ORIGINAL ARTICLE

Knowledge Assessment of Diabetic Patients – A Cross Sectional Study

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Abstract :

Two hundred and sixteen diabetic patients were interviewed using a purpose made questionnaire to assess their knowledge on diabetes mellitus (DM). The mean age of the subjects was 47.06 ± 13.28 years, and they were known to have diabetes for 5.74 ± 4.68 years. Family history of DM was found in 44.44% and 87.50% were members of Diabetic Association of Bangladesh (DAB). A considerable number of the patients interviewed were quite unaware about the symptoms of DM (20.37%), prohibited foods (5.55%), restricted foods (13.88%), non-restricted foods (53.70%), ideal body weight (59.72%), relationship between body weight and diabetes control (56.01%), importance of exercise in diabetes control (4.16%) and hypoglycaemia (82.87%). They were equally unaware of the fact that diabetes can affect eye (47.68%), kidney (51.85%), heart (64.81%), brain (93.51%) and skin (leg ulcer) (59.25%). About 81.94% did not know how to control DM. Out of 216 cases, 72.22% attended basic information session in large group once during their enrollment in DAB. The difference in knowledge between the groups who attended the session and those who did not was found to be insignificant with the exception of knowledge about non-restricted food and kidney and heart complications (p=.058, p=.036 and p=.010 respectively). A sub-group of 106 (49.07%) cases were on insulin; among them, 28.30% lacked the skill to inject insulin and 44.33% did not have the knowledge about when and how to change doses of insulin. Among the study group, SMBG was very poor (7.87%). This study found that the knowledge attained by the diabetic patients regarding their disease is not satisfactory and needs further improvement by more effective methods of continuous education.

Introduction:

The epidemic of diabetes mellitus continues with growing public health burden worldwide. The escalating prevalence of diabetes is overtaking infectious diseases as the major cause of morbidity and mortality. Worldwide prevalence of diabetes for all age groups was estimated to be 2.80% in 2000 and would increase to 4.40% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030[1]. Major share of this global burden is projected to occur in the countries of South East Asia Region (SEAR), which are passing through demographic and epidemiological transition. Among them, India, Indonesia and Bangladesh pose the greatest threat. Number of diabetes cases in Bangladesh in 2000 was 3.1 million and is projected to be more than 11.1 million by the year 2030[1]. The rising prevalence is attributable to population

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growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity. Obesity is markedly increasing in areas of rapid adoption of western lifestyle by the population[2].

Uncontrolled diabetes can lead to various microvascular and macrovascular complications causing significant morbidity, reduced quality of life and mortality. The risk of chronic complications increases with the duration of hyperglycaemia[3]. The onset of complications could be reduced or delayed by maintaining strict glycaemic control. Diabetes is largely a self-manageable disease. Patients' knowledge about the various aspects of the disease together with the understanding of the aims and objectives of various treatments has tremendous impact on the patient's self care practices, changes in health behaviour, skills necessary to better control of blood sugar, disease monitoring and adherence to the medications. Inadequate knowledge may inadvertently affect the attitudes and practices towards its care.

Knowledge assessment of diabetic patients in Bangladesh needs further comprehensive work[4]. Assessment of knowledge level can help to ascertain the educational need for diabetic patients in this country and provide directions in planning relevant strategies in improving the knowledge level.

Considering all, a cross-sectional study was undertaken to assess the baseline knowledge of the diabetic patients on their disease.

Materials and method :

This cross-sectional analytical study was conducted during the first week of September 2004 at the outpatient and inpatient departments of Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine & Metabolic Disorders (BIRDEM). A total of 216 patients (Male=100, Female=116) were selected randomly. After verbal consent, the patients were interviewed and their statements were recorded on a purpose made questionnaire by the students of Holy Family Red Crescent Medical College. Data collected included 1) sociodemographic data, diabetic association membership, diabetic education and family history of DM; 2) knowledge about symptoms, suitable diet, ideal body weight, relationship between weight and DM, exercise and DM, hypoglycaemia, various complications and control of DM; and 3) skill for insulin injection, insulin dose adjustment and home glucose monitoring. The responses were either yes or no, or know or do not know. Height and weight of the patients were recorded from the guidebook of Bangladesh Diabetic Association and body mass index (BMI) was calculated by standard formula. Obesity was considered if the BMI was found more than 25 kg/m^2 as suggested by the International Obesity Task Force[5].

The data were entered and processed on the SPSS 12 software. The data were subjected to statistical analysis using the same programme. Continuous variables were described by the frequency distribution, mean, median, standard deviation, and extreme values. Discontinuous variables were described by the documented frequency and frequencies of each modality. In order to assess statistically significant association between knowledge and formal education on DM *Chi-square* test was done.

