Availability of resources of diabetic care in primary health care settings in Aseer region, Saudi Arabia

Yahia M. Al-Khaldi, MBBS, ABFM, Abdullah I. Al-Sharif, MBBS, FFCM.

ABSTRACT

Objective: The objective of this study is to evaluate the availability of resources of diabetes care in primary health care settings in Aseer region, Southwest, Kingdom of Saudi Arabia.

Methods: This study was conducted during September 2001 by distributing a questionnaire to all technical directors of primary health care centers (PHCCs) in Aseer region. The questionnaire, designed by the authors, contained 6 sections that dealt with the necessary structures of diabetic care in the region in addition to the data base of PHCC such as served population, distance from the hospital, and total working physicians and nurses at the PHCC. The data from the questionnaire was entered and analyzed using Statistical Package for Social Sciences.

Results: Two hundred and forty-two PHCC technical directors responded to the questionnaire. Total served population by PHCC was 970,306 individuals. Total working physicians were 391 and nurses were 902. Diabetics represented 2.7% of the total served population. More than 90% of PHCCs have diabetic files, registers, appointment system and protocol for diagnosis and treatment of diabetes. Oral hypoglycemic agents were always available at 55% of PHCCs while metformin was not available at 52% of PHCCs. Diabetic identification cards were available in 80.4% of PHCCs while the health education means were less available, except for health education programs was available at 97.5% of PHCCs. At least, 40% of PHCCs were provided financially or by different means of health education through community health committees.

Conclusion: This study revealed that resource items for diabetic care are inadequate in particular drugs and laboratory facilities. Establishment of a diabetes committee in Aseer region is a priority in order to manage such shortages and to plan, supervise and coordinate the diabetic care in the region.

Saudi Med J 2002; Vol. 23 (12): 1509-1513

Diabetes mellitus (DM) is one of the most common metabolic disorders in the Kingdom of Saudi Arabia (KSA). According to some national epidemiological studies, the prevalence of DM is increasing dramatically.[1,2] In the Southern region, the prevalence of DM ranged from 3.8-10.8%.[1,2] Inspite of the fact that DM is an increasing and a major health problem in Aseer region, the introduced care to the diabetics is still below the expected national targets as reported by some studies during the past 5 years.[3,4] Most of these reports and studies blamed the health system as one of the barriers that was unable to provide the minimum infrastructures for diabetic care which resulted in poor processes and outcomes among diabetics. Other studies from Aseer region found that many procedures including laboratory investigations were less than the national targets due to lack of coordination between the Primary health care centers (PHCCs) and the district hospitals.[5,6] However, most of the previous studies were

From the College of Health Sciences (Al-Khaldi) and the General Directorate of Hospital (Al-Sharif), Ministry of Health, Abha, *Kingdom of Saudi Arabia*.

Received 21st April 2002. Accepted for publication in final form 13th August 2002.

Address correspondence and reprint request to: Dr. Yahia M. Al-Khaldi, PO Box 2653, Abha, *Kingdom of Saudi Arabia*. Tel./Fax. +966 (7) 2271666. E-mail: yahiammh@hotmail.com

conducted in a few practices which made generalization of these findings difficult to accept. The objective of this study is to evaluate the availability of the essential diabetic resources in primary health care (PHC) setting in Aseer Region, Southwest of KSA.

Methods. Aseer is one of the administrative regions of KSA with a total population of 1.2 million. The health services in this region are provided through a network of PHCCs, general hospitals and one central hospital. In order to make health services accessible to every one, the region is divided into 14 health sectors. Each sector consists of a group of PHCCs and one general hospital. Those patients who need secondary care are referred from PHCCS to general hospitals through formal referral forms to the concerned specialists. Diabetic care in Aseer region, as other health care services are provided by the governmental agencies (Ministry of Health [MOH], Ministry of Defense and Aviation [MODA], Ministry of Interior [MOI] and some private hospitals and poly-clinics). To achieve the objective of this study, the investigators designed a questionnaire based on the quality assurance and mini-clinics manuals issued by the Directorate General of Primary Health Care Centers.[7,8] The questionnaire consisted of 6 main sections: The 1st section dealt with essential data regarding PHCCs, namely, total served population, distance from the nearest general hospital, type of road, number of served diabetics at each PHCC, number of working physicians and nurses; the 2nd section was regarding the presence of the diabetic mini-clinic, diabetic health educator or trained nurse to conduct health education for diabetics, appointment system, recall system, diabetic files, diabetic registers, referral registers for diabetics, protocol for diagnosis and management of DM, attending diabetes training course by the working physicians, ability of doctor to perform fundoscopy for diabetics, presence of coordination between the PHCC and the referred general hospital. The 3rd section was concerned with the availability of the essential drugs for diabetes. The 4th section inquired about the degree of availability of the essential items of laboratory investigations and the related laboratory tools at PHCCs (glucometer, glucosticks, sticks for detection of protein in urine). The availability of the essential structures in the 3rd and 4th section were assessed by using 4 point-scales (4=always, 3=often, 2=rare, 1=never). The 5th section was regarding the availability of diabetic health education materials (booklets, posters, pamphlets, video tapes, health education program and diabetes identification card). This part was assessed by using 2 point scales (1= available, 0=not available). The last section was about the patterns of participation of the community and the health committees in supporting diabetics at PHCC). This parts consisted of 5 items: (financial donation, providing PHCC with glucometer, providing PHCC with glucosticks, printing health education materials, provision of audiovisual aids, prepare or build venues for health education programs. The questionnaire was delivered by mail during September 2001 to the working technical supervisors at all sectors who distributed it to all PHCCs in their sectors, collected the response and returned it within 4 weeks to the technical directorate of PHC in Health Affairs of Aseer Region. In order to obtain reliable data, the name, the signature of technical director of PHCC and the stamp of the PHCC were asked to be put in the front page. The data of the questionnaire were entered and analyzed by using Statistical Package for Social Sciences (SPSS).

