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Short Report

Pattern and outcome of diabetic admissions at a federal medical center: A 5-year review

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Abstract

Background: Prevalence of diabetes mellitus (DM) is increasing worldwide, with the major increases expected to occur in developing countries. It has been observed that the pattern of hospital admissions can be used to determine the effectiveness of outpatient care of DM.
Objective: This study was aimed to examine diabetes-related admissions to medical wards of a federal medical center in Ekiti, Nigeria. Such data would be useful to determine the burden on health care system and in the planning of appropriate management strategies.
Methods: A 5-year retrospective analysis of diabetes-related admissions to the medical wards of Federal Medical Centre, Ido Ekiti, Ekiti State, between 2003 and 2007 was carried out using medical records of the patients. SPSS 13 software was used to analyze data.
Results: Of the total 2,696 medical admissions, 118 (4.4%) were diabetes related. The mean age of these patients was 57 ± 16.2 years. Majority (37.29%) of the patients were admitted for diabetic foot ulcer. Other major reasons for admission were severe hypertension (13.56%), uncontrolled hyperglycemia (13.56%), hyperglycemic emergencies (11.86%) and stroke (10.17%). Duration of hospital stay ranged from 1 to 107 days, with a mean duration of 17.5 ± 9.2 days. Mean duration of hospital stay was the longest (25.3 ± 23.9 days) for those admitted for diabetic foot ulcer. Most (74.6%) of the patients were discharged and only 4 (3.4%) died. Majority of those who left against medical advice were admitted for diabetic foot ulcer.
Conclusion: There is a need to emphasize foot care as one of the cardinal features of optimal diabetes care. Establishing clinics specializing in treating diabetes and having facilities for treatment of all aspects of diabetes, including diabetic complications, will help in providing better patient care and in minimizing hospital admissions.

Keywords: Admissions, diabetes mellitus, outcome

Résumé

Arrière-plan: Prévalence du diabète sucré (DM) est en augmentation dans le monde avec l'augmentation importante devrait se produire dans les pays en développement pays. Il a été observé que ce motif admissions d'hôpital peut être utilisé pour déterminer l'efficacité d'outpatients soin de DM.
Objectif: Cette étude est visant à examiner diabétiques admissions dans les services médicaux d'un médecin fédéral Centre de Ekiti, au Nigéria. Ces données seraient utiles pour déterminer le fardeau sur système de soins de santé et la planification de la stratégie de gestion a lieu.
Méthodes: Une analyse rétrospective de cinq ans des diabétiques liées admissions en la médecine Wards de Medical Centre fédéral, à l'ido Ekiti, Ekiti État entre 2003 et 2007 a été effectuée à l'aide de dossiers médicaux de la patients. Logiciel SPSS 13 a été utilisé pour analyser des données.
Résultats: Une centaine et dix-huit (4.4%) de la 2,696 total admissions médicales ont été diabétiques connexes. Leur âge moyen était de ± 57 ans 16.2. Majorité des patients ont été admis en raison de l'ulcère du pied diabétique (37.29%). Autres raisons majeures pour l'admission étaient l'hypertension sévère (13.56%), l'hyperglycémie non contrôlé (13.56%), les urgences hyperglycemic (11.86%) et contour (10.17%). Durée du séjour à l'hôpital variait entre 1 à 107 jours avec un signifie que la durée de ± 17.5 jours 9.2. Durée moyenne de séjour à l'hôpital a été plus longue dans ceux admis à l'ulcère du pied diabétique (25.3 ± 23.9). Plupart des patients (74.6%) déchargée et

seulement 4 (3.4%) étaient morts. Majorité de ceux qui ont quitté contre les conseils médicaux ont été admis pour ulcère du pied diabétique.
Conclusion: Il est nécessaire mettre l'accent sur les soins des pieds comme l'une des fonctionnalités cardinales du diabète optimale soins. Établissement cliniques diabétiques avec des installations de traitement de tous les aspects du diabète, y compris les complications diabétiques, aidera dans la fourniture de de meilleurs soins aux patients et minimisant ainsi les hospitalisations.

Mots-clés: Diabète sucré, admissions, le résultat

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Introduction

In Nigeria, the prevalence of diabetes mellitus is roughly estimated to be 2.2%, with frequencies increasing with age.[1] Throughout the world, the prevalence of type 2 diabetes has increased dramatically in the past two decades. It is estimated that the number of diabetic patients will grow from 135 million to 300 million by the year 2025.[2,3] Unfortunately, the major increases would occur in developing countries.

Hospitalization is both an adverse health event and a marker for serious health complications and is often predictive of disability.[4] Persons with diabetes are admitted to hospitals more frequently and experience longer hospital stays than nondiabetic individuals.[5] Diabetes is considered an ambulatory care-sensitive condition, and many hospitalizations are potentially preventable.[6]

There is scarcity of published data, if any, regarding pattern of hospitalization of diabetic patients in Ekiti region of Nigeria. This study was aimed to examine the presenting features of diabetes-related admissions to the medical ward of a rural medical center in Ekiti region, Nigeria. Such data would be useful to determine the burden on health care system and in planning of appropriate management strategies.

