KNOWLEDGE OF DIABETES AMONG TYPE 2 DIABETES PATIENTS AND THEIR BLOOD GLUCOSE LEVEL- A CROSS-SECTIONAL STUDY

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ABSTRACT

BACKGROUND
Prevalence of type 2 diabetes mellitus is rising worldwide and increasingly being recognised in relatively young people due to the high prevalence of environmental and genetic risk factors. The objectives of this study is to assess knowledge, lifestyle habits and blood glucose level of diabetes patients.

MATERIALS AND METHODS
A cross-sectional study was conducted among 100 diabetics and systematic random sampling was used for selection of study subject. We used oral questionnaire for assessing knowledge, lifestyle habits, and height and weight measured to calculate BMI. The means, standard deviations and frequencies were calculated. For inferential statistics, Chi-square (X\(^2\)) test was used to determine the strength of association between dependent and independent variables. P values < 0.05 were considered as statistically significant.

RESULTS
Eighty five percent (85%) of the respondents knew that diabetes is due to high blood sugar, familial (43%), sedentary workers can suffer (44%) and it affects kidney, heart, liver and eyes (49%). Fifty two percent among participants did physical activities for one to two hours per day, 17% smoked and majority were rice eaters. It was found that 57% of the respondents’ HbA1C levels were less than 7.0% suggesting control of diabetes. The high cholesterol level is associated with high HbA1C values (p= 0.002).

CONCLUSION
The control of blood sugar among diabetes patients was fifty seven percent in spite of having good knowledge. More than half of participants having some type of physical activities, which may need to improve in terms of hours per day or hours per week. The literacy and lifestyle habits did not show any significant association with diabetes control among the study population.

KEYWORDS
Diabetes Mellitus Type 2, Knowledge, Lifestyle Habits, Blood Sugar Level and Diabetes Control.
Those diabetic patients who are having low literacy and low knowledge might be facing troubles in learning self-care skill for glycemic control.\(^{(15)}\) This could be caused by illiteracy, cognition influence, decreasing vision and hearing status as a result of aging process.\(^{(16)}\) Among patients with low literacy, intervention patients were more likely than control patients to achieve goal HbA1C levels. Patients with higher literacy had similar odds of achieving goal HbA1C levels regardless of intervention status.\(^{(17)}\)

Our intention of this study is to assess knowledge among type 2 diabetes patients and their blood glucose level at tertiary care hospital in Agartala city located in the North Eastern part of India. It can help create awareness among diabetes patients and prevent disability. It may be helpful to administrators for better planning and implementation in future.

**MATERIALS AND METHODS**

A cross-sectional study was conducted among 100 Diabetic patients attending Outpatient Department (OPD) of a tertiary care hospital of Agartala city, located in the North-Eastern part of India. The sample size was calculated using formula for single proportion \(Z_{1-\alpha/2}^2[p(1-p)]/L^2\). The \(p\) is assumed 0.5 with 95% confidence interval and 5% level of significance. The margin of error was taken as 20% in the present study. The systematic random sampling technique was used for selection of the study subjects. Simple random sampling (lottery method) was used for the first patients to get the starting point. Thereafter, depending on sampling interval patients coming to the clinic were enrolled in the study until the required sample size was achieved. Patients aged \(\geq 20\) years diagnosed with DM: for duration of six months or more were included in the study. Seriously ill patients and requiring dialysis were excluded from the study. Diabetes was defined as fasting plasma glucose \(\geq 126\) mg/dL and post-prandial plasma glucose \(> 200\) mg/dL. Data were collected from individuals attending OPD using structured interview schedule. The questionnaire for the interview has had four sections: socio-demographic, knowledge, lifestyle habits, anthropometry and laboratory assessment. We also calculated BMI for the selected individuals. The independent variables to explain the knowledge etc. included patient related factors and social factors etc. The questionnaire was prepared in English and translated into local language while doing the interview. Each item had definitive ‘yes/no’ and other related response key. A scoring system was developed, whereby the total number of correct responses for the knowledge section was calculated for each respondent and percentage was created. Each correct answer was given one mark and the total mark calculated out of 100. Knowledge was graded as very good (score > 80%), good (60% - 80%), average (40% - 60%) and poor (< 40%). Each questionnaire took approximately 15 minutes to administer. Data were obtained regarding glycemic control as part of the routine screening. We considered the HbA1C cut-off value of 7.0% or above for poor control of diabetes.\(^{(18)}\) The participants were requested to participate in the study voluntarily. Informed written consent was obtained from the participants before conducting the study. The information so collected was kept confidential and anonymous. The approval from Institutional Ethics Committee was obtained before conducting the study. The data were collected from June to September 30, 2017.

