

## Diabetes Care in Oman Obstacles and solutions

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### رعاية مرضى السكري في سلطنة عُمان المعوقات والحلول

سيف اليعربي

الملخص: يعتبر مرض السكري من الأمراض المزمنة التي تعاني منها معظم دول العالم ويُعد من التحديات الخطيرة في العصر الحالي نظرا لانتشاره السريع، ودول الخليج ليست استثناء. تتطلب رعاية مرض السكري تعاون كافة الجهات الصحية الحكومية والخاصة وتعاون كافة قطاعات المجتمع بما يكفل توفير الدعم المادي اللازم. وفي سلطنة عُمان هناك عدة عوامل يمكن أن تؤثر على رعاية مرض السكري. ناقش في هذا المقال بعضا من هذه المعوقات ونعرض بعض الحلول المناسبة لها.

مفتاح الكلمات: رعاية مرض السكري، عُمان.

**ABSTRACT:** Diabetes has become one of the most challenging chronic diseases with its prevalence increasing in most countries worldwide. The Arabian Gulf countries face a similar increasing prevalence of diabetes. Diabetes care requires not only the support of the health authorities, but the contribution of all the sectors of the community and requires good financial support. In Oman, there are many factors which affect the care of diabetes. In this article, these factors are addressed and recommended solutions discussed.

**Keywords:** Diabetes care; Oman; Obstacles; Solutions

**D**IABETES HAS BECOME ONE OF THE largest burdens on health care systems worldwide. With the alarming global increase in people who are overweight and obese, the diabetes problem will be magnified. India, China and the USA had the highest number of people with diabetes in 2000 (31.7 million, 20.8 million and 17.7 million, respectively). The numbers are expected to increase by 2030 to 7.9 million, 42.3 million and 30.3 million, respectively. The numbers in North and South America and Africa as a whole are expected to double between 2000 and 2030 while in Asia and Australia combined the numbers are expected to rise in the same period at an even faster rate (from 82.7 to 190.5 million).<sup>1</sup>

Obesity has reached epidemic proportions globally, with more than 1 billion adults overweight at least 300 million of them clinically obese—and it is a major contributor to the global burden of chronic disease and disability.<sup>2,3</sup> In children the trend is almost the same<sup>4,5</sup> and a previous study in Oman showed a doubling of cases of overweight

grade 10 students between 2004 and 2008.<sup>6</sup>

Currently type 2 Diabetes affects obese children even before puberty. Approximately 85% of people with diabetes are type 2 diabetics, and the majority is obese or overweight. It was also noted that the new emerging markets with high yearly economic growth had the highest number of diabetics. If current trends continue, by 2025 India and the Middle East region will be the most affected areas in the world.<sup>2,3</sup> In the Arabian Gulf countries, we are facing a huge challenge with a similar increase in the prevalence of diabetes [Table 1].<sup>7,1</sup> A national survey in the United Arab Emirates (UAE) conducted jointly by the World Health Organization (WHO) and the UAE Ministry of Health between 1998 and 2000 reported that 19.6% of the population had diabetes, while among UAE citizens (as opposed to expatriates) it was 24%. The UAE currently has the second highest rate of diabetes in the world.<sup>8</sup>

In Oman, the prevalence is not very different. In 2000, the age-adjusted prevalence of diabetes among Omanis aged 30–64 years reached 16.1% compared

with 12.2% in 1991.<sup>9</sup> The estimated economic cost of diabetes in 2007 in USA was \$174 billion for a population of over 311 million.<sup>10</sup> The cost is divided between the direct medical costs of \$116 billion and indirect costs, (such as lost workdays, restricted activity, and disability due to diabetes) of \$58 billion.<sup>10</sup> By contrast, with a total population of only around 4 million, the UAE spent \$436 million (1.6 billion Dirhams) on diabetes related treatments in 2007.<sup>8</sup> Diabetes treatment and its complications will soon consume most of its national health care budget. In a recent study involving six health centres from the Muscat region, only 2.4% of diabetic patients achieved international recognised goals for all 6 diabetes factors (HbA1C <7%; BP <-130/80 mmhg; total cholesterol <5.2 mmol/l; low-density lipoproteins cholesterol (LDL) <3.3 mmol/l; high-density lipoproteins cholesterol (HDL) >1.1–<1.68 mmol/l, and triglyceride (TGD) <1.8 mmol/l.<sup>11</sup>

