

Original article

Analysis of diabetic patients admitted to Tikur Anbessa Hospital over eight years period

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Abstract: A retrospective analysis of all diabetic admissions to the adult medical wards of Tikur Anbessa Hospital (TAH) over a period of eight years from 1987 to 1994 was done. There were a total of 7739 medical admissions. Out of these, there were 736(9.5%) diabetic admissions. The records of 553 (75.1%) diabetic admissions were retrieved and analyzed. There were 453 patients with 553 episodes of admissions. Of these, 381 patients were admitted once, 55 patients twice, and 17 patients three or more times. The mean age was 42.3 ± 17.7 years and there were 323 males (58.4%) and 230 females (41.6%). Two hundred eighty three (51.2%) were Insulin Dependent Diabetes Mellitus (IDDM) and 270 (48.8%) were Non-Insulin Dependent Diabetes Mellitus (NIDDM) patients. The median duration of hospital stay was 18 days. There was no difference in hospital stay between IDDM and NIDDM patients ($p > 0.05$). The overall mean duration of diabetes mellitus was 7.9 ± 7.1 years. The mean duration of diabetes mellitus was significantly lower in IDDM as compared to NIDDM patients (5.7 ± 5.2 years versus 10.2 ± 7.2 years; $X^2 = 54.7$; $p < 0.001$). The causes of admissions were infection (26.9%), poor metabolic control (19.3%), acute complications of diabetes (19.3%), and chronic complications of diabetes and its sequelae (17.5%). The overall mortality rate was 15.9%. The causes of death were infection in 30.7%, diabetic ketoacidosis in 18.2%, renal failure in 15.9%, stroke in 12.5%, liver disease in 10.2%, and myocardial infraction in 3.4%. It is noted that significant percentages of admissions and deaths were preventable. We recommend the implementation of the national diabetes program, intensification of diabetes education, tight metabolic control, and adequate provision and procurement of drug supply in order to prevent and reduce the mortality and morbidity of diabetic patients. [*Ethiop. J. Health Dev.* 1999;13(1):9-13]

Introduction

Diabetes is the most common endocrine metabolic disorder that affects an estimated 100-200 million people worldwide and the incidence of new cases is rapidly increasing (1). It is a chronic, often debilitating disease with severe complications, including heart and kidney diseases, neuropathy and blindness. Repeated hospitalizations are common phenomena in diabetic patients. Diabetic patients inevitably develop either the acute complications or the awful chronic complications, which are bound to cause repeated admissions in the life of a diabetic patient. In Northern America, diabetic patients account for 7.2% and in Rio de Janeiro, Brazil, for 7.9% of total admissions (2,3). In Ethiopia, different studies have shown that diabetes accounts for 1.7-4% of all medical admissions (4-8). Many of the reasons of admissions and causes of death as seen from other parts of Africa (9,10) are preventable. Adequate and strong preventive measures should be taken to avoid preventable and unnecessary admissions and deaths. The main objective of this study was to identify the most common causes of diabetic admissions and to assess the outcome of diabetic patients admitted to our hospital and thereby to come up with recommendations of preventive intervention.

deaths in a tertiary hospital will be interesting. The hospital has 480 beds, one quarter of which is for medical admissions. Each chart was examined carefully for the age, sex, hospital stay, type of diabetes, cause of admission, presence of complications, and outcomes of hospitalization. The necessary information was recorded on a protocol prepared for this purpose. Information was collected from the hospital statistics unit, the ward registration book, discharge summary, and death summary for maximal retrieval and ascertainment of the patients charts.

Data were entered and analyzed using the EPI Info version 6 statistical package and chi-square test was used for statistical analysis.

