

Characteristics of patients admitted with diabetes in Maseru, Lesotho

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Abstract

Diabetes mellitus is a major cause of morbidity and mortality globally. In 2009, diabetes was the leading non-infectious cause of admissions to public hospitals in Lesotho. Our aim was to investigate the reasons for hospitalisation among diabetic patients in Maseru, Lesotho. We studied the clinical characteristics and medical history of 80 adult patients admitted to Queen Elizabeth II Referral Hospital for the management of uncontrolled diabetes and evaluated the quality of diabetes care prior to admission. The median age was 49 years; 89% of the patients had type 2 diabetes and 74% of patients had been on antidiabetic treatment for more than 1 year. The majority (85%) of patients presented with hyperglycaemia. The most common chronic complication and co-morbidities were diabetic retinopathy (35%) and hypertension (56%) respectively. Most (89%) patients had received diabetes education, but less than half were adherent to recommended lifestyle changes and only 14% performed self-monitoring of blood glucose. The medication non-adherence rate was 20%, and 31% of patients had defaulted from therapy in the previous 6 months. Blood glucose was measured routinely at check-up. In the previous 12 months, 75% of the patients had had eye examinations, but lipid screening, urinalysis, and foot examinations had each been performed on less than one-third of the patients. There were 42% of the patients who had a history of diabetes-related hospitalisations. We concluded that the most common admission cause was hyperglycaemia. In general, there was poor glycaemic control, a high prevalence of complications and high rates of rehospitalisation among the study population. The quality of diabetes care prior to hospitalisation was suboptimal, characterised by low levels of self-management practices and inadequate screening for diabetes complications.

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Introduction

Diabetes mellitus is emerging as one of the most common chronic illnesses with an estimated global prevalence of 220 million people in 2010. Of these, approximately 12.1 million were living in Africa.¹ In Lesotho, an estimated 31 000 people were suffering from diabetes in 2010 and that number is expected to increase to 42 000 by 2030.²

Diabetes is associated with a wide range of microvascular and macrovascular complications including retinopathy, neuropathy, nephropathy, and cardiovascular diseases. The complications of diabetes can be reduced by maintaining euglycaemia and providing continuous medical care and patient self-management education and support.³ In 2009, diabetes was the leading non-infectious cause of admissions to public hospitals in Lesotho.⁴ At present there are limited data on the reasons for hospitalisation among diabetic patients in Lesotho.

The aim of this study was to investigate the reasons for hospitalisation in adult diabetic patients admitted to a tertiary level hospital in Maseru, Lesotho. We studied the clinical characteristics of the patients at admission and assessed the levels of patient self-management and various indicators of healthcare utilisation in order to evaluate the quality of diabetes care prior to hospitalisation.

Patients and methods

Participants

The study subjects were 80 adult patients (age >15 years) admitted to the male and female medical wards at Queen Elizabeth II (QE II) Referral Hospital in Maseru, Lesotho between January and June 2011 with a primary diagnosis of uncontrolled diabetes. All the patients had been on diabetes treatment for at least 1 month. The study was approved by the Lesotho Ministry of Health & Social Welfare (MOHSW) Ethics Committee.

Data collection

Written informed consent was obtained from all study participants. Patients were interviewed to obtain socio-demographic data and medical history. Medical records were reviewed to obtain information on clinical investigations, medications, and follow-up. The duration of diabetes was calculated as the time elapsed between the first record of diabetes treatment and the date of hospitalisation. Patients were interviewed on the following aspects of diabetes self-management: adherence to

Original Article

medication and lifestyle changes, and self-monitoring of blood glucose (SMBG). Non-adherence to medication was defined as having missed at least one dose in the past 7 days and treatment default as interruption of treatment for more than 1 month. We also asked patients about the reasons for non-adherence and defaulting from diabetes care.

We recorded the following measures of healthcare utilisation over the 12 months preceding hospitalisation: frequency of medical checkups, blood glucose and glycosylated haemoglobin (HbA_{1c}) measurements, and blood pressure and lipid profile determinations. Patients were asked whether they had had eye and foot examinations in the previous 12 months and also about previous diabetes-related hospital admissions. Data were analysed using EpiInfo Version 3.5.3. Analysis of data was carried out using descriptive statistics.

