

DIABETIC ADMISSIONS IN THE MEDICAL WARDS OF ABIA STATE UNIVERSITY TEACHING HOSPITAL, ABA, SOUTH EAST, NIGERA: A 10- YEAR REVIEW.

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ABSTRACT

Complications of diabetes mellitus (DM) can be acute or chronic. These DM related complications are, often, indications for admissions in the medical wards. Published literature on outcome of diabetes admissions in Aba, South east Nigeria is scanty. The objective of this study, therefore, is to determine the profile of diabetes related complications and their treatment outcome in the medical wards of Abia State University Teaching Hospital (ABSUTH), Aba. This was a 10-year retrospective descriptive study in which data was extracted from the Admission/Discharge registers in the medical wards of ABSUTH, Aba from May 1, 2007 to April 30, 2017. Relevant data obtained were analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 software. A total of 6587 admissions were seen within the study period; 1220 (18.5%) were admitted because of DM related complications, made up of 599 (49%) males and 621 (51%) females. Uncontrolled DM was the commonest indication for admission and the least was hypoglycaemia. Mortality among the diabetic admissions was 20.4% and the longest duration of hospitalization was by diabetic foot/hand ulcers. Diabetes mellitus contributes significantly to medical admissions in Aba, Nigeria, thus, the need for improvement in diabetes care and support.

Keywords: Diabetic admissions, pattern, outcome, medical wards, southeast Nigeria

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease characterized by chronic hyperglycaemia due to reduced insulin secretion by the beta cells of the pancreas, decreased glucose utilization by the target tissues and increased hepatic glucose production (Alvis, 2010). Diabetes mellitus is a leading cause of death worldwide and occurs in an epidemic proportion in the developing countries (Brownlee *et al.*, 2008 and Rheeeder, 2006). The prevalence of DM is on the increase (Sogwi, 2011), more so, in sub Saharan Africans (Chinenye *et al.*, 2013) due to ageing of the population, improving survival of people living with diabetes, obesity, increased urbanization and westernization, dietary changes and physical inactivity. Diabetes mellitus is projected by the WHO to rise to 552 million people world-wide by 2030 but it currently affects 371 million people in the world with about 5 million affected Nigerians (International Diabetes Federation, 2010).

Diabetes mellitus is associated with microvascular (affecting the eyes, kidneys and the nerves) and

macrovascular complications (George, Alberti and Zimmet, 2011). Glycaemic control in persons living with diabetes plays a significant role in the development and progression of microvascular complications of diabetes (Rohlfing, 2002 and WHO, 2011). People living with diabetes are predisposed to cardiovascular diseases, end stage renal disease (ESRD), lower extremity amputation and adult blindness (Masharani, Karan and German, 2007). Complications of DM can be acute or chronic (Kitabchi and Nyenwe, 2011). Acute complications of DM (Brownlee *et al.*, 2008) are frequent and can be metabolic (hypoglycaemia and the hyperglycaemic emergencies) or nonmetabolic which includes severe infections such as sepsis, malignant otitis externa, necrotizing cholecystitis etc.

In tertiary hospital based studies in Southern Nigeria (Ajayi and Ajayi, 2009; Umoh *et al.*, 2012), the most common DM complications leading to hospitalization were hyperosmolar hyperglycaemic state (HHS), diabetic ketoacidosis (DKA) and diabetic foot ulcers while in other studies in Lagos (Ogbera *et al.*, 2007) and the Niger Delta region (Unachukwu *et al.*, 2008) of





Nigeria, hyperglycaemic emergencies were the commonest cause of death among diabetic in-patients at 40% and 40.1% respectively. In another tertiary hospital based study in South East Nigeria (Nkpozi *et al.*, 2019) noted that DM related complications constituted 19.15% of all the medical admissions within the study period and that hyperglycaemic emergencies (HE) were the commonest DM related complications necessitating medical ward admissions.

In the same study, HE contributed 83% to all DM admissions. Similarly, in another tertiary hospital based study in NorthWest, Nigeria, the main indications (Uloko *et al.*, 2013) for diabetes hospital admissions, in decreasing order, were sepsis (30.9%), HHS (14.2%), DKA (7.4%), diabetic foot ulcers (7.4%) and cerebrovascular accidents/stroke.

In the commercial city of Aba, South East Nigeria where this study was carried out, there is a paucity of published studies on the pattern and treatment outcome of DM hospital admissions. This study, therefore, set out to bridge that gap in knowledge by assessing the frequency and outcome of treatment of DM related complications at the medical wards of Abia State University Teaching Hospital (ABSUTH), Aba, Abia state.

MATERIALS AND METHODS

Study Design: This was a retrospective descriptive study carried out on records of all patients admitted with a diagnosis of DM related complications into the male and female medical wards of the Department of Internal Medicine, ABSUTH, Aba. Aba is a commercial city in the South East region of Nigeria known for her industrial, mercantile and craftwork activities. The hospital is the only tertiary health facility in Aba; she gets referrals from all the primary and secondary health facilities in Aba and the neighbouring states. The study covered a period of ten years between May 1, 2007 and April 30, 2017.