Results. Two hundred and forty-two out of 245 PHCCs (98.8%) in Aseer region responded to the questionnaire. Three PHCCs did not responded as the technical directors were on annual vacation. **Table 1** summarizes the profile of PHCCs in Aseer region. These PHCCs served more than 970,000 individuals. The mean distance between PHCCs and the hospitals is 34.3 kilometers, most of the roads between these PHCCs and hospitals are paved. The total number of the working physicians was 391 and nurses was 902. The total served diabetics was 26,313, more than 56% of them were males. **Table 2** shows the availability of essential infrastructures in PHCCs in Aseer Region. Approximately three-fourths of PHCCs have diabetic mini-clinics, more than 90% of the PHCCs have an appointment system, diabetic files, diabetic registers, diabetic referral records, protocol for diagnosis, treatment and follow up of diabetes. On the other hand, a recall system was available in 82% of PHCCs, health educators were present in 8% or trained nurses for diabetic health education were present in 43.4%. These attending diabetic training courses was 18% and ability to perform fundoscopy was 16.4%. **Table 3** depicts the degree of availability of essential drugs and laboratory tools for diabetic care in PHCCs in Aseer region. Oral hypoglycemic agents (OHAs) were always available in 55% of the PHCCs while metformin and insulin were frequently available in less than one quarter of PHCCs. On the other hand, the laboratory related items such as glucometers, sticks of testing for glucose and urine protein were always available in more than two-thirds of PHCCs in Aseer region. Regarding the availability of health education means for diabetes, it was found that health education programs on diabetes were available at 97.5%, presence of diabetes identification cards 80.4%, posters 74.4%, pamphlets 55%, booklets 44%, and videotapes 11% of PHCCs. Concerning community participation in diabetic care, it was found that 40% of PHCCs received financial

Table 1 - Profile of primary health care centers in Aseer region, Kingdom of Saudi Arabia, 2001 (n=242).

Profile	**n (%)**
Total served population	970306
Type of road connects PHCC & Hospitals	
Paved	198 (82)
Sandy	5 (2)
Mountain	21 (9)
Mixed	18 (7.4)
Total physicians at PHCC	391
Total nurses at PHCC	902
Total n of served diabetics at PHCC	26313
Male	14868 (56.5)
Female	11445 (43.5)
Presence of coordination with district hospital	154 (63.6)
Distance from the nearest hospital (km) = 34.3 ± 31.6 (median = 25km).	

n - number

Table 2 - Frequency and percentage of availability of essential diabetic infrastructures at primary health care centers in Aseer region, Kingdom of Saudi Arabia.

Infrastructures	**n (%)**
Mini-clinic	180 (74.4)
Health educator	20 (8)
Trained nurse to conduct health education	105 (43.4)
Appointment system for diabetics	220 (91)
Recall system for diabetic defaulters	198 (82)
Diabetic files	236 (97.5)
Diabetic register	240 (99)
Register for diabetic referral	237 (98)
Protocol for diagnosis, treatment and follow-up DM	233 (96)
Attending of diabetes training course by one of the physicians at PHCC	71 (29)
Ability of physicians to perform fundoscopy for diabetics	64 (26.4)

n - number, DM - diabetes mellitus

Table 3 - Frequency and percentage of availability of essential drugs and laboratory items for diabetics at primary health care centers in Aseer region, Kingdom of Saudi Arabia.