Results

Table 1 shows the sociodemographic characteristics and medical history of the study population. From a total of 110 eligible patients, 80 patients could be enrolled;

Sociodemographic characteristics	
Median age, year (IQR)	49 (36–56%)
Gender	
Male	41 (51%)
Female	39 (49%)
Annual household income (USD)	
<1000	61 (76%)
1000–2000	11 (14%)
>2000	8 (10%)
Medical history	
Diabetes type	
Type 1	9 (11%)
Type 2	71 (89%)
Duration of diabetes	
1–3 months	6 (7%)
3–12 months	15 (19%)
>12 months	59 (74%)
Anti-diabetic therapy	
OHA	54 (68%)
Insulin	9 (11%)
OHA + insulin	17 (21%)
Microvascular complications	
Retinopathy	28 (35%)
Diabetic foot	11 (14%)
Nephropathy	5 (6%)
Comorbidities	
Hypertension	45 (56%)
Other	20 (25%)
Reason for admission	
Hyperglycaemia	68 (85%)
Hypoglycaemia	12 (15%)
Note: OHA: oral hypoglycaemic agents	

Table 1 Sociodemographic characteristics and medical history of the study population (n = 80)

30 were excluded due to incomplete medical records (availability of medical records for at least 6 months before hospitalisation).

Table 1 shows that most patients were middle-aged and had type 2 diabetes. Most (90%) patients had a low annual household income, and fewer than 10% had medical aid cover. The most common reason for admission was hyperglycaemia.

Table 2 shows that though most (89%) patients had received diabetes-related education, self-reported adherence to diet and exercise advice was relatively low. Also, only 56% knew the name of the drug they were taking. Access to SMBG was low at 14%. Missed follow-up appointments and treatment default were common. Lack of money was given as the main reason for missing check-ups, and 'feeling better' the main reason for stopping treatment.

In Table 3, it can be seen that 42% of patients had a previous hospitalisation in the past year. At clinic visits most (97%) had a random blood glucose measured, but none had HbA_{1c} checked.

Patient education	Yes	71 (89%)
	No	9 (11%)
Lifestyle	Exercise	32 (40%)
	Diet	37 (46%)
Drug knowledge	Name	45 (56%)
Access to home glucose monitoring		11 (14%)
Non-adherent		16 (20%)
Missed check-up		46 (57%)
Defaulted from therapy		25 (31%)

Table 2 Self-management of diabetes among the study population (n=80)

Check-up frequency	Monthly	58 (72%)
	Every 3 months	22 (27%)
Had the following measured at least once in the previous 3 months	Random blood glucose	78 (97%)
	Blood pressure	71 (89%)
Did not have the following performed in the previous 12 months	HbA _{1c}	80 (100%)
	Lipid profile	60 (75%)
	Urinalysis	59 (73%)
	Foot examination	65 (81%)
	Eye examination	20 (25%)
Previous (1 year) hospitalisation history		34 (42%)

Table 3 Evaluation of diabetes care prior to hospitalisation (n=80)

Discussion

Of the 80 patients enrolled in the study, 52 (65%) were admitted via the outpatient department, 18 (22%) via the emergency department, and 10 (13%) had been referred from other health facilities for further management of chronic complications of diabetes. Most (67%) of the emergency department admissions were due to severe hypoglycaemia (blood glucose <3.0 mmol/l).

The majority of the patients however presented with hyperglycaemia. The rates of self-reported hyperglycaemia were low, a finding which may be explained by low rates of SMBG among the study population. There was a history of long-term poor glycaemic control; more than 90% of the study participants had blood glucose levels higher than the targeted value (<8 mmol/l) during their last checkup. Poor glycaemic control is associated with micro- and macrovascular complications.^{3,5} Of the 41 patients with microvascular complications, nearly a third had been on diabetes treatment for less than 1 year. The presence of diabetes-related microvascular complications in this subpopulation may also be related to late diagnosis of diabetes. Type 2 diabetes is often not diagnosed until complications appear and high rates of undiagnosed diabetes have been reported in Lesotho and other African countries.⁶⁻⁹

The self-reported 7-day medication adherence rates were relatively high (80%), however less than half of the patients were compliant with lifestyle changes and only 14% performed SMBG. The reasons for poor self-care among diabetic patients are multifactorial and have been discussed elsewhere.¹⁰⁻¹² In Lesotho, antidiabetic drugs are provided free of charge in the public sector. The majority of the patients in this study had access to such drugs most of the time. However, financial constraints were an important barrier to dietary compliance and home glucose monitoring. The role of other personal factors should nevertheless not be underestimated; one of the common reasons for non-adherence and defaulting from therapy was feeling better. These findings highlight a need for interventions aimed at improving patient self-management.