Materials and Methods

Medical records of patients admitted to the medical wards of the Federal Medical Centre, Ido Ekiti, Ekiti State, Nigeria, between 2003 and 2007 for diabetes mellitus and/or diabetes-related problems were retrieved from the Medical Information and Records Department of the hospital and analyzed. Data extracted from the case records included personal data, diagnosis, serum creatinine results, duration of stay in the hospital and outcome. Data were expressed as mean ± standard deviation (SD), and frequency was expressed as a percentage. Computation of P values was done by t test and chi-squared analysis. $P < 0.05$ was considered statistically significant. All statistical analyses were performed with commercially available computer program SPSS 13.

Results

A total of 2,696 patients were admitted to the medical wards over the 5-year period. Out of these total admissions, 1,509 (55.9%) patients were males and 1,187 (44.1%) were females. Diabetes mellitus accounted for 118 (4.4%) of these admissions, out of which 71 (61%) patients were males and 46 (39%) were females. The mean age of the patients was 57 ± 16.2 years (range, 18-96 years). Females were significantly older than males (61 ± 11.9 years *vs.* 55 ± 18.1 years; $P = 0.049$). Mean duration for which the patients had diabetes was 48.44 ± 30.02 months. The frequency of diabetes mellitus coexisting with hypertension was 49.2%.

Diabetes mellitus-related indications for admission

The diabetes mellitus-related indications for admission are shown in Table 1. It was observed that major indications for admission were diabetic foot ulcer (37.29%), severe hypertension (13.56%), uncontrolled hyperglycemia (13.56%) and hyperglycemic emergencies (11.86%). Though only 3.4% of the patients were admitted for nephropathy, 25.7% had serum creatinine greater than 132 μmol/L. Other indications were visual impairments that were later diagnosed as cataract, and these accounted for 1.7% of the admissions.

Table 1: Indications for admission

Indication	Number	% of total
Diabetic foot ulcer	44	37.29
Stroke	12	10.17
Nephropathy	4	3.40
Uncontrolled hyperglycemia	16	13.56
Sepsis	10	8.46
Severe hypertension	16	13.56
Hyperglycemic emergencies	14	11.86
Others	2	1.70

Length of hospital stay and outcome of hospitalization

Duration of hospital stay ranged from 1 to 107 days, with a mean duration of 17.5 ± 9.2 days. Mean duration of hospital stay was the longest for those admitted for diabetic foot ulcer (25.3 ± 23.9 days) [Table 2]. As shown in Table 3, a total of 88 (74.55%) patients were treated and discharged. There were 26 (22.05%) patients who left against medical advice, and they did so after they had been hospitalized for a period between 2 and 40 days (mean, 12 days); majority (14 [53.8%]) of these patients were admitted for diabetic foot ulcer. Mortality by indication for admission is shown in Table 4. There were 4 deaths, accounting for a mortality rate of 3.4%. These deaths occurred within 6 days of admission in males older than 70 years. Mortality rate in patients admitted for stroke and hyperglycemic emergencies was 1.7% each.

Discussion

The burden on the resources of society brought about by the complications of diabetes mellitus is enormous and costly. These diabetic complications often result in patients' admissions to the hospital.[5] These hospitalizations have been found to be both adverse health events and markers for serious health complications and are often predictive of disability.[4] It is surprising that only a few reports have been published regarding the diabetes-related admissions and the tremendous costs of inpatient care to the patients of diabetes. In this study, we have described the reasons for, and outcomes of, hospitalizations of diabetic patients seen in a rural health facility in Ekiti, Nigeria.

This study indicates that 4.4% of the total admissions to the medical ward were related to diabetes and/or its complications. This proportion of diabetes-related admissions is higher than that reported[7] from Tanzania (1%), South Africa (1.5%) and previously from Nigeria (3.5%). One recent study from an urban teaching hospital in Nigeria put diabetes-related admissions in that center at 15%.[8] This may be a reflection of the increasing incidence of diabetes and its complications in this urban region as compared with our study from a rural center.

