Blood sugar control, ophthalmology referral and creatinine level among adult diabetic patients in Primary Health Care, Riyadh, Saudi Arabia

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ABSTRACT

Objectives: The objectives of the study were to review the blood sugar levels, duration of illness, referral to the Eye Clinic for Ophthalmology assessment, and basic renal function by creatinine level among adult diabetic patients in primary health care in Riyadh, Kingdom of Saudi Arabia.

Methods: A retrospective study of medical records for diabetic adult patients at different age groups, of both sex, in 6 primary health care centers in Riyadh, Kingdom of Saudi Arabia was carried out during the period from August 2000 to April 2001.

Results: The results of this study show that the duration of diabetes were less than 10 years among 67% of diabetic adult patients, and fasting blood sugar levels were more than 10 mmol/L among 49.2% of diabetic adult patients. Glycosylated hemoglobin were recorded in 0.4% of medical records which, might be due to lack of accessibility for this laboratory test in the selected primary health care centers. Thirty point seven percent of diabetic patients were referred to ophthalmologist, and 74% of diabetic patients had creatinine level ≤150 mmol/L.

Conclusions: Improving the blood sugar control and shared care with ophthalmologists are important steps to improving the quality of diabetic care in primary health care.

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Diabetes mellitus is a health problem in the adult population of the Kingdom of Saudi Arabia (KSA); it has been shown that the prevalence of diabetes is constantly on the rise.[1] The prevalence of diabetes mellitus among adults in KSA is 12-16%.[2,3] Patient with longstanding diabetes may develop complications affecting the eyes, kidneys, nerves or major arteries. Prevention of diabetic complications, together with retardation of their progression is possible, chiefly by tight control of blood sugar level together with reduction of other risk factors, even when the complications are established, their progression to cause serious damage can be either delayed or avoided.[4] Diabetes is a leading cause of, blindness, renal failure, and foot and leg amputations in adults, managed care and budgeted resources challenge clinicians to provide comprehensive health care to patients with diabetes.[5] Improving the quality of care delivered to diabetics in the primary health care (PHC) setting is an important objective in the management of diabetic patient's.[6] The objectives of this retrospective study were to review the blood

sugar levels, duration of illness, referral to eye clinic for assessment of diabetic retinopathy, and basic renal function by creatinine level among adult diabetic patients in PHC in Riyadh, KSA.

Methods. A retrospective review of the medical records of diabetic adult patients at different age groups of both sex in 6 primary health care centers (PHCC) from 3 different region sectors in Riyadh, KSA during the period from August 2000 to April 2001. The data was collected by review of the medical records by the nurse working in the mini clinic for chronic disease in PHCC under the supervision of the primary care physicians in the selected PHCC.

Results. A total of 1236 diabetic adult patients attending the PHCC were included in this study (57.5% men, 42.5% women), the duration of diabetes since diagnosis were less than 10 years among 67% of diabetic adult patients, fasting blood sugar levels were more than 10 mmol/L among 49.2% of patients, and 7.9% had no available fasting blood glucose result in their files even though they are attending for their diabetes; 24.7% did not have the creatinine measured in their files and 62.1% were not referred to an ophthalmologist. The distribution of age, duration of diabetes mellitus, fasting blood sugar, glycosylated hemoglobin (HBA1c), ophthalmology referral, and creatinine level are shown in **Tables 1, 2 & 3**.

Discussion. Diabetes is a risk factor for coronary heart disease and complications of diabetes mellitus have devastating effects on the patient life and a lot of constrains on the health service budget,[7] there is a need for a comprehensive management program at primary health care level for early detection risk factors to prevent and minimize the complications.[3,7,8,9] The results of this study shows that the duration of diabetes mellitus among diabetic adult patients attending primary health care centers were less than 10 years (67% of patients). It also shows that 49.2% of diabetic patients had fasting blood sugar more than 10 mmol/L during the last 12 month, 7.9% had no available fasting blood glucose test even though they attending for their diabetes, the quality assurance in primary health care manual consider fasting blood sugar more than 10 mmol/L as poor control.[6] Glycosylated hemoglobin is a good indicator for the level of glycemic control among diabetic patients.[4-6] The results of this study show that HBA1c was recorded in 5 (0.4%) of diabetic medical records, this might be as the selected primary health care centers lack accessibility for this test, or it might not have been recorded in the patients file. Proper utilization of laboratory facilities between PHCC and nearest hospitals will be an important aspect in

