

## PATTERN AND OUTCOME OF MEDICAL ADMISSIONS IN A TEACHING HOSPITAL IN THE SOUTH EAST REGION OF NIGERIA

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### ABSTRACT

**Background and Objective:** Medical admissions in hospitals located within a certain region reflect the diseases burden in that region. The objective of this study is to determine the profile of diseases and their treatment outcome in the medical wards of the Department of Internal Medicine, Abia State University Teaching Hospital (ABSUTH), Aba, South East, Nigeria.

**Materials and Methods:** This was a 10-year retrospective descriptive study in which data was extracted from the Admission/Discharge registers in the male and female 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.

**Results:** A total of 6587 admissions made up of 3153 (47.9%) males and 3434 (52.1%) females were seen with a mean age of 52.34 years. The elderly topped the list of the medical admissions followed by the middle aged group. Non-communicable diseases, NCDs, (73%) caused more medical admission than communicable diseases, CDs, (27%). The overall commonest causes of death in the medical wards were stroke and human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS). Stroke, diabetes mellitus (DM) related complications, heart failures and chronic kidney diseases (CKD) were the commonest causes of death among the NCDs. While mortality of the medical admissions was 22.6%, 69.4% improved and were discharged home. Mean duration of hospital stay for the medical admissions was 9.97 days and the longest was by diabetic foot/hand ulcer.

**Conclusion:** The female gender and the elderly population were admitted more in the medical wards while NCDs caused more medical admissions and deaths than the CDs. Stroke followed by HIV/AIDS were the commonest overall causes of deaths in the medical wards within the study period.

**Key words:** medical admissions–diseases pattern–admission outcome–communicable and non-communicable diseases–South East–Nigeria

### 1 INTRODUCTION

Tertiary health institutions offer services to patients that are self-referred or those referred by primary, secondary and

other tertiary health facilities depending on the available facilities and skilled manpower. Hospital admission patterns give an insight into the disease burden in a particular region and assists in health care planning and performance evaluations of a hospital. Medical admissions are important as a reflection of common diseases in the society [1, 2] . It

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is worthy of note that medical diseases constitute the most common cause of death in adults [3]. The pattern of medical admissions varies from one health facility to another depending on the prevailing medical diseases in the region, education, hygiene, lifestyle and health-seeking behaviors of the population vis-a-vis available health services.

However, hospital based studies cannot replace population based studies which are the gold standard for determining the incidence, prevalence, morbidity and mortality of diseases in a community. Population based studies are not available in most parts of the world because of lack of the expertise, reliable data bases, disease registries and resource constraints [4]. Hospital based studies give an insight into disease burden in a community and help clinicians, public health professionals and policy makers to make informed decisions regarding individual patient and population care in addition to planning health care delivery system [5]. In the past, communicable diseases accounted for most of the medical admissions across sub Saharan Africa [6]. But, there is a current global trend towards NCDs as documented in some literatures [7, 8]. Adult mortality in sub Saharan Africa is 4 – 40 times more than in developed countries [9–11] and the pattern of diseases responsible for this high adult mortality is not well characterized [12–14].

There seems to be wide variations in the patterns and outcomes of medical admissions observed in hospital-based studies across many cities in Nigeria [15–22], Uganda [23], India [24] and Saudi Arabia [25]. It has been projected by the WHO that by 2020, NCDs would surpass infectious diseases as the main cause of medical admissions and adult deaths [26]. However, Etyang and Gerard Scott in their systematic review concluded that cardiovascular and infectious diseases were currently the leading causes of admissions and in-patient deaths in sub Saharan Africa [27].

There is a dearth of published literatures on the diseases burden and treatment outcome in the only tertiary health facility in the commercial city of Aba in Abia state, Nigeria where lots of mercantile activities take place. We, therefore, set out to study the disease patterns and outcome of treatment in the medical wards of ABSUTH, Aba.

## 2 METHODOLOGY

A retrospective descriptive analysis was carried out on medical records of patients admitted into the male and female medical wards of ABSUTH, Aba. Aba is a commercial city in the Southeastern region of Nigeria known for her industrial, mercantile and craftwork activities. The hospital is the only tertiary health facility in Aba and gets referrals from all the primary and secondary health facilities in Aba and the neighboring states. The study covered a period of ten years between May 1, 2007 and April 30, 2017. Using the Nurse's Inpatient Admissions/Discharge Registers in the male and female medical wards, nurses report books and in some cases, case notes of some patients from the Medical Records Department of the hospital, all the patients admitted in the medical wards 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. Co morbid conditions were not included as diagnosis. 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.