Items	**Degree of availability**			
	Always n (%)	**Often n (%)**	**Rare n (%)**	**Never n (%)**
Oral hypoglycemic agents	134 (55)	92 (38)	16 (7)	0 (0)
Metformin	25 (10)	30 (12)	61 (25)	125 (52)
Insulin	34 (14)	19 (8)	83 (34)	105 (43)
Glucose solution	207 (86)	14 (6)	11 (45)	10 (4)
Insulin syringes	156 (64.5)	61 (25)	12 (5)	13 (5.5)
Drug refill cards	185 (76)	29 (12)	12 (5)	15 (6)
Glucometer	190 (79)	0 (0)	0 (0)	52 (21)
Glucosticks	126 (52)	64 (26.4)	13 (5.4)	39 (16)
Sticks for testing protein in urine	159 (66)	40 (17)	11 (5)	30 (12)

n - number

supplies, 38% of PHCCs were provided with glucometers, 37% were provided with printing health education materials, 36% supplied with glucosticks, 23% were provided with audiovisual aids while 38% of the committee at PHCCs built special venues for conducting health education sessions.

Discussion. Successful process and good diabetic outcomes are based on providing adequate infrastructure items.[7,8] Previous studies from Aseer region revealed that poor process and outcomes could be contributed significantly to lacking of adequate and essential infrastructures for diabetic care.[3-6,9,10] All those studies were conducted in few practices which made their generalizations questionable. In this study, which involved almost all PHCCs in Aseer region, a clear picture regarding the diabetic infrastructure items has become obvious. More than 970,000 citizens are served by 242 PHCCs at which 391 physicians and 902 nurses work. As a result, the nurse to population ratio was 1:1076 and the physician to population ratio was 1:2482. This figures were lower than that reported on the national level in 2 consecutive annual reports issued by the MOH in 1996 and 1998.[11,12] Percentage of registered diabetics in Aseer region according to this study was 2.7%. The figures were less than those reported by Warsy and El-Hazmi[1] 3.8-4%, Al-Nuaim et al[2] 8.7-10.8%, and Khoja and Farid[13] 5.8-6.3%. The difference could be due to the different methods used, in addition, some diabetics were followed in other health sectors or under-diagnosis of diabetes in Aseer region. This study revealed that there was a wide variety in availability of diabetic resources items. Diabetic related records, files, registers, protocol, recall and appointment systems were available at more than 80% of PHCCs in the region. This high figure could be attributed to the regular evaluation of diabetic program at PHCCs by the sectoral and regional technical supervisors. The impact of mini-clinic on diabetic care was evaluated in one large PHCC in Aseer region, it was found that such type of practice generally improved the diabetic care.[14] In the current study 74.4% of PHCCs have diabetic mini-clinics. These changes in the diabetic care in Aseer region were encourgeable. However, regular evaluation of the cost-benefit of mini-clinics is suggested. Attending diabetes training course and ability of carrying fundoscopy by PHCCs physicians were less satisfactory. In order to introduce good quality care for diabetics, it is necessary to conduct intensive training program for physicians on diabetes and to send the interested physicians to the eye clinics in order to learn how to conduct the proper fundoscopy.[6] Different diabetic drugs are essential if diet therapy fails to achieve good metabolic diabetic control. Our findings revealed that oral hypoglycemic agents such as glibenclamide were available at all time in 55% of PHCCs while metformin and insulin were rarely available. On the other hand, glucometers, glucosticks and sticks of testing urine for protein were not available adequately in 20% of PHCCs. Previous studies from Aseer region revealed that lack and shortage of drugs and inability of PHCCs to carry out blood and urine analysis for sugar were contributed significantly to poor compliance to the medical advice and increasing defaulters among diabetics.[3-5,9,14] To overcome this shortage, the medical supply in cooperation with the PHC department at each sector should distribute the drugs and laboratory requirements according to the number and the actual needs of diabetics at each PHCC. Our daily observations in practice revealed that providing diabetics with drug refill cards give a good impact on rationalization of drugs prescribing and improvement in appointment compliance among diabetics. These positive changes mandate the importance of availability of these cards in adequate numbers in each PHCC. Health education is considered the corner stone of successful diabetes management. In a study conducted in a large PHCC in Aseer region, it was found that absence of health educator and inadequate health education materials stand behind poor health education program in that PHCC.[10] In this study, only 8% of PHCCs have health educators and 43.4% trained nurses who can conduct health education. On the other hand, availability of health education materials and means were inadequate except for health education program at PHCCs. To achieve high quality health education for diabetics, it is essential to train all nurses who run diabetic clinics in order to manage the shortage in health educators in the region, provide all PHCCs with adequate health education materials in coordination with health education department in the region. Community participation is an important element of PHC.[15] Community can support PHC settings through the local health committees. In this study many patterns of community participation were present. Financial donation and providing PHCCs with laboratory and health education means and material were the major types of community participation in the region. In order to facilitate community participation in this regard, it is vital to involve the teachers, religious leaders and the other community leaders in planning, implementing and evaluating the local diabetic program at the PHCCs level. Diabetic care needs coordination from district hospital in order to perform some periodic examinations such as fundoscopy, kidney function test and lipid profile.[7,8] Approximately 35% of PHCCs in Aseer region lack of coordination with their referred hospitals. In previous studies, it was reported that referral system in Aseer region which lack of coordination offices contributed significantly to low percentage of diabetics who did annual check up for their eyes, kidneys and lipids.[6,16] In order to

