



A Profile of Diabetic Complications in North West Region of Oman: A Preliminary Report

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Abstract

Background: Diabetes mellitus is known to be associated with health complications of kidney, heart, eyes.

Objective: In order to understand the gravity of complications prevailing among the diabetic patients living in the North West region of Oman, the country bordering the three states of the Arab World this retrospective analysis was undertaken.

Methods: The medical records on the patients with diabetes were accessed to analyse for kinds of complications developed over a period while during the hospital stay or attending the diabetic clinics.

Results: A significant association (p 0.0056) of complications involving organs like eye, heart and kidney was observed among the patients with Diabetic Mellitus Type 2 (DMT2). Those involving complications of eye (alone or together with other two complications) were significantly associated (p 0.0149) with the diabetic patients in the two categories.

Conclusions: The patients with good control of sugar got the complications much later in life as compared to those with a poor control of sugar. However, the extent of complications involved was found varied among different patients as well as the duration of the hyperglycaemic state.

Keywords: Diabetes, complications, Oman.

Introduction

Diabetes mellitus (DM) is a metabolic disorder with impaired metabolism of glucose causing cumulative effect on health status of an individual. It is growing at an alarming proportion throughout the world and the Sultanate of Oman ranks 12th for its prevalence in indigenous population.¹ DM affects the vital organs like kidney, heart and brain attributing to untoward morbidity and mortality. A

tight control of sugar by changing life style as to diet and exercise, besides being treated by medication is of paramount importance in reducing morbidity and mortality. Sultanate of Oman has been recognized by W.H.O. as having one of the best health care systems,² and every facet of the health care is tackled at different levels of facilities. For example, a patient once diagnosed to have impaired glucose metabolic

function, he/she is enrolled with designated diabetic clinic for monitoring through regular followed up action for sugar control. Besides, utmost vigilance is exercised on patients developing diabetes associated complications. Present report deals with an analysis on various complications developed among diabetic patients in the North West region of Oman.

Material and Methods

The data was collected from the patients records maintained with the medical facilities like Primary Health Centre and the Regional Hospital in the area. Statistical analysis was carried out by Fisher's exact test on a 2x2 contingency table using Graph Pade software online.³

Results

In a total of 300 patients with DM were analysed, including 34 with Diabetes mellitus Type 1 (DMT-1) and 266 with Diabetes mellitus Type 2 (DMT-2) in the age groups ranging from 14 to 88 years. The gender distribution of the subjects includes 115 male and 185 female. A half of the patients, including 25 with DMT-1 and 125 with DMT-2 did not have any diabetes associated complications. The other half of the patients in the

two categories showed the diabetic associated complications of the three organs, viz. eye, heart and kidney. A single-organ complication of eye (E) or heart (H) was 12 to 16 times more pronounced among the patients with DMT-2 as compared to DMT-1, though such a difference was not seen for the renal (R) involvement. Likewise, the combination of an involvement of the two organs, i.e. H/E, or R/E or R/H was also found only in DMT-2 patients. In similar note, an involvement of all the 3 organs was seen among 5 of the 6 patients with DMT-2 category (Tables 1). There was no significant difference among the gender of the patients for development of diabetic associated complications. However, there was preponderance of male for the development of the complication in eye among the patient having DMT-1. (3 in 25 male vs none in 40 patients) (Table 2).

The association between age of the patients and development of complications in DMT-1 was not statistically significant. However, in DMT-2, there was an increasing trend tfor development of complications as age advances, presumably reflecting the duration of uncontrolled hyperglycemic state (data not tabulated).

Table 1: Complications associated with the types of diabetes.

Complications	Types of Diabetes		
	DMT-1	DMT-2	Total
Eye (E), Only	2	24	26
Heart (H) , Only	4	64	68
Renal(R), Only	2	2	4
H/E, both	0	26	26
R/E, both	0	7	7
R/H, both	0	13	13
E/H/R – all the three	1	5	6
Total	9	141	150

Table 2 shows diabetes related complications among males and females in different types of diabetes.

