How well do Pakistani patients and physicians adhere to standards of diabetes care?

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BACKGROUND: Diabetes mellitus (DM) is a chronic disease, associated with high rates of morbidity and mortality in the developing world. Recent advances in management of DM may improve outcomes, but this is dependent on patient awareness and compliance with the management based on recommended standards of care. This study was designed to evaluate the current status of patient and physician adherence to the standards of care in diabetes management in Pakistan. **MATERIALS AND METHODS:** Interview and examination of one hundred patients admitted to a tertiary care hospital in Karachi, Pakistan was undertaken to determine attitudes, perception and education about DM in the patients and their care providers. **RESULTS:** In this study group of 100 patients, 96 had type 2 DM with 63 on oral hypoglycemic agents, 13 on diet alone, 14 on insulin alone and 10 on combination of insulin and oral agents. Complications included autonomic neuropathy in 49%, systemic hypertension in 46%, ischemic heart disease in 28%, impotence in 43% of males and feet complications in 14%. Thirty-one patients were monitoring their blood glucose at home with only 16 monitoring more than once weekly. Only 34 patients undertook any physical exercise with 19 doing regular exercise for the prescribed period and 33 followed the diet prescribed to them. Fifty-nine patients did not have a detailed foot exam in the past 2 years. Only half (49%) received any type of diabetes education. HbA_{1c} was measured in 65, lipid profile in 55 and urine for microalbuminuria in only 18 patients over the preceding year. Blood pressure was at recommended levels in 38 patients while LDL cholesterol was above recommended levels in 50% patients in whom measurements were made. Only 11% achieved the combined recommended goals of lipid, blood pressure and glycemic control. **CONCLUSION:** Adequate awareness and education about diabetes are lacking and rates of achieving goals in diabetic patients remains low in Pakistan despite increasing diabetes related complications. Improved physician and patient adherence to standards of care would be required to achieve improved outcomes of diabetes care in Pakistan.

KEY WORDS: Adherence, diabetes, standards

Introduction

Diabetes mellitus (DM) is a major healthcare problem with significant morbidity and mortality worldwide. The prevalence of DM in Pakistan is reported as high as 10% among adults with an equal number of people are suffering from glucose intolerance.[1,2] According to WHO estimates, Pakistan is currently eighth in the prevalence of DM and will become fourth by the year 2025 with over 15 million individuals.[3] Standards of care for diabetes management have been published by various associations to optimize levels of care. Patient education remains the cornerstone of any successful treatment strategy of diabetic patients. The success of long-term maintenance of pharmacological therapy and monitoring depends largely upon patient understanding and adherence to a therapeutic plan[4] drawn up by their physicians. Hence, knowledge and adherence of standards of care by physicians is vital in successful patient outcomes especially in our setting where patient self-education about their disease is low.

Chronic complications of DM affect cardiovascular, cerebrovascular, renal, nervous systems along with the foot and eye and place huge burdens on individual patients, their families and the community at large.

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Ideally, education and knowledge about the disease should be imparted to all the patients who in turn, should be active participants in their management. This is the best method to improve outcomes and reduce the chronic complications. Patient education about the disease should commence at the time of diagnosis of diabetes if not even earlier in families where one or more members have the condition. Regular and frequent interaction between the patient and the caregiver are required to accomplish these goals. Diabetes education, with consequent improvements in knowledge, attitudes and skills, leads to better control of the disease and is widely accepted to be an integral part of comprehensive diabetes care.[5-7]

Generally, in Pakistan there is lack of qualified and trained diabetes educators or structured diabetes education programs and facilities, while physicians are too busy to spend significant time to impart this knowledge. Self-learning from authentic scientific sources is rarely done, but patients gather information from old myths and concepts handed down from generation-to-generation. Often compliance with prescribed therapy is low and alternate therapies and "quick fix" solutions are very popular. In addition, the care providers are in many cases not updated in current management and goal or too busy to implement these. The aim of this study was to determine the adherence to the standards of care by patients and their healthcare providers.