Table 1 - The distribution of sex, age group, duration of disease, latest fasting blood sugar during the last 12 months, and availability of glycosylated hemoglobin (HBA1c) result in medical records among diabetic adult patients in primary health care centers.

Character	Frequency	(%)
Sex		
Male	710	(57.4)
Female	526	(42.5)
Age Group (Years)		
15-<30	22	(1.8)
30-39	125	(10.1)
40-49	314	(25.4)
50-59	358	(29)
≥60	375	(30.3)
Unknown*	42	(3.4)
Duration of diabetes mellitus (years)		
<10	828	(67)
10-19	262	(21.2)
≥20	19	(1.5)
Unknown*	127	(10.3)
Fasting blood sugar (mmol/L)		
<7	173	(14)
7-10	357	(28.9)
>10	608	(49.2)
Unknown*	98	(7.9)
Availability of HBA1c results in medical records		
Available	5	(0.4)
Unavailable	1231	(99.6)
Total	**1236**	**(100)**
* Unknown: data was not available in the medical records		

Table 2 - The distribution of referral to ophthalmologists among diabetic patients in primary health care centers.

Refer to ophthalmologist	Frequency	(%)
Referred	380	(30.7)
Not referred	767	(62.1)
Unknown*	89	(7.2)
Total	**1236**	**(100)**
* Unknown: data was not available in the medical records		

Table 3 - The distribution of creatinine level during the last 12 months among diabetic patients in primary health care centers.

Creatinine level micro mol/L	Frequency	(%)
≤150	915	(74)
>150	16	(1.3)
Unknown*	305	(24.7)
Total	**1236**	**(100)**
* Unknown: data was not available in the medical records		

proper organization and coordination of health services.[10] Improving the knowledge and skills of PHC physicians in the management of diabetes is an important tool towards improving the quality of care. In addition improving the diabetic patients compliance to diet, treatment, follow-up at PHCC is an important aspect in improving the quality of diabetic care,[11] also improving self-management among chronic disease patients, to take shared responsibility for their illness is an important step towards improving the health status of diabetic patients.[12]

Diabetes is a costly condition by virtue of its high prevalence and high per person costs, large proportions of these costs are related to treating complications of diabetes.[13] Prevention and retardation of progression of diabetic complications for example retinopathy, nephropathy, and neuropathy might be achieved by good diabetic control.[4,14,15] The results of this study show that 30.7% of diabetic patients were referred to ophthalmologist for annual assessment for diabetic retinopathy. The quality assurance in primary health care Manual consider the referral to the ophthalmologist at the time of diagnosis and on later annual visits for type 2 diabetic patients, and in case of type 1 diabetic patients, the annual referral to the ophthalmologist starts 5 year after the diagnosis.[6]

The results of this study shows that the distribution of creatinine level during the last 12 months among diabetic patients were ≤150 mmol/L (74%) and >150 micro mol/L (1.3%), this results need further assessments namely 24 hour urine collection for protein which, might be consider in further studies for early detection of diabetic nephropathy among diabetic patients. One of the limitations of this study is the small sample size to come up with the conclusions regarding diabetic patients in PHCC in Riyadh, KSA. It is difficult to elaborate with regards to different reasons for those patients with poor diabetic control due to the nature of the study and it might be interesting to study in the future research those with uncontrolled diabetes in more detail, and did they refer to secondary care, or a hospital diabetic clinic. Concluding which type of diabetes have the poorest control.

Finally, improving the quality of diabetic care at PHC level is an important aspect in the management of diabetes mellitus.

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