There are many factors which affect diabetes care in Oman and result in poor diabetes control. The link between the poor control of diabetes and the higher risk of microvascular and macrovascular complications is well established. The work done by the UK Prospective Diabetes Study (UKPDS) and the Diabetes Control and Complications Trial (DCCT) is the landmark study in this field.<sup>12,13</sup>

## Major Obstacles Affecting Diabetes Care in Oman

### HEALTH CARE SYSTEM ORGANISATION

Diabetes is considered as a model for chronic disease management. In order to cope with diabetes, the Omani health care system will not only need the implementation of evidence-based clinical practice, but also a reframing of the existing community health care system. This is because the current health care policies and delivery system do not fully support the management of diabetes. The health care system in Oman is based on the primary health care system and all patients with diabetes are followed up at this level, leaving the complicated cases to secondary or tertiary hospital care. Not all the primary health care facilities have diabetologists so most of these patients are looked after by non-specialised primary health care physicians. Health centres are not equipped with facilities for the early detection of the complications of diabetes as most

of these tests are done in tertiary care facilities. This may therefore affect the quality of diabetic care. Another issue is the initiation of the insulin policy which only allows tertiary hospitals and certain health centres to prescribe insulin therapy.

Chronic disease management should be framed within the context of the chronic care model (CCM). The non-adoption of this model will result in disorganisation of care and wastage of resources. The UK, Australia, New Zealand and Canada have taken the lead in adopting models of chronic care.<sup>15-19</sup>

In the Gulf countries, some efforts are being made in the right direction for diabetes care, e.g. the recently established national committees and campaigns to raise awareness about diabetes and the standards of its care.

### FINANCIAL RESOURCES FOR DIABETES CARE

Prescribing medications is not the most important factor in diabetes control. Monitoring blood glucose levels is associated with much better control and hence less complications as supported by the DCCT and UKPDS studies.<sup>12,13</sup> Some of the benefits of glucose monitoring at home are that it: 1) Helps to monitor immediate and daily levels of control; 2) Detects hypoglycaemia; 3) Assists in the safe management of hyperglycaemia, and 4) Has educational value in assessing blood glucose (BG), responses to insulin, food and exercise. However, glucose strips for home testing are not provided free by the health care system. Unfortunately, many patients have a low incomes and the cost of glucose strips is approximately Omani rials (OR) 15 to 50 (= US \$39 to 130) per patient per month. Moreover, newer modalities of treatment and monitoring are also not supported by the health care system e.g. insulin pens, insulin pumps and continuous glucose monitoring systems, etc.

### HUMAN PROFESSIONAL RESOURCES

There is a severe shortage of medical professionals worldwide and fierce competition between various countries to recruit them. Oman is not an exception and the numbers of certified physicians in the field are inadequate compared to the number of diabetic patients. According to the 2009 annual report of the Omani Ministry of Health, there are only 18 certified diabetologists in the whole of Oman.<sup>20</sup>

**Table 1:** Actual & projected numbers of diabetics in selected countries of the World Health Organization's Eastern Mediterranean Region

Country	Total numbers in 2000	% Population in 2000	Projected numbers in 2030
United Arab Emirates	350,000	7.78	684,000
Bahrain	37,000	5.96	99,000
Qatar	38,000	4.67	88,000
Oman	113,000	4.40	343,000
Lebanon	146,000	4.08	378,000
Kuwait	104,000	3.87	319,000
Pakistan	5,217,000	3.73	13,853,000
Saudi Arabia	890,000	3.62	2,523,000
Egypt	2,623,000	3.54	6,726,000
Jordan	195,000	3.42	680,000
Syria	627,000	3.29	2,313,000
Iran	2,103,000	3.02	6,421,000
Iraq	668,000	2.32	2,009,000
Afghanistan	468,000	1.57	1,403,000
Yemen	327,000	1.56	1,286,000
Libya	88,000	1.50	245,000
Sudan	447,000	1.23	1,277,000

Moreover, other health professionals specialised the field of diabetes are even more scarce, e.g. diabetic education nurses, social workers, psychiatrists, podiatrists and dietitians. The population of Oman is distributed over a wide geographic area and reaching diabetics in their communities is difficult and very expensive.