optimize the referral and coordination processes for diabetics, it is mandatory to implement the recommendations issued by MOH.[7,8]

Recommendations. In order to introduce good diabetic care in Aseer region we suggest the following recommendations: 1) All PHCCs should be provided with adequate diabetes related resources according to their actual needs. 2) Conducting regular training courses on diabetes for PHC physicians and nurses. 3) Improving the referral system between PHCCs and hospitals through providing the hospitals with coordination offices, essential resources and qualified coordinators. 4) Involving the community leaders in planing and evaluation of diabetes program at PHCCs in order to activate their roles in diabetes management. 5) Establishing a diabetic committee in Aseer Region to plan, supervise and coordinate diabetic related care in the region.

In conclusion, this study revealed that some important items of infrastructures diabetic care in Aseer region are not adequately available particularly drugs, laboratory facilities and health education materials. Establishment a Regional Diabetic Committee (RDC) can overcome such shortage through regular supervision of diabetic care and coordination with the other relevant diabetic care affairs.

References

1. Warsy AS, El-Hazmi MAF. Diabetes mellitus, hypertension and obesity. Common multi-factorial disorders in Saudis. *East Mediterr Health J* 1999; 5: 1236-1242.
2. Al-Nuaim A, Rubean K, Al-Mazrou Y, Khoja T, Al-Attas O, Al-Daghri N. National Chronic Metabolic Diseases Survey. Part I. Riyadh (KSA): Ministry of Health and King Saud University; 1995. p. 31.
3. Khattab M, Abolfotouh M, Alakija W, Humaidi M, Al-Tokhy M, Al-Khaldi Y. Audit of Diabetic Care in an Academic Family Practice in Asir Region, Saudi Arabia. *Diabetes Res* 1996; 31: 243-254.
4. Khattab MS, Al-Khaldi YM, Abolfotouh MA, Khan MY, Al-Kija W, Al-Tokhy M. Impact of diabetic program in a family practice setting in Asir Region, Saudi Arabia. *Diabetes Res* 1998; 33: 115-127.
5. Khattab M, Alakija W, Abolfotouh MA, Humaidi M, Al-Tokhy M, Al-Kaldi Y. Obstacles to and solutions for optimal implementation of primary care for diabetics in Abha, Asir Region, Saudi Arabia. *Saudi Med J* 1997; 18: 236-239.
6. Al-Khaldi YM, Khan MY, Khairallah SH. Audit of referral of diabetic patients to an eye clinic from Primary Health Care Clinic. *Saudi Med J* 2002; 23: 177-181.
7. The Scientific Committee of Quality Assurance in Primary Health Care. Quality assurance in primary health care manual. Riyadh (KSA): Ministry of Health; 1994. p. 199-223.
8. Scientific Committee. Chronic Diseases Care Manual at Primary Care: Specialized clinics. Riyadh (KSA): Ministry of Health; 2001. p. 12-38.
9. Al-Khaldi YM, Al-Jaser AM, Al-Gelban KS. Barriers to compliance among diabetics in Asir region. *Saudi Med J* 1999; 20: 951-953.
10. Al-Khaldi YM, Khan MY. Audit of a diabetic health education program at a large primary health care center in Asir region. *Saudi Med J* 2000; 21: 838-842.
11. Ministry of Health. Annual Health Report. Riyadh (KSA): Ministry of Health; 1996. p. 77.
12. Ministry of Health. Annual Health Report. Riyadh (KSA): Ministry of Health; 1998. p. 79.
13. Khoja TA, Farid SM. Saudi Arabia Family Health Survey. Riyadh (KSA): Ministry of Health; 1996. p. 57-60.
14. Al-Khaldi YM, Khan MY. Impact of mini-clinic on diabetes care at primary health care center in Aseer region. *Saudi Med J* 2002; 23: 51-55.
15. Al-Mazrou Y, Alshehri S, Rao M. Principles and practice of primary health care. Riyadh (KSA): Ministry of Health, General Directorate of Health Centers; 1990. p. 22.