Inpatient diabetes burden at Soba University Hospital: a snapshot survey


Department of Medicine, Faculty of Medicine, University of Khartoum & Unit of Diabetes & Endocrinology & diabetes, Department of Medicine, Soba University Hospital, Khartoum, Sudan**

Abstract

Aims
To explore the contribution of diabetes to inpatients workload at Soba University Hospital, Khartoum, Sudan.

Methods
A cross-sectional survey was conducted during a single day; 29th November 2009; data were collected from the records of all adult inpatients.

Results
The total number of adult inpatients was 139.

Corresponding author
Tarig AM Abdu FRCP, MD, MMedSci, CCST
Associate Professor, Department of Medicine, Faculty of Medicine & Consultant Physician in Endocrinology & Diabetes, Soba University Hospital, University of Khartoum, PO Box 102 Khartoum, Sudan
Email: tarabdu@yahoo.com.

Thirty percent of the total patients were known to have diabetes. The distribution of the patients with diabetes between hospital wards was: 57% in medical wards, 23% in surgical wards and 20% in obstetric wards. Patients with diabetes constituted 40% of medical inpatients, 22% of surgical inpatients, and 26% of obstetric inpatients.

The main reason for admission was diabetes related in 77% of the patients with diabetes; (36% directly related to diabetes, 41% indirectly related). In the medical wards 90% of the patients with diabetes were admitted with conditions related to diabetes.

Random blood glucose was > 11.1 mmol/L (200 mg/dL) in 46% of patients with diabetes and in 10% of patients without diabetes. There was no difference in duration of hospital stay between the two groups.
Conclusions
Patients with diabetes account for a third of inpatient hospital workload. The highest percentage was found in medical wards (41%). Crude assessment of glycemia suggests poor control in the majority of patients with diabetes. These findings call for an urgent need for improvement in diabetes care in primary as well as secondary care levels.

Keywords: Diabetes, Hospital workload, Developing countries

Introduction
The prevalence of diabetes is increasing worldwide. The International Diabetes Federation [IDF] estimates that in 2010 around 6.6% of the adult populations (285 millions) are diabetics; this is expected to increase to 7.8% (439 millions) by 2030. Low and middle income countries are among the worst to be hit by the increasing diabetes prevalence. These countries bear the brunt of the increasing diabetes prevalence and will face the greatest diabetes burden. In Sudan the prevalence of diabetes is increasing with the latest estimates suggesting a prevalence of up to 12.6%\(^1\). Other countries in Africa and the Arab World are not dissimilar; the prevalence in United Arab Emirates [UAE] is estimated at 18.7% and in Saudi Arabia at 16.8%\(^2\).

With the increasing prevalence of diabetes in the community, comes an increase in health service demands. Inpatient diabetes workload is increasing; estimates from Liverpool UK indicate an increase in prevalence of inpatient diabetes from 7% in 1991 to 11.1% in 2003\(^3\). These findings have major implications for service delivery and resource planning.

In Sudan and other low and middle income countries increasing service demands will put pressure on already very limited healthcare resources. There are no recent reports from low/middle income countries on the contribution of diabetes to inpatient workload.

Objectives
To explore the contribution of diabetes to inpatients workload at Soba University Hospital, a secondary care facility in Khartoum, Sudan.

Methods
We conducted a cross-sectional survey during November 2009. We reviewed the case records of all adult inpatients and extracted the following information: age, gender, whether a patient is known to have diabetes or not, the main diagnosis and its relation to diabetes, and the duration of hospital stay up to the time of survey.

We categorized patients according to the cause of admission into directly related and indirectly related to diabetes. The directly related group included admissions due to gestational diabetes, metabolic decompensation (Diabetic ketoacidosis, hyperglycemia, hypoglycemia), and problems related to diabetic foot or diabetic nephropathy. Admissions due to Ischaemic heart disease [IHD], cerebrovascular disease [CVA] and infections were considered as indirectly related to diabetes.

We also recorded random plasma glucose level [RPG] in a subset of patients with and patients without diabetes.

Results
The total number of adult inpatients at the time of survey was 139 patients [65 males, 74 females]. 42 [20 male, 22 female] patients i.e. 30 % of the total admissions, were known to have diabetes. The distribution of the 42 patients with diabetes between hospital wards was: 25 [57%] in medical wards, 10 [23%] in surgical wards and 7 [20% in obstetric wards]. Patients with diabetes constituted 40% of medical inpatients [25/63], 22% of surgical inpatients [10/48], and 26% of obstetric inpatients [7/28].