Study Population: Using the Nurse's Inpatient Admissions/Discharge Registers in the male and female medical wards, nurses report books, Death certificates and in some cases, case notes of some patients from the Medical Records Department of the hospital, 6587 admissions were recorded in the medical wards. Out of

this, the patients admitted with DM related complications in the medical wards aged 15 years and more were recruited. Patients whose data were incomplete were excluded and all the diagnoses were based on the final diagnoses made by the supervising consultants. These diagnoses were arrived at on combination of clinical and laboratory parameters of the patients. Duration of hospital stay of 1 day refers to patients in whom the outcome of admission occurred within 24 hours of admission in the medical wards.

Data Collection: The following data were collected from each patient's record – age, gender, definitive diagnosis, duration of hospital stay and outcome during admission. In this study, the outcome measures were improved and discharged home, died, discharged against medical advice (DAMA) or transferred to another specialty outside the medical wards or to another health facility.

Ethical Consideration: Ethical approval was obtained from the Institution's Ethics and Research Committee before commencing the study.

Data Analysis: Data obtained were analyzed using the Statistical Package for Social Sciences (SPSS Inc. Chicago IL) version 20.0 software. The qualitative data were expressed as frequencies and percentages while the quantitative data were summarized as means and standard deviations. P values of <0.05 was regarded as statistically significant.

RESULTS: A total of 1220 (18.5%) patients were admitted because of DM related complications, made up of 599 (49.1%) males and 621 (50.9%) females. The difference between the number of males and females with DM related complications is statistically significant ($X^2 = 29.78$, $p = 0.001$). The major causes of diabetic admissions in the medical wards of ABSUTH were uncontrolled DM (48.8%), diabetic foot/hand ulcers (18.03%), hyperglycaemic emergencies (HHS and DKA) at 13.6% and DM coexisting with hypertension (13.4%). Diabetes mellitus foot/ hand ulcers with or without gangrene was seen more among the males and caused the longest duration of hospital stay. Hypoglycaemia was rare among the diabetic admissions. Other details are shown in table 1.



Table 1: Frequency of DM related complications and their hospitalization durations.

	Males	Females	Frequency(%)	Mean DHS(±SD) days
Uncontrolled DM	268	327	595(48.8%)	10.86(±8.88)
HHS	56	46	102(8.4%)	8.66(±7.39)
DKA	24	39	63(5.2%)	8.29(±7.52)
DMFS/hand ulcer	130	90	220(18.03%)	25.04(±23.10)
Hypoglycaemia	4	7	11(0.9%)	9.27(±8.09)
DM/HTN	74	90	164(13.4%)	9.98(±7.69)
DM/stroke	43	22	65(5.3%)	9.83(±9.34)
Others	2554	2813	5367	9.33(±8.49)
Total	599	621	1220(100%)	

Key: HHS = hyperglycaemic hyperosmolar state, DKA = diabetic ketoacidosis, DMFS = diabetes mellitus foot/hand ulcers ± gangrene, DM/HTN = diabetes mellitus with hypertension co-morbidity, DM/stroke = diabetes mellitus complicated by stroke, DHS = duration of hospital stay

The mortality rate in this study was 20.4% and the commonest causes of diabetic death were uncontrolled DM, hyperglycaemic emergencies and diabetes mellitus foot/ hand ulcers with or without gangrene with case fatality rates of 36.5%, 22.1% and 17.7% respectively. Referral to other centres or speciality and DAMA were predominant among

persons admitted for diabetic foot/hand ulcers. The difference in the outcomes of the DM related complications admitted in the medical wards of ABSUTH within the period under review is statistically significant ($X^2 = 163.508, p = 0.001$). . Other details are in table 2.

Table 2: Outcome of treatment of the DM admissions

Outcome	Un DM	HHS	DKA	DMFS	Hypog	DM/HTN	DM/stroke	Frequency(%)
Improved	489	69	36	146	10	138	28	916(75.1%)
Died	91	30	25	44	1	23	35	249(20.4%)
DAMA	11	3	1	25	0	3	2	45(3.7%)
Referred	4	0	1	5	0	0	0	10(0.8%)
Total	595	102	63	220	11	164	65	1220(100%)

Key: Un DM = uncontrolled diabetes mellitus, Hypog = hypoglycaemia, DAMA = discharge against medical advice

DISCUSSION

In this study, the finding that DM related complications accounted for 18.5% of all medical admissions within the period under review is comparable to the 19.15% noted in Umuahia (Nkpozi *et al.*, 2019), both findings are higher than what was obtained in Ilorin (Chijioke *et al.*, 2010), Ido Ekiti (Ajayi and Ajayi, 2009) and Lagos (Ogbera *et al.*, 2007) where diabetic admissions constituted 5.2%. 4.4% and 15% respectively of all

medical admissions within the study periods. This finding in the index study is similar to the Umuahia report probably because both cities are in the same state of South East region of Nigeria with similarity in healthcare policy, health services and health seeking behaviours. The reason for the greater diabetic admissions in this more recent study could, probably, be in keeping with projected increasing prevalence of type 2 DM from obesity, sedentary lifestyles, increased urbanization and westernization of diets (Sogwi, 2011).