**Data Analysis**

Data were checked, sorted, categorised and coded. After coding the data were entered to the computer to make it ready for processing and analysis. It was analysed by using the Microsoft Excel 2007 software. For Chi-square test, we used Epi-Info version 6.0. Descriptive statistics such as means, standard deviations and frequencies were calculated. For inferential statistics like Chi-square (\(X^2\)) test, ‘t’ test were used to determine the strength of association between dependent and independent variables. \(P\) values < 0.05 were considered as statistically significant.

**RESULTS**

Majority (36%) of the respondents were from 40 - 50 years age group, who were attending the diabetic clinic of the hospital. The overall mean (SD) age of the study subjects was 52.89 (± 12.031) years. The mean (SD) age for male and female were 55.13 (± 11.650) years and 50.46 (12.083) years respectively. The proportion of male and female were almost similar (Male 52%, Female 48%). More than fifty percent (51.0%) studied up to higher secondary level, 42% housewives and 65% of respondents’ income was Rs.<10,000 only (Table 1). Sixty two percent (62%) were from urban community and 76% belonged to joint family. Sixty nine percent were from general category, 3% indigenous (Schedule Tribe) and remaining 28% from schedule caste (SC) category. Seventeen percent (17%) of the respondents were smokers, 36% used alcohol occasionally and 64% rice eaters (Table 2). Eighty five percent (85%) of the respondents knew that diabetes is due to high blood sugar, familial (43%), sedentary workers can suffer (44%), affecting kidney, heart, liver and eyes (49%), whereas 61% said preventable. The knowledge scores in very good, good and average categories were 74%, 24% and 2% respectively. It was found that 57% of the respondents’ HbA1C level were less than 7.0% suggesting control over diabetes. We further found that only 24% and 76% respondents’ fasting and 2 hrs. post glucose level were < 125 mg/dL and \(\leq 200\) mg/dL respectively. The lipid profile of 76%, 83%, 66% and 81% respondents’ total cholesterol, HDL, LDL and VLDL levels in terms of gm/dL were \(\leq 200, > 200\), within 70 - 130, > 35 respectively (Table 3). Among those who were having sugar control (HbA1C < 7.0%), 75.0% of them do physical activity for 60 - 120 minutes per day. The literacy, gender, physical activity and its duration, knowledge on diabetes, duration of treatment and BMI did not show any significant association with blood sugar control. But interestingly the higher cholesterol level is associated with uncontrolled blood sugar level (\(p<0.002\)) (Table 4).

<table>
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<th>Variables</th>
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DISCUSSION

