Baseline Disease Knowledge Assesment in Patients with Type 2 Diabetes in a Rural Area of Northwest of Pakistan

Z. U. Hasan (Abaseen Institutde of Medical Sciences (AIMS),)
S. Zia,M. Maracy (Clinical Epidemiology and Biostatistics,)

Abstract

Objective: (1) To assess baseline disease related knowledge in patients with type 2 diabetes about their disease, its risk factors, signs/symptoms, related complications and suitabte diet and (2) Is there an association between gender, duration of disease & age at diagnosis of diabetes and the above dependent variables .
Methods: A 20-item interview-based structured knowledge questionnaire was used to collect information. A total of 82, diabetic patients, mean age 55.2 (11.4 S.D.) years, ranging from 35-80 years, were interviewed.
Results: Statistically significant association was found between age at diagnosis aJ1d better understanding of risk factors, (OR = 1.20, P=0.012 with 95% CI 0.85- 0.98). Statistically significant association was found between gender and better understanding of word "diabetes" or "sugar" OR= 1.15, P=0.051 with 95% Confidence interval 0.96-1.29). Statistically significant associations were found between gender and patients' better understanding of disease signs/symptoms (OR = 1.35, P=0.005 with 95% CI 0.40-0.56). No significant associations were found between gender, duration of diabetes, age at diagnosis and patients' better understanding of disease related .
Conclusion: Priority needs to be given by WHO education programmes for the development of diabetes education program in rural areas to give patients a better knowledge of their disease, to prevent premature morbidity and mortality associated with diabetes (JPMA 54:67;2004).

Introduction

Diabetes mellitus is a metabolic syndrome, (i.e., a collection of disorders of which hyperglycaemia is the hallmark). Several studies have shown that the prevalence of diabetes in white population is moderate as compared to many non-white populations 1-6 generally higher in urban areas than in rural areas and comparatively higher in emigrant populations as to their non-emigrant counterpart. 3 It has been stated that diabetes mellitus is a third world problem, causing a severe strain on the evolving health economy of many third world countries and their health care systems. 7,8 A study conducted by World Health Organisation (WHO) indicated that the number of patients with type 2 diabetes is increasing substantially and may exceed 100 million by the year 2000 if the present trends continue. 9 The estimated worldwide burden of diabetes will be more than 245 and 300 millions, respectively, by year 2010 and 2025. 10 This burden is more in developing countries as approximately 85% diabetic patients live there and suffer from one or more complication of the disease by age 55 years. Recently a study conducted by Shera et al. l1 in rural areas of N. W.F.P, as part of Pakistan National Diabetes Survey by WHO, indicated that the overall prevalence of type 2 diabetes and impaired glucose tolerance (IGT) in both sexes is 11.1% and 9.4%, respectively, and concluded that