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Methods

The authors made a retrospective search of charts of all diabetic patients admitted to the adult medical words of TAH over a period of eight years from 1987-1994. A period of eight years was chosen, because the charts available were only as of 1987. TAH was chosen for the study, as it is one of the main referral and teaching hospitals of the country. To study the causes of admission and

Results

There were a total of 7739 medical admissions during the study period. Of these, 736(9.5%) admissions were for diabetic patients. Because of the poor record keeping of the hospital we were able to retrieve and analyze the records of 553(75.1%) admissions only. Every effort was made to retrieve the missed charts; however, it was not possible to get them. During the eight years period, there were a total of 453 diabetic patients admitted to the hospital with 553 episodes of admissions. Of these, 381(84.1%) patients were admitted once; 55(12.1%) twice; 13(2.9%) three time; three patients five times, and one patient eight times. Males constituted 58.4% and females

Table 1: **Reasons for admission amongst 553 diabetic patients admitted to TAH over a period of 8 years.**

Cause of admission				
I. Infection	71	78	149	26.9
- Skin and subcutaneous infection	23	27	50	
- Pulmonary tuberculosis	26	10	36	
- Pneumonia	7	18	25	
- Urinary tract infection	7	9	16	
- Typhoid/Typhus fever	2	3	5	
- Malaria	0	5	5	
- Meningitis	1	3	4	
- Others	5	3	8	
II. Acute complications of diabetes mellitus	101	6	107	19.3
- Diabetic Ketoacidosis	97	4	101	
- Hypoglycaemia	4	1	5	
- Nonketotic hyperosmolar coma	0	1	1	
III. Poor metabolic control	76	31	107	19.3
IV. Chronic complications of diabetes mellitus	23	74	97	17.5
- Renal failure	5	22	27	
- Gangrene & foot ulcer	10	16	26	
- Cerebrovascular accident	4	18	22	
- Ischemic heart disease	2	18	20	
- Gstoparesis	2	0	2	
V. Gastrointestinal disease	21	30	51	9.2
- Liver disease	2	16	18	
- Dyspepsia	10	7	17	
- Gastroenteritis	6	7	13	
- Malabsorption	3	0	3	
VI. Cardiomyopathies & Rheumatic heart disease	0	12	12	2.2

VII. Neurologic diseases	3	9	12	2.2
VIII. Malignancies	0	4	4	0.7
IX. Others	1	13	14	2.5

Table 2: Causes of death in 88 diabetic patients admitted to TAH over a period of 8 years (1987-1994)

Causes of Death	Type I	Type II	Total	%
Infection	9	18	27	30.7
DKA	14	2	16	18.2
Renal failure	4	10	14	15.9
Stroke	3	8	11	12.5
Liver disease	1	8	9	10.2
Myocardial				
Infection	0	3	3	3.4
Others	2	6	8	9.1
Total	33	55	88	100

41.6% of the diabetic admissions. The mean age was 42.2 ± 17.7 years (range 14-87 years). There were 283(51.2%) IDDM and 270(48.8%) NIDDM patients. The mean duration of hospital stay was $22.5 \pm 21/3$ days (range 1-272 days), 23.7 days for IDDM and 21.2 days for NIDDM; however, this difference was not statistically significant ($P > 0.05$). The overall mean duration of diabetes mellitus was 7.9 ± 6.6 years (range 0-37 years); it is significantly higher in NIDDM patients as compared to IDDM patients (10.2 years versus 5.7 years, $X^2 = 54.7$, $P < 0.001$). The leading cause of admission was infection 149(26.9%) followed by acute complications of diabetes mellitus for 107(19.3%), poor metabolic control for 107(19.3%), and chronic complication of diabetes for 97(17.5%) patients. The rest of the admissions were secondary to gastrointestinal diseases 51(9.2%); cardiomyopathies, rheumatic heart diseases, and neurologic diseases 12(2.2%) each; and malignancies 4(0.7%). These admissions were not directly related to diabetes (Table 1).

The overall mortality rate was 15.9%. The main causes of death were infection and acute complication of diabetes mellitus (Table 2). The mean age and the mean duration of diabetes at death were 48.5 ± 7.7 years and 8.3 ± 5.1 years, respectively.