Details of the overall reasons for hospital admission for patients with diabetes are shown in Fig 1.
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Fig 1: Reasons for admission of patients with diabetes in all wards. [Total number of patients is 42. Others include: GI malignancy (7.14%), Ca breast (2.38%), Minor surgery (9.52%), PPF (2.38%), & infertility (2.38%).]

The main reason for admission was diabetes related in 77% of patients with diabetes; in 36% this was directly related while in 41% it was indirectly related to diabetes (Fig 2).

Fig 2: Relationship of reason for admission to diabetes in patients with diabetes in all wards. Seventy six percent of admissions were for reasons related to diabetes, 36% directly & 41% indirectly.

In the medical wards 90% of the patients with diabetes were admitted with conditions related to diabetes. Diabetic nephropathy constituted 35% of diabetes admissions to medical wards, 27% were newly discovered diabetes, while ischemic heart disease and cerebrovascular disease constituted 19% each.

Random plasma glucose [Mean ±SEM] in patients with and patients without diabetes was 11.7 ±1 mmo/L (210±18.2 mg/dl) and 6.4±0.6 mmoL (115±10.9 mg/dL) respectively [p < 0.001]. RPG was > 11.1 mmo/L (200 mg/dL) in 46% of patients with diabetes and in 10% of those without diabetes. There was no difference in duration of hospital stay [Mean ±SEM] between patients with and patients without diabetes [15.75±1.38 days vs. 15.86±1.73 days, p = 0.98].

Discussion

In this survey we found that patients with diabetes constituted around one third of the total hospital inpatients. This is much higher than the inpatient diabetes prevalence reported in UK(4). We are not aware of any reports from Sub-Saharan Africa. The high prevalence of inpatient diabetes in our hospital is a consequence of the high prevalence of diabetes in Khartoum(3). The thin infrastructure for community-based diabetes management is no doubt contributing to the quantity and quality of inpatient diabetes workload. Figures from Liverpool, UK(4) demonstrated a 4% increase in prevalence of inpatient diabetes over a 12 years period i.e. from 7% in 1991 to 11.1% in 2003. The increase in inpatient diabetes is less than would be expected from the increase in prevalence of diabetes in UK over the same period (from 2% in 1991 to 4%(5,6) in 2003). This may partly be related to improvement in community and outpatient diabetes care in UK over the same period. A survey of inpatient hospitalization of patients with diabetes in Ethiopia in 1987 found that diabetes contributed 3.5% of all hospital admissions over a six month period(7). We could not find more recent data from Sub-Saharan Africa investigating this important aspect of diabetes care.

The prevalence of diabetes in Sudan is increasing. This was demonstrated by three surveys(1,3,8). The National Diabetes Survey done in 1993 showed that prevalence of diabetes in Sudan was 3.4 % (8). The most recent national study, Sudan Household Survey (2006), estimated the prevalence of
diabetes in Sudan at 12.6% (1). In 1993 the prevalence figure for Khartoum State was 6% (8); this increased to 19.2% in 2006 (3).

In our study acute metabolic decompensation contributed 27% of admission in the medical wards. The majorities of admissions were due to chronic complications of diabetes, especially diabetic nephropathy and end stage renal disease (35%), followed by IHD and CVD. Only 10% of patients with diabetes (3 patients) in the medical wards were admitted with conditions unrelated to diabetes. This suggests poor diabetes management in the community.

The mean value for RPG among patients with diabetes was high; this may indicate poor control but as well may be a reflection of their acute illness. Haemoglobin A1c levels were not available for the majority of patients. On the other hand 10% of non-diabetic patients were found to have RPG > 11.1 mmol/L (200mg/dL); although this may be stress hyperglycemia it also may suggest a significant number of inpatients with undiagnosed diabetes.

It is notable that diabetes had no effect on the length of hospital stay; this may be related to the fact that Soba University Hospital is a referral centre that deals with complicated medical as well as surgical patients. The length of stay of 15.75 days is lower than the average of 21.3 days reported from Ethiopia in 1987 (7), but is much higher than the figure of 10.4 days reported from USA for patients with diabetes more than 30 years ago, in 1980 (9), the USA figure has improved to 4.7 days by 2006.

In conclusion, this snap shot survey shows that patients with diabetes account for a third of our hospitals’ inpatient workload. For medical wards this proportion increases to 41%. Crude assessment of glycemia suggests a prevailing poor control in the majority of patients. The increasing prevalence of diabetes in Sudan is expected to result in a further increase in inpatient workload. These findings should reflect on planning and resource allocation for inpatient and outpatient diabetes care, as well as diabetes prevention.

**Declaration of competing interest:**
Nothing to declare.

**References**