diabetes mellitus in rural areas of N. W.F.P. is rising. Diabetes patient education is one of the strategies for enhancing lifestyle changes, usually facilitated by nurse and dietitian diabetes educators. 12 It is suggested that patients with a chronic condition, which requires ongoing monitoring and management, an active patient role may be more appropriate than a passive role. 13 If patients are to adopt an active role they must have knowledge of their condition, its management and related complications in order to make informed decisions. 14 To manage diabetes, individuals must have a good knowledge of their disease, medication, diet, as well as genetic and environmental risk factors and how to modify them according to exercise. One of the reasons why people do not manage their diabetes appropriately may be due to complete or incomplete lack of knowledge and awareness of their disease. Patients' knowledge about diabetes and related complications is currently perceived as an integral part of their management along with their pharmacological treatment. 14 It has been suggested that a low level of knowledge might be assumed to result in poor control. l5-l8 However, studies on diabetes education or knowledge awareness have shown conflicting results. For example, several studies reported that patients' disease related education and knowledge can improve the quality of life and can prevent early onset of complications. 15-l8 A study carried out by Carrard et al. 19 reviewed 74 consecutive diabetic admissions and found 67% of those admission could have been avoided by proper knowledge or education and therefore suggested that a lack of diabetes knowledge or education could be costly in both financial and health terms. Brown 20 concluded, after an extensive literature search and meta-analysis, involving 82 experimental studies concerning the effects of patients' education programmes, that :patient education about their disease did increase patient knowledge and understanding, and that it also had a positive effect on metabolic control. Her findings supported those of Padgett et al. 18 based on meta-analysis of 93 studies, considering the effects of educational interventions in the management of diabetes. In contrast, research has also demonstrated that there is no correlation between increased diabetes knowledge and metabolic control. 21 A review article by Glasgow and Oateon 22 concluded, "the simple model of knowledge transfer is uneducated and inconsistent with observed human behaviour and that diabetes education must move beyond knowledge improvement and metabolic control. This view is supported by educationalists of diabetes such as Dunn et al. 23 However, there were methodological weaknesses in the design of some studies, inconsistencies in the reported research results and interpretation of the results was confounded by studies using widely differing educational interventions, target population and outcome measures. Therefore, it must be recognised that this is considered an extremely difficult field of investigation 20 and it may not be feasible to solve all methodological problem in order to conduct the ideal study. Diabetes education programs are still rare or even non-existing in certain parts of the world. There are a number of reasons of which economical and illiteracy are the top ones. Therefore such areas need not only training of health professional and workers but will require such health education programs which can train any individual from a community in their own language who in turn can educate and transfer such knowledge to the rest of the community specially in rural settings. Previously Ali et al. 24 had suggested that patients with diabetes need both pharmacological therapy as well as more emphasis has to be given to their health/disease education.

Subjects and Methods

North West Frontier Province (N.W.F.P.) is located in the northwest of Pakistan, where the borders meet with Afghanistan and China in the north. Peshawar is the capital of N.W.F.P. having a population of 14 million according to census in 1998 and adds up to approximately 18 million after inclusion of the tribal areas and Afghan refugees, of mixed socio-economic status. Ninety-nine percent of the population is Muslim. Literacy rate is about 20%. There are four teaching hospitals in the province and seven medical schools (4 public funded and 3 private). There are approximately 10,000 hospital beds in the province. Sarbund is a rural village situated 12 miles towards the West of Peshawar having a total population of 20,000, who are permanent local residents. The majority of people in rural areas live with extended families in a household and farming is the main occupation and source of income. A team was formed, by the local and UK based Pakistani doctors to conduct a cross-sectional survey in a rural area (Sarbund) of N. W.F.P. to assess baseline knowledge level of people with diabetes regarding their metabolic disorder. A team of 25-members consisted of 15 health care professionals (2 consultant physicians, an epidemiologist, 4 doctors, 5 nurses and 3 fourth year medical students), 7 social workers and 3 community link- workers, organized by AIMS Peshawar. After an extensive literature search it was decided to adopt a questionnaire that was specific to diabetes, had been previous1y piloted and rigorously tested for validity and reliability and had a very high reproducibility rate within the South Asian population. A 20-item interview-based structured-questionnaire was adopted from the questionnaires used by Dunn and Fenando. 25,26 The questionnaire was slightly modified according to the need (for example food habits like use of roti rather than bread) of this particular population. Current validity of the questionnaire was assessed by the health professionals and then piloted on 15 people with type 2 diabetes attending an out-patient medical clinic at a local teaching Hospital. The pilot study indicated that people with diabetes could understand the questions and that it appeared appropriate for this investigation. After the study protocol and questionnaire approval by the local ethics committee, the team members visited the village to meet the leaders of the different community or families (Malaks) to explain the purpose and outcome measures of the study and to encourage their participation. 2. Study population selection / inclusion criteria People with type 2 diabetes, aged 35 years or more, formed the target population for this study from which a consecutive sample of 82 persons with type 2 diabetes were selected as study population. The inclusion criteria for the study was as following: 1. People with a confirmed diagnosis (diagnosis of diabetes had previously been made by a physician or who had their blood test reports or who were on anti diabetic medication) of type 2 diabetes for at least 2 or >2 years duration. 2. Local residents were included. The exclusion criteria for the study was as following;

1. Self -diagnosis of diabetes.
2. Type 1 diabetics.
3. Emigrant (Afghani) subjects.
4. Patients with any mental illness.