Complications	Male			Female		
	DMT-1	DMT-2	Total	DMT-1	DMT-2	Total
Eye	3	22	25	0	40	40
Heart	2	42	44	3	66	69
Renal	2	14	16	1	13	14

Discussion

Diabetes mellitus (DM) is a metabolic disorder that cannot be cured but may be controlled through various measures. It is suspected on the basis of signs and symptoms, e.g. osmotic symptoms (polyuria, polydipsia, polyphagia), weight loss, refraction errors, recurrent infections (Dental, pyelonephritis, pneumonia, cholecystitis, fungal) and micro-vascular complications involving retinopathy, nephropathy, and neuropathy. The condition is classified into two categories as DMT-1 and DMT-2 on the basis of the onset of the disease. The condition is associated with grave situations of morbidity and mortality is its severest form.

In present analysis on the patients with DM in North-West region of Oman, we found the patients with DMT-2 had more complications as compared to DMT-1. A plausible explanation could be that the patient with DMT1 is initiated on insulin right from the diagnosis and therefore sugar control remains good from the beginning. However, the patient with DMT2 remains obscure for a long time and it comes to notice only through a chance association of signs and symptoms such as frequent urination, excessive hunger, non-healing wound etc. and initially tried for control of sugar on dietary or exercise or oral medication to exert insulin-producing organ to secrete native insulin.^{4, 5} Although these measures helps in controlling DM for a certain period of time, one never realize if the underlying condition progresses slowly if the existing measures do not control sugar level giving rise to adverse morbidity.

The Ministry of Health, Oman with a good health care facilities² follows a regiment to tackle the DM at the national level. Various modalities adopted at different levels from diagnosis to intervention through well set monitoring programme. Once diagnosed for DM the patient is registered with designated Primary Health Centres (PHC), and followed up in order to monitor for sugar control through a team involving physician to manage medically to

prescribe medication and referring to other medical speciality should a patient requires further attention from secondary or tertiary hospital facilities. Besides, the dietician provides nutritional advise that is important first step in control of diabetes⁴; the nurse specialized in diabetic education provides information regarding diabetic complications including how to tackle with hypoglycaemia as to recognize, treat and avoid complications to developed during insulin administration etc.; the podiatrist that that provides foot care feet assessment by palpitation of pulses, test for sensation and doing reflexes and do dressing for minor ulcers and wounds as part of the medical intervention. The patient is referred to secondary health care facility if he/she is poorly controlled for sugar or gets complications for further workup. The settings of the DM management team at the secondary hospital facility include an endocrinologist, ophthalmologist, nephrologist besides having dietician, diabetic educator, and podiatrist as in PHC but having more experience. Likewise, the settings at the tertiary hospital is in similar line that of the secondary care but with more facilities to specialized management of complications through laser therapy for retinopathy, hemodialysis or renal transplantation for the patient developing end stage renal disease (ESRD), as well as neurologist and cardiologist to treat related complications. The monitoring the patients are in line with recommendation made time and again in literature.^{5,6}

The extent of complications varies from one patient to another as it depends on how good is the sugar control. For example, if a patient with good control of sugar may get complications, if at all, much later in life as compared to the one with a poor control of sugar throughout. In present study the age factor for development of complications was non-significant for DMT-1, though it was more pronounced in patients with DMT-2, presumably due to uncontrolled hyperglycaemia.⁷

Conclusion

The half of the 300 patients enrolled at the diabetes clinic developed complications with three organs like eye and/ or heart and/ or kidney. The complications were more often found among the patients with DMT-2 in higher age group. Preponderance of male for the developing complication in eye among the patient having DMT-1 was noteworthy.

References

1. http://www.khaleejtimes.com/displayarticle.asp?xfile=data/middleeast/2010/October/middleeast_October246.xml§ion=middleeast&col
2. World Health Organization. The World Health Report, 2000. Health Systems: Improving Performance, In: The World Health Report, 2000, p154. (Online) http://www.who.int/whr/2000/en/whr00_en.pdf (date accessed 14.03.2011)]
3. <http://graphpad.com/quickcalcs/contingency2/> online accessed on 24.01.2013].
4. American Diabetes Association. Nutrition recommendations and interventions for diabetes. Diabetes Care, 2008;31(S1): S61-S78.
5. American Diabetes Association. Medical management of hyperglycemia in type 2 diabetes: A consensus algorithm for the initiation and adjustment of therapy. Diabetes Care. 2009;32: 193-203.
6. American Diabetes Association. Standards of medical care in diabetes. Diabetes Care. 2011;34(S1): S11-S61.
7. Brownlee M (2008). Complications of diabetes mellitus. In: Larsen PR., ed., Williams Textbook of Endocrinology, Philadelphia: Saunders Elsevier, 11th ed., pp. 1417-98.