%)

and 21-30 years age (14.18%). Most of our observed patients have suffered from diabetes between 1-5 years (62.64%) followed by 6-10 years (25.18%). Education is one the factor that helps to reduce the occurring and suffering of diabetes and in our study 39.27% diabetic patient are uneducated, 17.45% are primary educated, 22.27% are secondary educated. Interestingly more than ninety percent of our studied diabetic patient are married (Table 1).

Table 1 Demographic characteristics of patients

Variable	Parameter	Frequency (n=1100)	Percentage (%)
Gender	Male	413	37.55
	Female	687	62.45
Age	≤20y	12	1.09
	21-30y	79	7.18
	31-40y	228	20.73
	41-50y	308	28
	51-60y	284	25.82
	≥61y	189	17.18
Onset of diabetes	≤20y	28	2.55
	21-30y	156	14.18
	31-40y	285	25.91
	41-50y	333	30.27
	51-60y	223	20.27
	≥61y	75	6.82
Duration of diabetes	1-5y	689	62.64
	6-10y	277	25.18
	11-15y	92	8.36
	16-20y	31	2.82
	21-25y	7	0.64
	≥26y	4	0.36
Educational status	Higher Education	132	12
	Higher Secondary	99	9
	Secondary	245	22.27
	Primary	192	17.45
	Illiterate	432	39.27
Marital status	Married	999	90.82
	Divorced/Widow	69	6.27
	Unmarried	32	2.91

BMI is an indicator of prospective diabetic patient. The higher the BMI the higher the possibility of getting diabetes. Here 3.18% patients have BMI ≤18.5, 47.55% have between 18.5-24.9, 39.55% have BMI 25.5-29.9 and 9.73% have BMI ≥30 (Figure 1).

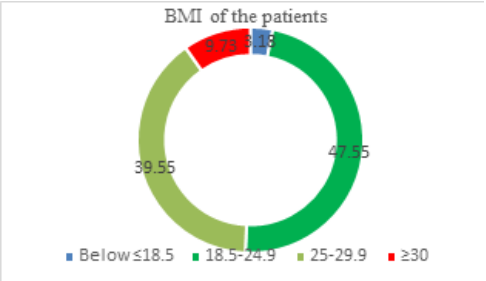

Figure 1 BMI of the patients.

The level of diabetes can be identified by the level of blood glucose level. In this study 34.91% diabetic patient monitor their glucose level regularly. Here 93.45% diabetic patients blood glucose level of >7 mmol/L (Figure 2).

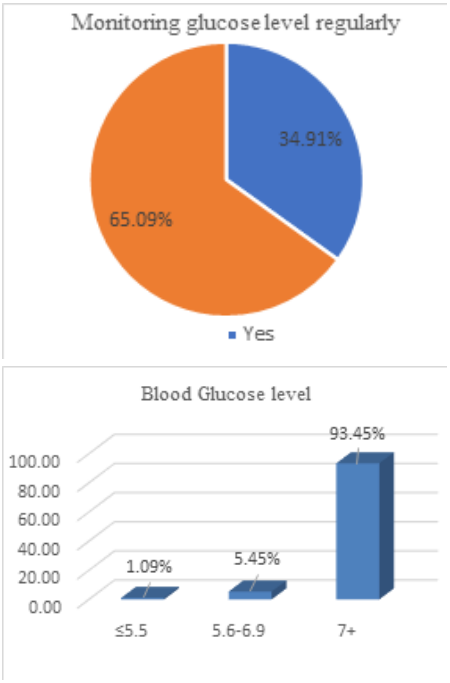

Figure 2 Blood glucose level of patients.

Hypertension is directly related with diabetes and in this study, it was found that 31.73% diabetic patients have hypertension. The diabetic patients also suffered from retinopathy 50.36%, neuropathy 19.73%, nephropathy 23.55% and foot problem 43.36% (Figure 3 & 4).

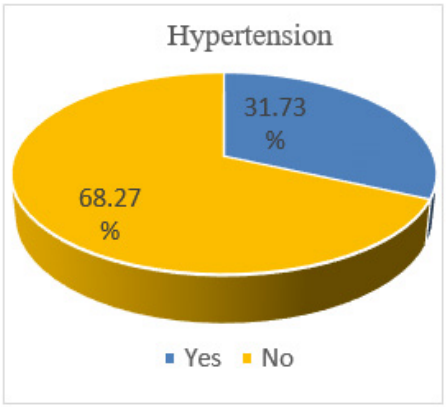

Figure 3 Hypertension of diabetic patients.