Results :

A total of 216 patients were interviewed which included 46.29% males and 53.71% females. The mean age was 47.06 (±13.28) years. The females were younger (45.41 ± 13.16 years) than the males (48.98 ± 13.23). Among the subjects 13.43% were less than 30 years old, 20.83% were in age group 31- 40 years, 27.32% in 41- 50 years, 25.46% in 51-60 years, 10.65% in 61-70 years and 2.31% were older than 70 years.

Little less than half (43.98%) of the patients were suffering from diabetes for less than four years, 42.59% for 4-10 years and 13.43% for more than 10 years; 83.80% of the subjects were married, 25.46% completed primary education, and 22.69% were illiterate. Among the female patients, 87.93% were housewives. The mean monthly family income was Tk.11410.12 (±15372.15). The overall demographic features of the survey population are shown in Table-I.

Table-I: Demographic data of the survey population (N=216)

Variable		
Sex	Male	100 (46.29%)
	Female	116 (53.71%)
Age (years) as mean (+SD)		47.06 (±13.28)
Duration(years) as mean (+SD)		5.74 (±4.69)
Anthropometry	Height (cm) as mean (+SD)	1.56 (±.08)
	Weight (kg) as mean (+SD)	56.03 (±10.97)
	BMI (kg/m²) as mean (+SD)	22.92 (±3.86)
Smoking	Current smokers	19 (8.79%)
	Nonsmokers	197 (91.21%)
Marital status	Married	181 (83.80%)
	Unmarried	13 (6.01%)
	Widowed	21 (9.72%)
	Divorced	1 (0.46%)

Variable		
Education level	Illiterate	49 (22.69%)
	Primary	55 (25.46%)
	Secondary	48 (22.22%)
	Higher secondary	26 (12.03%)
	Graduation	19 (8.80%)
	Masters	09 (4.17%)
	Others	10 (4.63%)
Occupation	Service	35 (16.2%)
	Business	33 (15.28%)
	Housewife	102 (47.22%)
	Professionals	08 (3.70%)
	Unemployed	11 (5.10%)
	Retired/ old age	16 (7.41%)
	Students	03 (1.39%)
	Others	08 (3.70%)
Monthly family income	Upto Tk. 1500	17 (7.87%)
	Tk.1501- 5000	76 (35.19%)
	Tk. 5001- 10000	59 (27.31%)
	Tk. 10001- 15000	21 (9.72%)
	Tk. 15001- 20000	24 (11.11%)
	> Tk. 20000	19 (8.80%)

Only 40.27% of the patients knew about BMI and could tell their ideal body weight. BMI of the study population was 22.92 (±3.86), females had slightly higher BMI (23.19 ± 4.22) than the males (22.59 ± 3.88). Of the males 20.00% and the females 34.48% were obese (BMI>25).

Among the subjects, 189 (87.50%) were members of the Diabetic Association and 156 (72.22%) had participated in diabetic education class. More than 44% of the subjects had positive family history of diabetes. Twenty five percent had diabetic fathers, 16.66% diabetic mothers and 14.58% had both parents diabetic. Occurrence of diabetes in a sibling was reported by 13.88% and 4.16% had it in an offspring.

Around 20% cases did not know the symptoms of diabetes and 53.70% about the unrestricted foods. About 82.00% of the study population were unaware about how diabetes could be controlled. The frequency of lack of

knowledge on diabetes in the study group is shown in Table-II.

Table-II: Frequency of lack of knowledge about diabetes mellitus among the study population

| Desired knowledge	Number of patients	Percentage
1. Symptoms of diabetes	44	20.37
2. Food prohibited	12	5.55
3. Food restricted	30	13.88
4. Food un-restricted	116	53.70
5. Body weight and DM	121	56.01
6. Exercise and DM	09	4.16
7. Hypoglycaemia	179	82.87
8. Kidney complication	112	51.85
9. Eye complication	103	47.68
10. Heart complication	140	64.81
11. Brain complication	202	93.51
12. Foot complication	128	59.25
13. How DM can be controlled	177	81.94
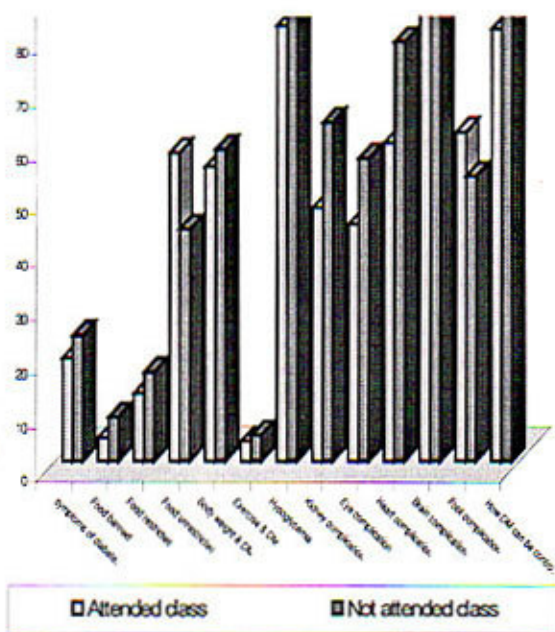
Figure 1: Comparison of lack of knowledge between the subjects who attended the education classes on diabetes and who did not.