We evaluated indicators of healthcare utilisation among the study population. Blood glucose determinations were routinely performed at checkup but none of the patients had HbA_{1c} measurements. There was a high prevalence of hypertension. Blood pressure control was generally poor and body weight and body mass index (BMI) determinations had never been done for the majority of the patients. In the previous 12 months, eye examinations were performed on 75% of the patients but less than a third had urinalysis (26%), lipid profile tests (25%), and foot examinations (19%). The levels of screening for diabetes-related complications found in this study are below the recommended clinical practice for Lesotho, but are consistent with data from other countries in Africa.^{13,14} Prevention of diabetes complications is an integral component of any diabetes management plan. Regular checkups and screening for complications

can facilitate early diagnosis and intervention. However healthcare systems in many resource-limited settings often face several challenges including lack of trained health personnel and inadequate laboratory support, both of which can hamper the implementation of practice guidelines for diabetes care.¹¹

There are several limitations to our study. First the study was hospital-based making it likely that we would find patients with more advanced stages of diabetes. The high prevalence of complications found among the study population may not be applicable to the general population. Second, because one of the entry criteria was access to previous medical records, the majority of the patients enrolled were being treated as outpatients in the public sector. At present there are no data on the percentage, sociodemographic characteristics, and treatment outcomes of diabetic patients being treated in the private sector in Lesotho. Future research might address whether there are any disparities in diabetes self-management and healthcare utilisation between the two groups.

In conclusion, the most common reason for hospital admission was severe hyperglycaemia. Despite good access to antidiabetic drugs, there was long-term poor glycaemic control, a high prevalence of diabetes complications and high rates of rehospitalisation among the study population. The quality of diabetes care prior to hospitalisation was suboptimal, characterised by low levels of self-care practices and inadequate screening for diabetes complications. Further studies are required to investigate barriers to implementing guidelines on diabetes care in Lesotho. Additional intervention strategies should also focus on improving patient self-management.

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References

- Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. *Diab Res Clin Pract* 2010; 87: 4-14.
- WHO. *Diabetes in the WHO African Region*. WHO statistics about diabetes. Geneva: World Health Organization, 2010.
- American Diabetes Association: Standards of Medical Care in Diabetes - 2012. *Diabetes Care* 2012; 35: S11-S63.
- MOHSW: Lesotho. Ministry of Health and Social Welfare, Annual Joint Review Report (2009/10).
- Wijesuriya MA, De-Abrew WK, Weerathunga A, et al. Association of chronic complications of type 2 diabetes with the biochemical and physical estimations in subjects attending single visit screening for complications. *J Diabetology* 2012; 1: 3.
- MOHSW, Lesotho. *Survey Report on Prevalence of Diabetes and Hypertension in Lesotho*, 2001.
- Amoah AG, Owusu SK, Adjei S. Diabetes in Ghana: a community based prevalence study in greater Accra. *Diabetes Res Clin Pract* 2002; 56: 197-205.
- Mbanya J, Sobngwi E. Diabetes microvascular and macrovascular disease in Africa. *J Cardiovasc Risk* 2003; 10: 97-102.
- Motala AA, Esterhuizen T, Gouws E, Pirie F, Omar MAK. Diabetes and other disorders of glycemia in a rural South African community: prevalence and associated risk factors. *Diabetes Care* 2008; 31: 1783-8.
- Ayele K, Tesfa B, Adebbe L, Tilahun T, Girma E. Self care behaviour among patients with diabetes in Harari, Eastern Ethiopia: the health belief model perspective. *PLoS One* 2012; 7: e33515.
- Levitt NS. Diabetes in Africa: epidemiology, management and healthcare challenges. *Heart* 2008; 94: 1376-82.
- Wabe NT, Angamo MT, Hussein S. Medication adherence in diabetes mellitus and self management practices among type-2 diabetics in Ethiopia. *N Amr J Med Sci* 2011; 3: 418-23.
- Gudina EK, Amade ST, Tesfamichael FA, Ram R. Assessment of quality of care given to diabetic patients at Jimma University Specialized Hospital diabetes follow-up clinic, Jimma, Ethiopia. *BMC Endocrine Disorders* 2011; 11: 19.
- Sobngwi E, Ndour-Mbaye M, Boateng KA, et al. Type 2 diabetes control and complications in specialised diabetes care centres of six sub-Saharan African countries: The Diabcare Africa study. *Diab Res Clin Pract* 2012; 95: 30-6.