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 discharged home, died, discharged against medical advice (DAMA) or transferred to another specialty outside the medical wards or to another health facility. The diseases diagnosed were grouped into body systems according to the WHO International Statistical Classification of Diseases version 10 (ICD-10) guidelines [28].

Ethical approval was obtained from the Institution's Ethics and Research Committee before commencing the study. Data obtained were analyzed using the Statistical Package for Social Sciences (SPSS Inc. Chicago IL) version 20.0 software. Qualitative data were expressed as frequencies and percentages while quantitative data were summarized as means and standard deviations. P values of <0.05 was regarded as statistically significant.

## 3 RESULTS

A total of 6587 admissions were recorded in the medical wards within the study period. There were 3153 males (47.9%) and 3434 females (52.1%) with a ratio of 1: 1.08. The age range was 15 – 103 years with a mean age of  $52.34 \pm 18.17$ ; male  $53.10 \pm 18.29$ , female  $51.64 \pm 18.04$ . The differences in the mean ages of the male and female patients admitted in the medical wards of ABSUTH was statistically significant ( $p < 0.05$ ). The minimum age of both male and female participants in the study was 15 years but the maximum ages of the males and females were 99 and 103 years respectively. The middle aged (33.4%) and the elderly patients (39.6%) formed a majority of the medical admissions while the teenagers (2.9%) were the least admitted in the medical wards (table 5). The mean duration of hospital stay was  $9.97 \pm 9.77$  days with a range of hospital stay of 1 – 123 days; male  $9.86 \pm 9.33$ , female  $10.07 \pm 10.15$ . The demographic characteristics of the participants were as shown in Tables 1 and 2.

### Pattern of diseases causing medical admissions in ABSUTH, Aba.

The commonest diseases responsible for admissions in the medical wards within the study period were diabetes mellitus related complications (18.5%) followed by HIV/AIDS (12.9%), stroke (12.6%), heart failures (12.1%), chronic kidney diseases (CKD) (5.6%), systemic arterial hypertension (4.8%), chronic liver diseases (4.7%) and acute malaria (4.1%). Communicable diseases (infectious and parasitic diseases) constituted 26.7% of the medical admissions while non-communicable diseases accounted for 73.3%. When pre-

**Table 1. Demographic characteristics of medical admissions in ABSUTH**

Indices	Frequency (n=6587) (%)
Age categories (years)	193 (2.9)
<20	1584 (24.0)
20-39	2197 (33.4)
40-59	2613 (39.7)
60 and above	6587 (100)
Total	
Gender:	3153 (47.9)
Male	3434 (52.1)
Female	

**Table 2. Age distribution of the subjects**

Mean age ( $\pm$ SD)	52.34 $\pm$ 18.17
Mean age male ( $\pm$ SD)	53.10 $\pm$ 18.30
Mean age female ( $\pm$ SD)	51.64 $\pm$ 18.04 (t=3.268, p=0.001)

sented according to systems of the body, infectious and parasitic diseases came up top, followed by the cardiovascular system, endocrine diseases (diabetes mellitus mainly), and the nervous system. Details are shown in Tables 3 and 4 .

**Table 3. Spectrum of the major diseases causing hospitalization in the medical wards of ABSUTH, Aba, within the study period is shown below:**

Diseases	Male	Female	Total (n=6587) (%)
HIV/AIDS	365	487	852 (12.9)
Malaria	138	135	273 (4.1)
Sepsis	88	72	160 (2.4)
PTB / extrapulmonary TB	89	61	150 (2.3)
Stroke	382	449	831 (12.6)
Diabetes mellitus related complications	599	621	1220 (18.5)
Heart failure	373	421	794 (12.1)
Hypertension	103	213	316 (4.8)
Chronic liver diseases	175	135	310 (4.7)
Acute viral hepatitis	39	27	66 (1.0)
PUD	24	43	67 (1.0)
CAP/suppurative lung disease	57	76	133 (2.0)
COPD/chronic bronchitis/emphysema	33	36	69 (1.0)
CKD/nephrolithiasis	209	163	372 (5.6)
Lymphoma/breast CA/other malignancies	33	30	63 (1.0)
Miscellaneous diseases	446	465	911 (13.8)
Communicable diseases (Infectious and parasitic diseases)	1757		(26.7)
NCD	4830		(73.3%)

Key: HIV/AIDS = human immunodeficiency virus/ acquired immunodeficiency syndrome, PTB = pulmonary tuberculosis, TB = tuberculosis, CLD = chronic liver disease, PUD = peptic ulcer disease, CAP = community acquired pneumonia, COPD = chronic obstructive pulmonary disease, CKD = chronic kidney disease, NCD = non-communicable disease.