Table 3: Comparisons of reported causes of mortality among diabetic patients in different countries

Country year of study	USA ¹¹ 1976	Nigeria ¹⁴ 1976	Uganda ¹⁵ 1966	Tanzania ¹⁶ 1992	Ethiopia ¹⁷ 1984	Present study
Total deaths	5009	42	54	126	100	88
Cause of death	percentage of total deaths					
Diabetic coma	1	43	54	19.6	10	18.2
Vascular diseases	76.6	7	2	12.7	14	15.9
Renal diseases	8.9	7	-	-	26	15.9
Non-tuberculoses infection	5.4	3.3	13	20.6	10	25.0
Tuberculosis	0.1	2	9	10.3	4	5.7
All other causes	8	8	22	35.7	16	19.3

Discussion

The study reveals that diabetic patients constitute about 9.5% of the total medical in-patients in the country's single major referral and teaching hospital. Although not in the referral hospital, the number of diabetic admissions has increased from 1.7-4% (4,8) in the previous years to 9.5% in this study. This picture clearly indicates that diabetes is on the rise as is seen in every corner of the world (1). The peak age of admission was different in IDDM and NIDDM patients, being in the range of 25-35 years in the former and 50-60

years in the latter. The commonest modes of presentation in this study were infection, acute complications of diabetes mellitus, and poor metabolic control. In similar reports from South America and Africa (3,9,10), the leading causes of admission were acute complications of diabetes mellitus, mainly related to diabetic ketoacidosis, whereas in the developed countries like USA (11), chronic complications were the main causes. However, we still see these chronic complications as causes for admission, particularly in NIDDM patients. About 90% of the patients presented with ischaemic heart disease, renal failure, and stroke were NIDDM patients, whereas almost all patients who presented with acute complications were IDDM patients.

Before the advent of insulin and in the early years after the discovery of insulin, the acute metabolic disorders of diabetes (ketoacidosis and non-ketotic hyperosmolar diabetic coma) were the main causes of death in diabetic patients (12). This trend is still continuing in developing countries. However, in developed countries, deaths due to these complications are rare and uncommon. On the other hand cardiovascular diseases are becoming the main causes of death (11,13). Our findings showed that the leading causes of death were infections and diabetic ketoacidosis, particularly in IDDM patient. These are preventable conditions which are quite similar to that of the pre-insulin era. Similarly, most diabetic deaths in Nigeria, Uganda, Tanzania, and in Ethiopia from a report before 10 years were from preventable causes (14-17) (Table 3). In all these countries, the reports were from the country's major cities where better diabetic services are available. In most parts of these countries, prognosis must be considered worse. The need for improved diabetic care is obvious. One of the main causes for the development of diabetic ketoacidosis particularly in the developing countries like Africa is lack of insulin which is a serious problem in most sub-Saharan African countries. The problem is unlikely to improve in the foreseeable future (18) because it is complicated with lack of adequate budget, distribution problems, and ignorance.

On the other hand vascular complications like stroke and myocardial infarction are coming into the picture. Unlike the previous reports (19), renal failure is as well becoming one of the main causes of death. In developing countries where there is no facility to help patients in renal failure, the result is almost death when diabetics develop nephropathy in these countries.

The majority of the admissions and deaths in the inpatient department of Tikur Anbessa hospital could have been prevented had there been a national diabetes care program, whereby an organized diabetes care is provided at different health care levels. It has been clearly shown that structured patient education programs in the different health care levels can significantly reduce the need for hospitalization of patients with diabetes mellitus by more than 50% (20). Similarly the implementation of the national diabetes program involving different health care levels throughout the country, can reduce preventable admissions and deaths, and thereby also save a significant proportion of the meager national budget.

Tragically, like in other third world countries, diabetic patients are still threatened by the lethal but preventable metabolic problems of the pre-insulin era.

In conclusion, as many of the admissions and deaths were preventable, we recommend adequate supply and provision of insulin throughout the country and the implementation of the national diabetes program which consists of structured health education, tight metabolic control, and proper referral system; with these programs, the preventable diabetic admissions and deaths can be significantly reduced.

Acknowledgments

We are thankful to Dr. Mesfin Kassaye for his comments and Weizero Fantaye Takele for typing the manuscript.

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