Materials and Methods

This was a descriptive study, conducted on one hundred patients with DM, who were admitted to the Aga Khan University Hospital for non diabetes related issues. They were randomly selected and interviewed during their hospital course through a questionnaire that included information on demographics and questions on knowledge, care provided and adherence to therapy pertaining to DM. Inquiry was also made regarding the attitude, awareness and education about the disease. Frequency of blood sugar monitoring, dietary compliance, non prescribed treatments, self-medication, exercise and smoking habits were noted. Knowledge of chronic complications was evaluated. Patients' lab test reports and medical records were reviewed for biochemical profile.

Institutional review board approval was obtained for study protocols before data collection. An informed consent was obtained from all patients who filled the questionnaire. Consenting patients between the ages 14 and 80 years were included. Data were entered and analyzed using SPSS version 11.0. Descriptive statistics were computed for data presentation. Demographic results were descriptive in terms of age, sex, length of time since diagnosis, medications used and the presence of concurrent medical history.

Results

A total of 100 patients (54 males and 46 females) were interviewed [Tables 1 and 2]. Mean age was 53 ± 13.9 years with the majority (58%) between 30 and 60 years. Four percent had type 1 DM and the rest had type 2 DM. Mean duration of the disease was 10.7 years (range 2-28 years). Fifty-three percent had a positive family history for DM in a first-degree relative. Thirteen patients had received primary education, 24 secondary-level education and 25 had achieved higher-level education, while 38 had no formal education. Among the females, 93% were housewives, in contrast, 53.7% of men were employed and 44.4% retired. Mean body mass index (BMI) among males was 24.9 ± 5 kg / m^2 and in females was 26.1 ± 7.3 kg / m^2. Twenty-six percent patients were obese (BMI > 30 kg / m^2) and another 26% of the patients were overweight (BMI 25-30 kg / m^2). Therapeutic management in this group, included use of insulin alone by 14% oral hypoglycemic agents by 63% and combined therapy (insulin and oral hypoglycemic agents) by 10% of the patients. Thirteen subjects were controlled by diet alone.

Table 1: Physician directed and diabetic team care

	Patients			
	Males (54)	Females (46)	Total	(%)
Treatment groups				
Diet	4	9	11	11
Oral antidiabetic drugs	39	22	61	61
Insulin	6	8	14	14
Combination therapy	4	6	10	10
Exercise recommended	39	30	69	69
Detailed foot exam	23	18	41	41
Diabetes education				
Verbal	22	16	38	38
Written	4	7	11	11
Dietician counseling				
Verbal	11	6	17	17
Written	5	8	13	13
Physician's education				
Verbal	39	29	68	68
Written	8	12	20	20
Fundoscopic exam (past 2 years)	42	30	72	72

Table 2: Patient directed care

	Males	Females	Total	(%)
Blood glucose monitoring				
Home	15	16	31	31
Laboratory	33	20	53	53
None	6	10	16	16
Frequency of monitoring				
Daily	1	6	7	7
2-7 times per week	5	4	9	9
Once a week	10	6	16	16
Once a month	32	14	46	46
Diet control				
Regular	17	16	33	33
Sometimes	27	18	45	45
Never	10	12	22	22
Exercise				
20 m/5 pw	16	3	19	19
>1 time per week	3	2	5	5
<1 time per week	3	5	8	8
None	32	36	68	68
Current smoker	12	0	12	12
Ex-smoker	37	1	38	38
Diabetes identification card	0	0	0	0

A diagnosis of hypertension (documented BP > 140/90 mmHg or on antihypertensive treatment)) was recorded for 46% patients. Symptomatic neuropathy (defined as pain, numbness or paraesthesia) was identified in 49% and ischemic heart disease (IHD) (defined as typical history of angina or documented IHD in records) in 28%. Impotence was reported by 43% of males. Nephropathy (as defined by documented proteinuria on two occasions) was noted in 14% and foot problems (ulcer, deformity or amputation) were seen in 14%. HbA_{1c} was measured in 65% of cases in the past 1 year. Serum lipids were assessed in 55% of patients. Urine for microalbumin was recorded in 18% of patients. The mean fasting blood glucose was 198 ± 77 mg/dl, mean random blood glucose was 260 ± 138 mg/dl. The mean HbA_{1c} was 7.0 ± 1.6% at the time of presentation.

Mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) were 139 ± 20 and 80 ± 11 mmHg, respectively. On the basis of American Diabetes Association (ADA) recommendations,[16] blood pressure goal of 130/80, 38% of the patients had SBP in desired range, 69% had DBP in desired range and only 27% had both. The mean total cholesterol level was 170 ± 45 mg/dl, mean LDL-C was 105 ± 30 mg/dl and mean HDL-c was 38 ± 18 g/dl in the 55 patients with lipid profiles. Twenty-nine percent of those tested had the ADA recommended LDL-C values of <100 mg/dl. Forty percent had LDL-c values ≥130 g/dl. Only 11 patients of the total sample of 100 (11%) met the recommended ADA treatment values of HbA_{1c} level <7%, a blood pressure <130/80 mmHg and an LDL-C level <100 mg/dl.

Patients were asked if they received some form of diabetes education during their clinic visits. This was then noted as verbal, if no accompanying literature or printed information of diabetes was given to patient and was noted as written, when the verbal instructions were also accompanied by relevant literature. Only 11 patients received accompanying literature on diabetes, while 38 patients reported having received some verbal education and 51 patients reported no diabetes education at any clinic visits. Sixty-six percent of were unaware of optimal glycemic values. Patients were questioned whether they had a dilated eye exam in the previous 24 months. Seventy-two had their eyes checked for diabetic retinopathy in this period. Only 41 patients had a complete foot exam at least once in the preceding 2 years. HbA_{1c} was measured in 65 patients at least once in the past 1 year. Fasting serum lipids was assessed in 55 patients in this period. Urine for microalbumin was recorded in only 18 patients. None of the patients had a diabetes identification card. Twelve patients (all males) were current regular smokers. Only 19% were exercising at the recommended frequency weekly and 68% admitted to no regular exercise at all. Sixteen percent were monitoring their blood glucose values more than once weekly and less than a third did any home monitoring. Twenty-two percent admitted that they did not follow any dietary advice, while 45 stated that they intermittently adhered to diet and 33 were maintaining diet restrictions prescribed or considered necessary.

Discussion

This study provides preliminary but important information about the standards of diabetes care in Pakistan, a country which is already facing steep increase in diabetes prevalence and complications. Improving quality of life for persons with diabetes and reducing morbidity and mortality are major health-care challenges for providers and governments in developing countries. The ultimate goals of having people with diabetes having near normal life expectancy and minimal or no complications[8] will depend upon the individual compliance with lifestyle modification guided by their physician and adherence to internationally acceptable standards of care and therapy.[9] There is little

information available in the peer-reviewed literature on achieving diabetes goal from this region where achieving good patient compliance is very challenging. Education, which is the cornerstone in diabetes control and management,[8] is inadequately performed due to the lack of trained diabetes educators resulting in few patients receiving comprehensive diabetes education or dietary consoling.

In this study, the patient sample was drawn from in-patients of a tertiary care center in a metropolitan city of the country, where it may be expected that patients have access to higher standards of care than the rest of the country, but many of the patients were living outside the city and had attended community physicians and clinics in their areas for prior diabetes care. The relatively small sample size is a limitation to generalize our results to the community, but nevertheless we feel that important information is gathered from this subset, which is fairly typical regarding the type of patients we come across.

The minority of diabetic patients monitor their blood glucose at home adequately or comply with a diet, both important for achieving good glycemic control,[10-12] which in turn correlates with complication rates.[13] Ulceration and amputation of the lower extremities are among the most serious complications of diabetes,[14] thus foot care is an integral element in diabetes care,[15] but the majority of our patients were not examining their feet and insufficient attention to foot care was being undertaken. Laboratory assessments of renal, glycemic and lipid parameters also were insufficiently done and many did not have these tested once in the preceding 2 years falling well short of recommended standards.[16] Only a small proportion of the patients are achieving target goals of blood pressure, lipid and glycemic control. Adequate awareness and education about diabetes are lacking and rates of achieving goals in diabetic patient's remains low in this country despite increasing diabetes related complications. Improved physician and patient adherence to standards of care would be required to achieve improved outcomes of diabetes care in Pakistan.

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