#### TREATMENT PROTOCOLS

The adoption of internationally accepted treatment protocols is fundamental in the treatment of diabetic patients. The current protocol followed in Oman has not been updated since 2003. There is also a general tendency to delay the initiation of insulin treatment. Moreover, the practice of limiting the initiation of insulin and the adjustment of doses to certain specialised clinics and to tertiary hospitals has led to the poor management and non-compliance of patients. The lack of adherence to the international diabetes guidelines is reflected in the large percentage of diabetic patients not achieving

internationally accepted glycated haemoglobin targets.<sup>11</sup>

#### AVAILABILITY OF MEDICATIONS

Diabetes is a chronic disease with fatal complications. In the last 50 years, there have been tremendous improvements in the type of insulin and the oral hypoglycaemic agents available for treating diabetics. New insulin analogues have appeared in the market and new insulin regimens have been introduced in the guidelines. New oral hypoglycaemic agents have also been recently discovered. The unavailability of these medications in Oman and the use of generic medications have left the physicians with very few alternatives to upgrade the treatment to achieve better control. However, there is no evidence so far to prove that the new medications are more effective and the generic medications are less potent.

#### LABORATORY SUPPORT

Most Omani diabetic patients have associated hypertension and obesity (metabolic syndrome). In these patients, the HbA1c, lipid profile, renal functions, liver function tests and albumin creatinine ratio have to be monitored very closely on a regular basis. HbA1c and lipid profile tests are not done in primary health centres on a regular basis and the samples are sent to the nearest tertiary hospital for testing which delays the results and consequently the follow-up of the treatment.

#### DIABETES HEALTH CARE TEAM

Diabetes needs a multidisciplinary approach for effective care of diabetics. The team should consist of a specialist/family physician, a diabetes educator, a dietitian, a social worker, a podiatrist and a psychiatrist. This team should have a proper and effective communication network within the health care system and the community. Most of the time, this team approach does not exist because of lack of human resources or unavailability of the services. As a result, the patients mostly see only the treating physician.

#### PATIENT AND SOCIETY CONTRIBUTIONS AND RESPONSIBILITIES

Oman is similar to the other Gulf countries in its rapidly changing patterns of behaviour, a

consequence of the oil business and industrial boom. Our ancestors used to wake up early, have a good breakfast and burn plenty of calories during the day. Later, they would have an early dinner and a good night's sleep. Now we tend to get up late, have little or no breakfast, a lunch with heavy carbohydrate content and late dinner. A sedentary lifestyle and lack of exercise is becoming the trend.<sup>21</sup>

Junk food in Oman is relatively cheap and widely available. In 2004, the Ministry of Health studied the food habits of school children in Oman. They found that 95% of schools sold chips, 79% cheese sandwiches, 78% biscuits and 57% cakes.<sup>6</sup> These changes in eating behaviour and attitudes towards food and exercise have disturbed body metabolism and resulted in an energy imbalance with more energy being stored and less energy consumed. The best example of food habits that affect diabetes control is the heavy lunch with high carbohydrate content that leads to a high excursion of blood glucose levels lasting until dinner time and carrying on to overnight. The usual twice daily insulin will not cover the lunch glucose excursion and patient should either be given short acting insulin or decrease their carbohydrate content at lunch time. Patients also tend not to follow the dietary advice strictly and do not comply with medications. Non-compliance may be a problem although evidence from Oman is lacking; this is maybe partly related to poor patient education and low communication skills in health professionals. It is very difficult for the treating physician to adjust the medications and upgrade the treatment if the patients are noncompliant.

#### OMAN DIABETES ASSOCIATION

The Oman Diabetes Association has been active in the last few years specifically in terms of patient advocacy. The Association actively participates in fund raising activities for diabetic patients and in providing continuous medical education for professionals. The Association also organises activities on the World Day of Diabetes each year. However, a lot of effort is required from the community to assist the Association both administratively and financially.

## Solutions

In the following sections some solutions are

recommended which may benefit diabetes care in Oman.