Hypertension was present in 49.2% of the patients. Hypertension is a major cardiovascular risk factor, and the prevalence of hypertension in diabetic patients is considerably higher than in the general population. It has been reported that overall, 40% to 50% of diabetic patients are hypertensive when compared with nondiabetic population.[9]

It was observed that the mean duration of hospital stay was 17.5 ± 9.2 days. In a study from Riyadh,[10] the mean duration of diabetes-related hospital stay was 10 days. In studies from Denmark,[11]

Table 2: Length of hospital stay

Indication for admission	Duration of hospital stay (days)
Diabetic foot ulcer	25.27 ± 23.90
Stroke	14.50 ± 7.10
Nephropathy	13.50 ± 8.60
Uncontrolled hyperglycemia	16.10 ± 9.10
Sepsis	7.80 ± 2.00
Severe hypertension	8.70 ± 5.50
Hyperglycemic emergencies	17.60 ± 28.10
Others	3.00 ± 0.01

Table 3: Outcome of hospitalization

Indication for admission	Outcome		
	Discharge n(%)	LAMA* n(%)	Death n(%)
Diabetic foot ulcer	30(25.41)	14(11.86)	0(0.00)
Stroke	10(8.46)	0(0.00)	2(1.70)
Nephropathy	2(1.70)	2(1.70)	0(0.00)
Uncontrolled hyperglycemia	14(11.86)	2(1.70)	0(0.00)
Sepsis	4(3.40)	6(5.09)	0(0.00)
Severe hypertension	16(13.56)	0(0.00)	0(0.00)
Hyperglycemic emergencies	10(8.46)	2(1.70)	2(1.70)
Others	2(1.70)	0(0.00)	0(0.00)
Total *n*(%)	88(74.55)	26(22.05)	4(3.40)

*LAMA - Left against medical advice

Table 4: Mortality by indication for admission

Indication for admission	Total	Number of deaths	% of total	Outcome		
				Discharge n(%)	LAMA* n(%)	Death n(%)
Diabetic foot ulcer	44	0	0.00	30(25.41)	14(11.86)	0(0.00)
Stroke	12	2	1.70	10(8.46)	0(0.00)	2(1.70)
Nephropathy	4	0	0.00	2(1.70)	2(1.70)	0(0.00)
Uncontrolled hyperglycemia	16	0	0.00	14(11.86)	2(1.70)	0(0.00)
Sepsis	10	0	0.00	4(3.40)	6(5.09)	0(0.00)
Severe hypertension	16	0	0.00	16(13.56)	0(0.00)	0(0.00)
Hyperglycemic emergencies	14	2	1.70	10(8.46)	2(1.70)	2(1.70)
Others	2	0	0.00	2(1.70)	0(0.00)	0(0.00)
Total n(%)				88(74.55)	26(22.05)	4(3.40)

Tanzania[12] and previously from Nigeria,[7] the mean duration of hospital stay was 8.4, 21 and 23.6 days, respectively. This variation might be related to differences in hospital facilities, severity of illness and availability of outpatient supportive care. Diabetic foot ulcer required the most prolonged duration of hospital stay in this study. This is similar to what was reported in studies from an urban teaching hospital in the Lagos metropolis of Nigeria.[8]

Diabetic foot ulcer accounted for majority (37%) of the diabetes-related admissions, which is similar to what has been reported in other studies,[13] though at a higher magnitude. This could be a reflection of inadequate education on diabetic foot care. Physicians have an important role in the prevention, early diagnosis and management of diabetic foot complications. The physician should do risk assessment in order to determine early the presence of risk to the foot. Poor control of diabetes accounted for 14% of the admissions, while hyperglycemic emergencies were the reason for admission in 12% of cases. As compared to other studies,[14] the frequency of admissions due to uncontrolled diabetes was lesser in the current study. This indicates the changing pattern of diabetes-related admissions to the hospital — that more patients are being admitted with long-term complications of diabetes rather than acute metabolic complications. Uncontrolled diabetes was the commonest reason for admission as reported in studies from northeastern Libya,[14] where 58% of admissions were due to this reason alone.

Although only 3% of the patients were admitted for nephropathy, yet compromised renal function was present in 25.7% of the patients.

In-hospital mortality of 3.4% among diabetic patients was lower than that reported by Roaeid[14] (18%). Other studies[15] have described in-hospital mortality rates ranging from 8% to 9% among diabetic patients. The high frequency of patients leaving the hospital against medical advice may account for this seemingly low mortality.

The high prevalence of diabetic complications poses a serious public health problem, especially in our setup, where health care resources are limited. Efforts should focus on identification of risk factors in order to prevent lengthy, recurrent and avoidable hospitalizations of patients with diabetes mellitus. It is important to emphasize optimal glycemic control in the outpatient management of diabetic patients since randomized, controlled trials have provided compelling evidence that diabetic microangiopathy and neuropathy can be reduced by tight glycemic control,[16,17] and this will also exert a favorable influence on macrovascular complications.[18] There is a need to emphasize foot care as one of the cardinal features of optimal diabetes care. Establishing clinics specializing in treating diabetes and having facilities for treatment of all aspects of diabetes, including diabetic complications, will help in providing better patient care and in minimizing hospital admissions.

Though the number of cases in the study was small, the pattern of hospitalization could be analyzed. The limitation of the study was that admissions to the medical ward only were included, which is an underestimation of the diabetes-related admissions to the hospital, as patients with diabetes are also routinely admitted to other departments of the hospital.

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