3. Statistical Methods The data were analysed and the summary statistics were carried out by the statistical packages, SPSS for Windows, version 10.1 and STATA for Windows, version 6 was used for Logistic regression model. The results for all continuous variables

are given in the form of averages (S.D.). The main aim of the analysis was to look at the relationships between different co-variates and diabetic's knowledge of disease and to fit a Logistic regression model. Subjects' knowledge was the dependent variable and genetic and environmental risk factors, understanding of the word "sugar", sign/symptoms associated with diabetes; its complications and suitable diet were the co-variates (including baseline variables gender, duration of diabetes, and age at diagnosis). The data was analysed using STATA version 6, with the data set using the command 'logit'. Subjects' responses were categorised into "Yes" and "No" (when the response was 'no' or 'don't know'. The Odds Ratio (OR) gives the ratio of the Odds, relative to the baseline. An OR of greater than 1.00 indicated that a variable (or category within a variable) is associated with better understanding of the disease and vice versa for a OR of less than 1.00. The width of the 95% C1 was an indication of the precision of the OR estimate. A probability value of less than 0.05 was considered significant.

Results

Basic Characteristics A total of 82 diabetic subjects were interviewed, comprising 25 (30.5%) males and 57 (69.5%) females, with a mean age of 55.2 (11.5 S.D.) years ranging from 35-80 years. The overall attendance rate for male and female was 20% and 80%, respectively. The mean age at diagnosis was 46.8 (7.9 S.D.) years ranging from 30-64 years, around 90% had duration of diabetes between 5- 7years. Twenty-one (26%) and 2 (2.4%) subjects had been regularly examined for their eyes and foot complications, respectively, while 43 (52.4%) and 23 (28%) had been regularly examined for their blood pressure and blood test, respectively. Twenty- seven individuals (33%) had a positive family history of type 2 diabetes, including 9 with an affected sibling, 3 with affected children, 2 with affected parents and 13 with multiple affected family members. Twenty-two (26.8%) diabetics visited their doctor once every month, 18 (22%) once in three months, 13 (15.8%) once in a year while 29 (35.4%) did not see their doctor after their initial diagnosis. Twenty-nine (35%) subjects believed that diabetes was a completely curable disease, once the medication was used, 39 (48%) thought that diabetes in not curable while 14 (17%) did not have any knowledge of its cure. Thirty-three (40.5%} individuals were on oral anti-hypoglycaemic agents, 42 (51%) were on diet and exercise while only 7 (8.5%) were on insulin injections. Forty-one (50%) and 36 (43%) diabetics believed that a nurse has either no role or no knowledge of a role in the management of a diabetic person, respectively. [(0)] Genetic and Environmental Risk Factors Knowledge of genetic and environmental risk factors for type 2 diabetes is shown in Figure I. Twenty- seven (33%), 7 (8.5%) and 17 (21 %) subjects were aware that positive family history, lack of exercise and obesity, respectively, increased the risk of developing type 2 diabetes. When knowledge of risk factors for type 2 diabetes was used to fit in the model with the baseline variables, a probability of 0.046 Chi Square was observed. Diagnosis at younger age was significantly associated with better understanding of diabetes' associated risk factors (P = 0.014; OR, 0.92; 95% CI, 0.85-0.98). Gender and duration of diabetes were not associated with better understanding of the disease risk factors (P = NS, Table 2).