The commonest diabetic indications for admission in the medical wards in this study were uncontrolled DM and diabetic foot/hand ulcers unlike in the Umuahia (Nkpozi *et al.*, 2019) study where HEs were clearly the major diabetic indication for medical admissions. The increased diabetic foot/hand ulcer in this study could be a consequence of the high rate of uncontrolled DM noted in the study. Poor glycaemic control as an indication for hospitalization could be because of a weak diabetes care system, inadequate diabetes/health education programmes or because the present study spanned over a 10- year period with much larger study population unlike the Umuahia study that lasted less than 6 months. HEs topped the diabetic admissions list in Umuahia because the Umuahia study included all cases of HEs in all sections of the hospital including surgical wards, obstetrics/gynaecology wards, Intensive Care Unit etc while the present study concentrated on subjects admitted in the medical wards only.

The present study, however, is comparable to the study (Azinge and Anizor, 2013) in the South-South Nigeria where DM admissions accounted for 16.1% of all medical admissions and the causes of DM related admissions were uncontrolled DM (39.2%), diabetes mellitus foot syndrome (38.6%), HEs (15.7%) and hypoglycaemia (6.5%). In the study (Ajayi and Ajayi, 2009), mean duration of hospital stay was the longest (25.3 ± 23.9 days) for those admitted for diabetic foot ulcer just as in the index study.

The explanation why diabetes mellitus foot/ hand ulcers with or without gangrene was seen more among the males in the present study is not clear but may have to do with the male gender's roles as the breadwinner of the family despite their diabetes status. Hospitalization duration was longest with patients that had diabetes mellitus foot/ hand ulcers with or without gangrene for the obvious reasons that some of them needed wound debridement and even limb amputation which were associated with prolonged period of wound care. The implication of this prolonged duration of hospital stay for patients with diabetes mellitus foot/ hand ulcers with or without gangrene is loss of man-hour in hospitals, poverty, lack of resources for future diabetes care and premature death. Similar to other

Nigerian studies (Ajayi and Ajayi, 2009; Umoh *et al.*, 2012; Ogbera *et al.*, 2007 and Unachukwu *et al.*, 2008) on diabetic admissions in the medical wards, hypoglycaemia was found in this study to be neither a significant cause of hospitalization nor an important contributor to mortality.

An overall mortality rate of 20.4% in this study is higher than the 17.2% case fatality reported in Portharcourt (Unachukwu *et al.*, 2008) where the main causes of death were diabetic keto-acidosis (21.2%), diabetes mellitus foot syndrome (10.5%) and renal failure (12.7%). It was, also, higher than the overall mortality rate of 8.1% noted in Uyo (Unadike *et al.*, 2013) where the commonest cause of death was HHS (24.2%) and the 3.4% reported (Ajayi and Ajayi, 2009). It is important to note that despite differences in mortality rates, the findings in the index study is comparable to that by (Ajayi and Ajayi, 2009) where the major indications for hospitalization were diabetic foot ulcer (37.29%), severe hypertension (13.56%), uncontrolled hyperglycaemia (13.56%), hyperglycaemic emergencies (11.86%) and stroke (10.17%). Reasons for disparities in the mortalities noted in all these Nigerian studies is not clear but may not be unconnected with differences in prevalence of DM, health education, healthcare policies and available diabetes care services and supports.

Finally, diabetic foot/hand ulcer with or without gangrene being the commonest cause of DAMA and a DAMA rate of 3.7% in the index study is comparable to the findings in the report in Ekiti state (Ajayi and Ajayi, 2009), South west region of Nigeria. This similarity in findings in different regions of Nigeria could be due to illiteracy, cultural and superstitious beliefs of the persons resident in the regions. Improvement and discharge home (75.1%) in this study is similar to the treatment outcome in other Nigerian studies (Ajayi and Ajayi, 2009; Umoh *et al.*, 2012; Ogbera *et al.*, 2007 and Unachukwu *et al.*, 2008). The implication is that there is a need for improvement in the nation's healthcare delivery services.

Conclusion/Recommendations

This study has shown that DM is an important cause of medical admissions in ABSUTH, Aba with a significant mortality. Uncontrolled DM,



diabetes foot/hand ulcers, HEs and DM coexisting with hypertension were the major DM related complications resulting to hospitalization. There is need for improvement in all aspects of both preventive and curative care of persons living with diabetes.

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CONFLICTS OF INTEREST – Nil

AUTHOR'S CONTRIBUTIONS:

1. Dr Marcellinus O. Nkpozi - Conception and design of the research with drafting of the manuscript. He, also, takes overall responsibility for the study.
2. Dr Assumpta U. Chapp Jumbo - Collection of the data; analysis, interpretation of the data and statistical analysis.
3. Dr Benjamin U. Adukwu - Final approval and critical revision of the manuscript