Shows the comparison of knowledge status between the patients who received education on diabetes and who did not.

No significant relationship was found between education on diabetes and knowledge on symptoms of diabetes (p=0.503), prohibited food (p=0.269), restricted food (p=0.464), body weight and diabetes (p=0.912), exercise and diabetes (p=0.704), hypoglycemia (p=0.656), eye complications (p=0.101), brain complications (p=0.493), foot complications (p=0.272) and control of diabetes (p=0.344). Knowledge regarding un-restricted food (p=.058), renal (p=0.036) and cardiac complications (p=0.010) of diabetes were significantly higher among patients attending education session on diabetes.

One hundred and three (47.68%) patients tested urine regularly at home. Among them, 62 (60.19%) tested with Benedict's solution while 41 (39.80%) tested with strip. Three quarter (74.75%) of them tested urine correctly. Only 17 (7.87%) of the study population monitored blood glucose at home.

Among the study population, 106 (49.07%) were on insulin, 30 (28.30%) did not have proper skill to inject insulin and 47 (44.33%) did not have idea about when and how to change the dosage of insulin.

Discussion :

The gender differences found in this study population is similar to findings of Saleh et al in Bangladesh[4] and Rafique et al in Pakistan[6]. Globally, it is observed that the overall diabetes prevalence is higher in men, but there are more women with diabetes than men which may be due to the combined effect of a greater number of elderly women than men in most populations and the increasing

prevalence of diabetes with age[1,7]. High prevalence of diabetes (52.78%) in the 41-60 year age group in the study population meant that majority of diabetic subjects was suffering from the disease in their most productive years of life. Similar finding is seen in the developing countries where majority of people with diabetes are in the 45-64 year age range[8] in contrast to the developed countries where majority are older than 64 years[1].

Around two third (72.22%) patients reported taking part in patient educational session at the time of enrollment in DAB. More than 20% of the study population did not know the symptoms of diabetes, 94.45% and 86.12% patients had satisfactory knowledge of prohibited and partially restricted food items respectively, but 53.70% did not know about the unrestricted foods. Role of body weight to the disease was not known to 56.01% of the patients. In contrast, more than eighty percent of the subjects in a study conducted in Singapore understood the importance of diet control and weight control in their condition[9]. More than one third of the subjects did not know the proper nutrition rules in diabetes in a study carried out in Lublin[10]. Only 4.20% of study patients did not have the knowledge about the role of exercise in diabetes.

Knowledge regarding hypoglycaemia was found to be very poor among the patients, only 17.13% had the proper knowledge to identify and to take appropriate measures. Knowledge on diabetic complications was also unsatisfactory in the study group. Only one patient mentioned all the important organs affected by diabetes. More than 93% patients did not know about the neurological complications; 59.25%, 64.81%, 51.85% and 47.68% patients did not have knowledge about

foot, heart, kidney and eye complications respectively. Only 18.06% of the subjects had complete knowledge that diabetes can be controlled by diet, exercise and medications. A study conducted in Aga Khan University Hospital, Karachi found that 53.00% subjects had poor knowledge about the symptoms, treatment and complications of diabetes, while 35.00% had acceptable and 12.00% had good knowledge[6]. The same study also revealed that 18.00% of men and 26.00% of women did not know of a single complication associated with diabetes. A study done by Kamel et al in Egypt also found that majority of diabetic patients (90.00%) had poor knowledge about the disease, 83.70% had poor knowledge about the complications associated with diabetes and 96.30% had poor awareness about how to control the disease[11]. More than 77.00% of the patients in Quetta, Pakistan had no knowledge of diabetes and its complications[12]. None of the patients in a study conducted by Latalski et al was able to enumerate all the organs or systems most frequently affected by complications[10]. Another study done in Pakistan reported 58.00% patients having inadequate knowledge on diabetes[13].