#### HEALTH CARE SYSTEM ORGANISATION

The chronic care model is based on the WHO's Innovative Care for Chronic Conditions Framework.<sup>22,23</sup> This Framework recognises the need to expand the delivery of health care from acute care to a system that includes prevention and advanced management. It includes six interrelated components that are the key to improving care: 1) Community resources and policy; 2) Health system organisation of health care; 3) Self-management support; 4) Delivery system design; 5) Decision support, and 6) Clinical information system.<sup>24,25</sup> The adoption of such a system by health care authorities in Oman is a key element in the success of diabetes care.

The success of diabetic care depends also on 5 basic key components:<sup>22,24</sup> 1) Identification of patients with diabetes; 2) Accurate diabetes registry; 3) Systematic recall process; 4) Clinical flow sheets, and 5) Diabetes focus groups/group visits.

#### FINANCIAL SUPPORT FOR DIABETES CARE

All diabetic patients in Oman should be provided with free glucose meter strips as part of the treatment package. Insulin pumps should also be subsidised at least for type 1 diabetic patients.

#### HUMAN PROFESSIONAL RESOURCES

The health care system should attract diabetologists and other medical professionals from abroad by offering them contracts with reasonable salaries, allowances and incentives comparable to other Arabian Gulf countries. Omani medical residents should be encouraged to join diabetes fellowship programmes for training. Continuous medical education programmes should be held throughout the country for nurses and dietitians on a regular basis. All regional hospitals should have a complete diabetes team consisting of qualified diabetologists/family physicians, diabetes educators, podiatrists, dietitians, psychiatrists and social workers.

#### TREATMENT PROTOCOLS

The treating physicians should be up-to-date on the latest diabetes treatment guidelines and should strictly follow the international recommendations.

Continuous medical education should be provided regularly to all members of the Diabetic Care Team in all the regions. The Omani health care organisation should ensure that all the necessary policies and arrangements are in place and that the international guidelines are accessible and easy to implement.

#### AVAILABILITY OF MEDICATIONS

Brand name oral hypoglycaemic agents should be widely available. New agents should be introduced to the protocols. Insulin analogs, with their new delivery devices, should also be accessible to all patients in Oman. A system of providing insulin pumps with patients bearing only part of the cost should be established for qualifying patients.

#### LABORATORY SUPPORT

The treating physicians in local health centers and regional hospitals should be able to order all the necessary investigations for the treatment of diabetes and its comorbidities and receive the results rapidly.

#### PATIENT AND SOCIETY CONTRIBUTIONS AND RESPONSIBILITIES

Patients should follow the medical and the dietary advice strictly, take their medications, check their glucose daily and keep a log book in a responsible manner. A sedentary life style must be avoided; patients should be more active and exercise daily for a minimum of 30 minutes. The weather in Oman has been always been hot; however, this did not preclude previous generations from being physically active. A good alternative is indoor gyms which are available at a reasonable cost. Diabetes education should be carried out not only by the medical team, but also by the mass media.

#### DIABETES HEALTH CARE TEAM

Diabetes educators and physicians should have the responsibility of teaching patients about their chronic disease and diabetes control. Understanding the basic concepts of glycated haemoglobin, dietary control, carbohydrate counting and multiple daily injections is crucial for better control.

Type 1 diabetic patients should be introduced to the concept of carbohydrate counting and offered multiple daily injections (or continuous

subcutaneous insulin infusion) of long-acting insulin as basal insulin, as well as fast or short-acting insulin to cover glucose from meals. This will not only improve their glycaemic control, but also give them flexibility in their daily routine. Finally, coordinated efforts between health care authorities, physicians, diabetic health teams, patients, the community and the media are needed to optimise diabetic care in Oman. The first step forward in this direction, is the opening of a National Diabetes Centre in Oman which should be the organising and coordinating body for diabetic care in the country

## Conclusion

Diabetes is a chronic disease and its care requires a lot of effort. In Oman, there are many obstacles that affect optimum diabetes care, linked to various factors including the health care system, financial resources, lack of professional human resources, inadequate laboratory support and availability of medications. Organised efforts by health care policy makers should be made as soon as possible to improve the current disorganised practice. Application of the current WHO chronic care model is of key importance. Contributions from various sectors of society and the cooperation of patients are important additional factors in successful diabetes care. With the expected increase in the number of diabetics in Oman, it is highly recommended to conduct further prospective research.

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