This study was conducted in a tertiary care hospital of Agartala city among 100 diabetics during June to September 2017 to assess knowledge of diabetes, lifestyle habits among DM2 patients and their blood sugar level. Knowledge on diabetes is crucial in controlling diabetes which includes healthy practices like exercise or regular physical activities, healthy food eating, avoidance of junk foods and self-care practices. The diabetes related knowledge can improve outcome of treatment and further help in preventing complications. In present study, 40 - 50 years’ age group were representing more than other age group and male and female proportions were almost equal. The overall mean (SD) age was 52.89 (± 12.031) years. A study from Western Nepal showed that the greatest number of patients was in the age group of 51 - 60 years and number of males was higher than females. It could be due to proportion of DM2 patients were predominantly seen in these middle age groups.
Ninety five percent of the respondents were literate and forty two percent were housewives. In the present study, most of the respondents were from General Category (69%) and only 3% from ST or indigenous population. A study from Nepal also reported that the participants’ mean age (±SD) was 52 (11.19) years and 66.7% were males, 48.5% belonged to indigenous caste. In regard to education level, 30.3% of the participants had higher secondary or above education and 21.2% were illiterates. About one-fourth of the participants were housewives, 15.2% government employees and 12.1% were farmers. Participants with history of diabetes for 1-5 years were 48.5%, for more than 5 years were 30.3% and for less than 1 year were 21.2%. The present study showed that eighty five percent knew that diabetes is due to high blood sugar, which can be considered having good awareness on diabetes. The knowledge level was quite high, which might be due to information gathered from different sources. The participants were mainly from urban areas, accessible to local daily and also in frequent touch with health personals. A study from Los Angeles county hospital showed poor knowledge of diabetes. A study from Nepal also showed that diabetes knowledge was poor. These contradictory results might be due to difference in assessment technique or difference in study tools used between the studies as they have used the DKQ-24 method, whereas we used simple questionnaire. But few studies from Nepal, South India, Karachi, United Arab Emirates and Kuwait showed almost similar pattern of result. Studies from Andhra Pradesh, Sri Lanka and Malaysia showed satisfactory diabetes knowledge in diabetes patients. Possibly, the comparability of our findings with that of South India might be due to similarity in the socio-demographic, dietary habits and behavioural characteristic of the participants. Further, comparability of health care services in both the regions might also impart almost similar level of knowledge to the diabetic patients. We could not find any significant association of knowledge with gender. Similar studies were reported from Nepal. Studies from Kuwait and Bangladesh also reported almost similar pattern of findings. Few studies showed higher diabetes knowledge among males. We did not find any significant association between duration of diabetes and knowledge. A study from Nepal reported that no significant association of diabetes duration and knowledge. Jasper US et al also reported almost similar result. However, some studies reported higher level of diabetes knowledge with duration of disease. In this study, rice is the major meal (97%) consumed and 17.0% smokers and 36% drink alcohol occasionally. A study from Ethiopia reported that 10% - 20% carbohydrate, 40% - 60% proteins, 20% - 30% fat, small amount vitamins and minerals are advisable food for diabetic patients. It is worthy to mention that rice is the major staple food consumed in this part of the country. A study from Pakistan showed that prevalence of cigarette smoking among type 2 diabetes mellitus patients was 27%. There was significant association of male sex, number of cigarettes smoked in a day, duration of disease and duration of cigarette smoking. In the present study, 57.0% were having HbA1C level < 7.0% and high VLDL among the study participants. The physical activity and its duration, knowledge on diabetes, duration of treatment and BMI did not show any significant association with blood sugar control. But interestingly, the cholesterol level positively correlated to HbA1C level (p= 0.002). Exercise is shown to have significant impact on HbA1C in DM2 patients of group. i.e. walking and yoga respectively. A study from Pakistan showed that HbA1C had non-significant and weak negative association with diabetes-related knowledge. A study from Malaysia reported that 68% patients had HbA1C >6.5% and mean HbA1C was 7.8%. Younger patients had poorer glycaemic control than older patients, and most patients with poor glycaemic control were obese. It was revealed that age (< 60 years), sex (male), duration of diabetes (> 5 years), body mass index (obese), type of treatment (diet therapy vs. combination therapy) and abnormal lipid profile were significantly associated with increased odds of HbA1C > 6.5%. A study from Nigeria showed that RBS increased significantly with increasing BMI status.

CONCLUSION
The control of blood sugar among diabetes patients was fifty seven percent only, in spite of having good knowledge. More than half of participants having some type of physical activities, which may need to improve in terms of hours per day or hours per week. The literacy status and lifestyle habits did not show any significant association with diabetes control among the study population.

Strength and Limitation
We carried out this in hospital setting, accessible mainly by urban population. The blood values were based on their recent laboratory records. We cannot generalise the present study due to small sample size and limited to one hospital only.

Recommendation
We recommend further study involving more subjects including rural and urban population. Health awareness activities may be carried out more vigorously throughout the state to cover all population groups.

ACKNOWLEDGEMENT
We are thankful to all participants without whom this would not have been possible.

REFERENCES