In this study, 47.68% patients tested urine at home, 60.19% and 39.80% tested with Benedict's solution and strip respectively. About three quarter of them knew the correct procedure of testing. Only three out of 60 diabetics in Chandigarh, India practiced self-testing of urine[14]. Only 7.87% of the study population did self-monitoring of blood glucose. This is probably due to the financial constraint as the glucometers available in the market are expensive. Tham et al in their study in Singapore found 21.20% patients to practice home blood glucose self-

monitoring[13]. Only 26.00% patients tested blood sugar at home in New Zealand as revealed in a study by Mitikulena and Smith in Wellington[16]. In contrast, the crude prevalence of subjects with diabetes practicing self monitoring is 75.00% in USA[17]. Almost half of the patients (49.07%) were on insulin. Among them, 71.70% had the skill to inject insulin and 55.70% knew when and how to change the dosage of insulin.

This study found that the current system of imparting education to the patients even in well organized centres does not provide fruitful results, which is essential for the proper management of their condition. A small-group education with patients actively participating in exchange of knowledge together with skill development may give the desired result. Feedback regarding skill development and closer interaction between patients and the service providers will be more effective than traditional knowledge based education.

References :

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes. Estimates for the year 2000 and projections for 2030. Diabetes Care 2004; 27: 1047-53.

2. Wareham NJ. Epidemiology of diabetes. Medicine International (Bangladesh edition), 2002; 2: 11-13.

3. Powers AC. Diabetes mellitus In : E Braunwald, As Fauci, DL Kasper (editors). Harrison's Principles of Internal Medicine, Fifteenth edition. New York : McGraw-Hill Companies, Inc., 2001. pp-2109-37.

4. Saleh S, Akther A, Ahmed KR, et al. Evaluation of knowledge, attitude and practices of Bangladesh type 2 diabetic subjects. Diabetes and Endocrine Journal 2002; 20 (suppl. 1): 31-32.

5. World Health Organization, Regional Office for the Western Pacific, International Association for the study of obesity. International Obesity Task Force. The Asia-Pacific perspective: Redefining obesity and its treatment. Melbourne: Health Communications Australia, 2000.

6. Rafique G, Azam I, White F. Knowledge, Attitude and Practices (KAP) survey of diabetes and its complications in people with diabetes attending a university hospital. Brochure of Diabetes in Middle East, Eastern Mediterranean and South East Asia (DIMEMSEA) Second Conference, 02-04 March, 2000, Dhaka, Bangladesh.

7. King H, Aubert RE, Herman WH. Global burden of diabetes, 1995-2025: prevalence, numerical estimates and projections. Diabetes Care 1998; 21: 1414-31.

8. Raheja BS, Kapur A, Bhoraskar A, et al. Diab Care Asia-India study: diabetes care in India - current status. J Assoc Physicians India 2001; 49: 717-22.

9. Koh KT, Goh LG, Lam SL, et al. Knowledge and concerns of newly diagnosed NIDDM patients in Singapore. Diabetes Res Clin Prac 1991; 12: 11-7.

10. Latalski M, Skorzynska H, Pacian A. The demand for health education among patients with diabetes. Ann Univ Mariae Curie Sklodowska [Med] 2002; 57: 579-88.

11. Kamel NM, Badawy YA, El-Zeiny NA, Merdan IA. Sociodemographic

determinants of management behaviour of diabetic patients. Part II. Diabetics' knowledge of disease and their management behaviour. East Mediterr Health J 1999; 5: 974-83.

12. Ali M, Khalid GH, Pirkani GS. Level of health education in patients with type II diabetes mellitus in Quetta. J Pak Med Assoc 1998; 48: 334-6.

13. Afridi MA, Khan MN. Role of health of health education in the management of diabetes mellitus. J Coll Physicians Surg Pak 2003; 13: 558-61.

14. Kaur K, Singh MM, Kumar, Walia I. Knowledge and self-care practices of diabetics in a resettlement colony of Chandigarh. Indian J Med Sci 1998; 52: 341-7.

15. Tham KY, Ong JJ, Tan DK, How KY. How much do diabetic patients know about diabetes mellitus and its complications? Ann Acad Med Singapore 2004; 33: 503-9.

16. Mitikulena A, Smith RB. Views of Pacific Islands people with noninsulin dependent diabetes; a Wellington survey. N Z Med J 1996; 104: 467-9.

17. Karter AJ, Ferrara A, Darbinianet JA et al. Self-monitoring of blood glucose. Language and financial barriers in a managed care population with diabetes. Diabetes Care 2000; 23: 477-483.