[(1)] What is diabetes (Sugar) Subjects' knowledge and better understanding of the word diabetes (sugar) is shown in Figure 2. Twenty-three (28%) and 22 (27%) diabetics stated

that diabetes is a disease related to stress and worries (tension) and it's a disease of muscle weakness and general tiredness, respectively. Twelve (15%) and 1 (1.2%) were aware that diabetes is the disease associated with too much urine production and with a structure called 'pancreas' in the body, respectively, whereas only 1 (1.2%) and 4 (4.9%) patients stated that diabetes is associated with too much sugar in blood and too much sugar in urine, respectively. None of the patients had any knowledge of the word 'insulin' and its association with diabetes. When knowledge and better understanding of the word diabetes was used to fit in the model with the baseline variables,a probability of 0.045 Chi Square was observed. Among patients studied, a higher proportion of males (approaching to significant level) had better understanding of diabetes as compared to females (P = 0.051; OR, 0.10; 95% CI, 0.01-1.01). Age at diagnosis and duration of diabetes were not associated with better understanding of diabetes (P = NS, Table 2).
[(2)] Signs and Symptoms Diabetics' knowledge of signs/symptoms of untreated diabetes is shown in Figure 3. Fifty-two (63%),48 (59%) and 17 (21%) people stated that diabetes is characterised by too much urine, too much thirst and weight fluctuation, respectively. A probability of 0.013 Chi Square was observed when knowledge of signs/symptoms of untreated diabetes was used to fit in the model with the baseline variables. Among the subjects studied, a significantly high proportion of males had better understanding of disease-associated signs/symptoms than females (P = 0.005; OR of 0.15; 95% C1, 0.04-0.57). Age at diagnosis and duration of diabetes were not associated with better knowledge of the disease related signs/symptoms (P = NS, Table 2).
Complications
Subjects' knowledge of the complications associated [(3)] with type 2 diabetes is shown in Figure 4. Thirty-three (40%),21 (26%) and 20 (24%) diabetics were aware that diabetes in long term could affect kidneys, eyes and nerves, respectively, but only 4 (4.9%) and 2 (2.4%) diabetics were aware of effects of diabetes on cardiovascular system and feet/sexual organs. A probability of 0.751 Chi Square was observed for the model, when knowledge of complications associated with type 2 diabetes was used to fit in the model with the baseline variables. Gender, age at diagnosis and duration of diabetes were not associated with better understanding of diabetes related complications on different organs (P = NS, Table 2).
Suitable Diet
Awareness of the suitable diet for type 2 diabetes is shown in Figure 5. Twenty-eight (34%),60 (73%) diabetics were aware that meat products (chicken, lamb, beef) and vegetables/fruit, respectively, are suitable for diabetics. Forty-three (52%) diabetics were aware that honey and all other sweet dishes, are not suitable for them while only 4
Figure 5 Diabetics' response to dietary factors suitable in diabetes (4.9%) were aware that all kinds of fried food is not suitable for diabetics, A probability of 0,137 Chi Square was observed, when knowledge of the suitable diet in type 2 diabetes was used to fit in the model with the baseline variables. Gender, age at diagnosis and duration of diabetes were not associated with better knowledge/understanding of suitable diet in diabetes (P = NS, Table 2).
Figure 6 illustrates a list of reasons or causes that diabetics perceive as problems in managing their disorderSixty-two (76%) and 49 (60%) subjects reported that lack of knowledge/awareness and economy. respectively, are the two main problems in managing their diabetes. Nineteen (23%) and 17 (21%) believed that lack of service availabity in the area and inability to read and write are the problems for managing their

disease. While 6 (7%) and 7 (8.5%) agreed that lack of time and cultural/ social/ religious are the main factors in managing their diabetes, respectively. [(5)]