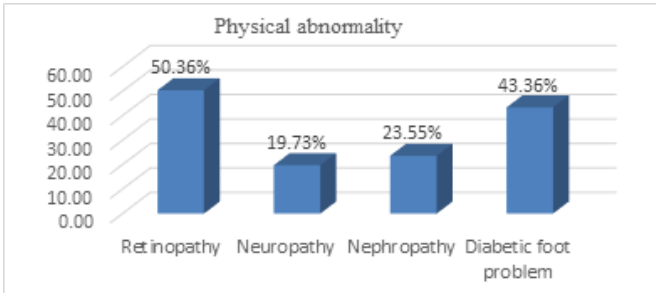

Figure 4 Physical abnormalities faced by diabetic patients.

The patients have followed different types of strategies for treating diabetes. About 63.27% are taking diet, 56.91% are taking exercise and 93.91% are taking drug for treating diabetes. Among the

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medication, 38.09% are taking sulfonyl urea, 39.64% are taking DPP-4 (dipeptidyl peptidase 4), 44.73% are taking Biguanide and 41.00% are taking insulin (Figure 5 & 6).

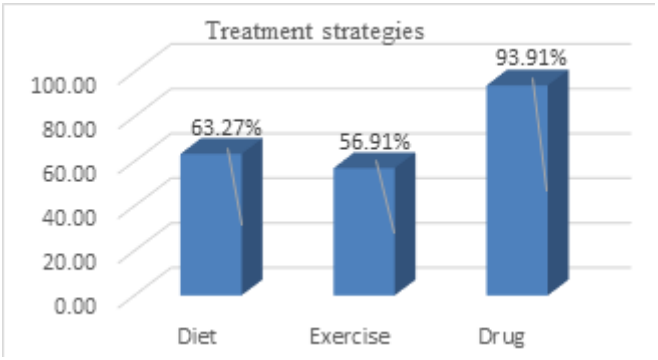

Figure 5 Treatment strategies.

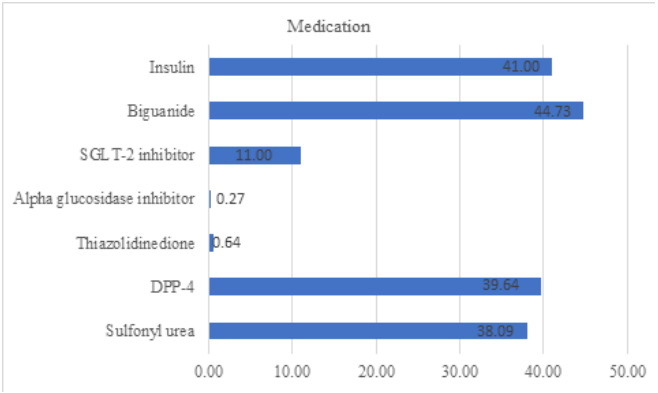

Figure 6 Medication used by patients.

Among all the patients, 22.09% sited ≤2 hour/day while 21.73% sited more than 6 hours per day. Only 15.36% drink or take alcohol regularly. About 25.91% patient slept ≤5 hours/day, 23.73% patient slept 6 hours/day, 23.64% slept 7 hours/day and 20.82% slept 8 hours/day (Table 2).

Table 2 Daily activities of diabetic patients

Variable	Parameter	Frequency (n=1100)	Percentage (%)
Sitting/day	≤2 hour	243	22.09
	2-4 hour	330	30
	4-6 hour	288	26.18
	>6 hour	239	21.73
Smocking/Alcohol	Yes	169	15.36
	No	931	84.64
Sleep/day	5≤	285	25.91
	6	261	23.73
	7	260	23.64
	8	229	20.82
	9	58	5.27
	>9	7	0.64

Family history is one of the risk factors of diabetes and here it was found that 42.18% has family history of diabetes. In this study two third of the patient have mentioned that they have direct impact of diabetes on their regular activities (Figure 7 & 8).

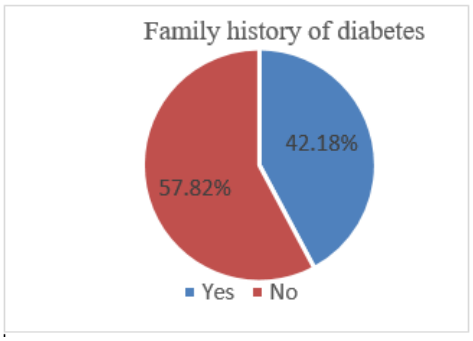

Figure 7 Family history of diabetes.