Discussion

The overall attendance rate for male and female subjects was 20% and 80%, respectively. A lower rate of attendance seen in males was due to inability to leave their work even on a national holiday (Sunday) as majority of the people do farming in rural areas. The majority of subjects responded "no" or "don't know" to different, questions that would not be expected in a normal distribution of results. This may indicate that the sample had below average knowledge of diabetes or perhaps the questionnaire was too vigorous. The lower "yes" response may reflect the lesser emphasis that had been given to diabetes education in that part of the world. This aspect of care is not given priority in health service. One interpretation of these results would be that they are a reflection of the education/ knowledge; patients have about their diabetes. The results of this investigation may not be explained by the sample involving only older subjects as their age ranged from 35-80 years, with 50% (41) of age = 50 years and 50% (41) >50 years. In several studies it has been noted that age correlated negatively with knowledge level and that younger people are more knowledgeable than the older sample members. 21,24 No associations were found between age and dependent variables, except our results indicated that diabetics' age at diagnosis (younger) was associated with better understanding (P = 0.014) of diabetes' associated risk factors as compared to older subjects. Alternative explanation of such results include that the questionnaire was too demanding or sensitive to enable diabetics' knowledge of their condition. All the questions were of a standard that anyone with type 2 diabetes would be expected to answer. At the time of this study the questionnaire was considered the most appropriate instrument to use and additionally, was piloted successfully in diabetes patients at the out-door patient clinic in a Teaching hospital, Peshawar. The results of this study indicated that respondents were less knowledgeable about their diabetes. Additionally our results suggested that male diabetics had comparatively better understanding of word 'diabetes' and its associated signs/symptoms (P = 0.051 and 0.005, respectively) than females, with wider 95% CIs (0.96-1.29 and 0.04-0.58, respectively) which could be due to small sample size. Such a difference could be explained by a very low literacy rate in females, as well as cultural, social and religious issues and lack of service availability in rural areas. Such know ledge should help them to engage in a partnership with their health professionals based upon manual participation in their diabetic management. 12 It is generally accepted that a reasonable level of knowledge is essential if people with diabetes are to be able to manage their condition. 27 Many studies relied upon blood glucose level as an index of physiological control in order to evaluate diabetics' knowledge of their disease or the effects of training programmes. Recently educators have suggested that quality of life and satisfaction should be included in outcome criteria. 22 Our results are in agreement with Ali et al.24 that people with diabetes have very poor level of knowledge regarding their disease, risk factors, signs/symptoms and associated complications. We need to individualise patient education and stress on the importance of training the patient as a "person" first and then a "diabetic". There are witnessed changes appeared in teaching and training methods in diabetes care in the western world during

the past decade but such teaching and training programmes are still far away in developing countries. Generally nurse education has tended to focus on the care of the patient in hospital, who had an acute physical illness. Similarly diabetic care for diabetics with a physiological disorder has been well taught. However the person with diabetes needs appropriate competencies and attitude to manage their condition themselves over a long period of time in order to maintain his or her blood glucose within normal limits and prevents the development of complications. 28 The skills required by the diabetes nurse or other health professionals to be able to work effectively and efficiently with diabetic people in order to pass on these attributes, have been less taught in their training. Skills in changing attitude, motivating decision making and empowering are required in health professionals as well as the ability to impart information.

Conclusion

In conclusion we need a greater public access to health care professionals and access to media including print, television and Internet for diabetes education dissemination. More literature should be available in local languages. More of the diabetes care has to be incorporated into primary care settings to reduce the human and economic costs of diabetes. We need improved and advanced educational and training programmes for not only health care professionals like Doctors, nurses and lady health visitors but need education and training of local people from the local community who can deliver diabetes care in their local setting more effectively. We need more uniform and broad attitude or policy towards diabetes care that could be applicable for local needs and culture. We need increased time to spend at undergraduate medical and nursing schools training in relation to diabetes care and its delivery system. Increased access to cheap and non-invasive glucose monitoring devices are also required. On the basis of this study results, a diabetic clinic has been started in one of the main teaching hospital (Khyber Teaching hospital) for diabetics in the catchment area.

Summary

In summary this study showed, that patients with type2 diabetes need to be made more aware of their disease, risk factors, signs/ symptoms, suitable diet (specially fried food avoidance) and related complications (specially Cardiovascular). Cardiovascular disease is a major cause of premature morbidity and mortality in people with diabetes in the developing world. Active listening is important in therapeutic patient education. For effective communication we need more education related interventional studies to gather initial baseline information, a systemic community based, group educational training programs and a continuous check on updates of such programs. This study has raised the need for further studies with larger sample group to investigate the link between the level of patient' knowledge and perception of their condition and how this effect appropriate glycaemia control, diabetes related complications, patient's quality of life and patient's satisfaction.

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