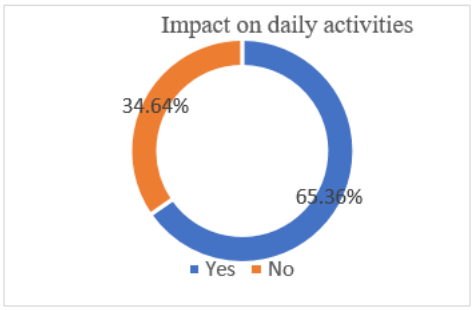

Figure 8 Impact on daily activities.

Discussion

This study was conducted to determine the prevalent, complication and treatment strategies of diabetic patients. Diabetes, which is a chronic disease which occurs due to lacking of pancreas of producing sufficient insulin. Diabetes also produced when body failed to respond against produced insulin. Sometimes, it is misunderstood with hyperglycaemia. Hyperglycaemia is a condition of elevated blood glucose level which restores normally without the necessity of medicine. In 2014, the prevalence of diabetes was 8.5%. In 2019 diabetes was the cause of death of approximately 1.5 million people.[10-12] In this study it was found that, the prevalence of diabetes was increased after 30 years old. The incidence of diabetes was decreased as the educational level of the patients was decreased. Thus, it can be said that, education plays a vital role in preventing diabetes, because educated people are more aware about the risk factor of diabetes.

Body mass index (BMI) is an indicator of sound health. BMI is calculated by diving the patient's weight (in kilograms) by square of the height of the patient (in meter). If a person has BMI below 18.5 which means they are under weight, BMI 18.5-24.9 is an indicator of healthy weight, BMI 25-29.9 is an indicator of overweight and BMI 30-39.9 is an indicator of obesity .[13] In this study about forty percent (39.55%) diabetic patient are overweight (BMI 25-29.9) and 9.73% patient are obese (BMI >30). Blood glucose test is used to measure blood sugar level and diabetes of a person. Normal blood glucose level ranges between 70-99 mg/dL or 3.9-5.5 mmol/L. Fasting blood glucose between 100-125 mg/dL (5.6-6.9 mmol/L) is an indicator of prediabetes and blood glucose level is 126 mg/dl (7.0 mmol/L) or higher is an indicator of diabetes.[14] Here more than 90% of the people have blood glucose level is >7 mmol/L. Regular blood glucose helps to control the diabetes but, in this study, founds that only 65.09% diabetic patient regularly check their blood glucose level. The patients are suffering from additional diseases because diabetes is directly linked with many other diseases. Here, the patients have hypertension

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31.73%, retinopathy 50.36%, foot problem 43.36% and nephropathy 23.55%. Among the medication, sulfonyl urea, biguanide, DPP-4 and insulin are used by the patients.

There is direct association between sitting and diabetes. Åsvold, B.O. et al. (2017) found that sitting ≥8 h/day increased diabetes risk 17% compared to the sitting ≤4 h/day.[15] Here, 22.09% sited ≤2 hour/day, 30% patient sit 2-4 hour/day, 26.18% sit 4-6 hour/day and 21.73% sited more than 6 hours per day. In this study, only 15.36% diabetic patient drink or take alcohol regularly. Similar types of result were obtained in the previous study. Silva, R.D. et al (2015) was found the prevalence of smoking in diabetic patient 12.9% and prevalence of alcohol was 11.8% in diabetic patient.[16] About 25.91% patient slept ≤5 hours/day, 23.73% patient slept 6 hours/day, 23.64% slept 7 hours/day and 20.82% slept 8 hours/day. A considerable proportion of diabetic patients have family history of diabetes. Drug, diet and exercise all are using for treating diabetes. Medicine is used by 93.91% patient; diet control is maintained by 63.27% and exercise is followed by 56.91% patients.

To prevent diabetes, the consumption of local fruits should be increased because it was established that fruits namely mango,[17] wood apple,[18] guava,[19] capsicum[20] berries[21] can prevent diabetes. It should be noted that there is high possibility of error during prescriptions in developing countries like Bangladesh.[22,23] So, fruit consumptions, increasing physical activity, leading healthy lifestyle should be followed.

Conclusion

This study determined the current scenario of diabetic patients of Pabna city. It was found that the patients are suffering from different other diseases. The patients need to be aware about the potential risk of other diseases. In addition, awareness program should be developed to reduce the incidence of diabetes. Further work is needed to investigate more details of the diabetic patients of this city. Similar types of study should be conducted on other areas of the country.

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Conflicts of interest

Authors declare that there is no conflict of interest.

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