NB: Miscellaneous diseases - any disease that contributed < 63 (1%) of medical admissions was included in the miscellaneous diseases.

**Table 4. Spectrum of diseases causing medical admissions in ABSUTH based on the ICD-10**

Code	Diseases	Frequency (n=6587) (%)
A	Infectious and parasitic diseases	1757 (26.7%)
B		
C	Malignant neoplasms	130 (2.0%)
D	Anemia	72 (1.1%)
E	Endocrine, nutritional and metabolism	1229 (18.7%)
F	Mental and behavioural disease	33 (0.5%)
G	Diseases of the nervous system	971 (14.7%)
H	Diseases of the circulatory system	1265 (19.2%)
I	Diseases of the respiratory system	268 (4.1%)
J	Diseases of the digestive system	464 (7.1%)
K	Diseases of the musculoskeletal system and connective tissues	23 (0.4%)
L	Diseases of the genitourinary system	255 (3.9%)
M		
N		
O		
P		
Q		
R	Others	120 (1.8%)

#### Outcome of hospitalization in the medical wards

A total of 4569 admissions (69.4%) into the medical wards improved and were discharged home, 1491 (22.6%) died, 289 (4.4%) were discharged home against medical advice and 238 (3.6%) were transferred to other centres or specialties Table 5 . With a medical ward mortality of 22.6%, the major causes of death within the study period were stroke (5.34%), HIV/AIDS (4.24%), DM related complications (3.78%), heart failures (1.61%) and CKD (1.69%) as shown in Table 6 . The differences in the outcome of the male and female patients were not statistically significant ( $X^2 = 5.811$ ,  $p > 0.05$ ). The outcome for the different age groups admitted in the medical wards of ABSUTH as shown in Table 5 is statistically significant ( $X^2 = 111.91$ ,  $p < 0.05$ )

**Table 5. Outcome of medical admissions stratified by age groups in ABSUTH**

Age (years):	Dis-charged home alive	Died	DAMA	Referred to other centres/specialties	Total
<20	152	19	10	12	193
20-39	1055	341	83	105	1584
40-59	1503	506	101	87	2197
60 and above	1859	625	95	34	2613
Total	4569	1491	289	238	6587

## 4 DISCUSSION

The finding in this report that diabetes mellitus related complications, HIV/AIDS, stroke, heart failures, CKD, systemic hypertension, chronic liver diseases and acute malaria were the major diseases responsible for medical admissions in ABSUTH within the study period is comparable to what was found in many Nigerian studies [15, 16, 19] and in Assir region of Saudi Arabia [25] . That NCDs contributed

**Table 6. Outcome of treatment of the major diseases that caused medical admissions**

	HIV/AIDS	DM	stroke	HF	CKD	HTN	malaria
Home	390	915	437	646	220	302	256
Dead	279(4.24%)	249(3.78%)	352(5.34%)	106	111(1.69%)	6	7
DAMA	55	46	36	20	17	8	10
Referred	128	10	6	5	24	0	0
Total	852	1220	831	777	372	316	273

Key: HIV/AIDS = human immunodeficiencyvirus/acquired immune deficiency syndrome, DM = diabetes mellitus, HF = heart failures, CKD = chronic kidneydiseases, HTN =systemic arterial hypertension, DAMA = discharged against medical advice.

73% of the medical admissions in this study is similar to findings in Ido Ekiti [15] . Abakiliki [16] and Enugu [19] ; and, this is in keeping with the current trend of increasing burden of non-communicable diseases in Africa. The explanation for this finding could be as a result of the westernized diets, sedentary lifestyles, resultant obesity and rapid urbanization taking place in sub-Saharan African countries including Nigeria. Our findings differ from those reported in Asaba [20] and the rural community of Okada [17] where infectious and parasitic diseases were predominant causes of hospitalization in the medical wards.

In the index study, the elderly participants (60 years and above) were in majority among the age groups admitted in the medical wards just as was found in the Ido Ekiti [15] study. The reason for this is, probably, because the elderly are prone to decreased body immunity with increased disease susceptibility and degenerative diseases. In addition, advancing age is an established risk factor for NCDs which, in this study, were topmost in the profile of diseases that caused hospitalizations. It could, also, be because the developing world is experiencing an ageing population with increasing burden of chronic diseases [29] . Again, this may be in keeping with the WHO projection that the total geriatric population [29] will double from 605 million in 2002 to 1.2 billion in 2025 while their population in sub Saharan Africa will double between 2000 and 2030. This finding is a contrast to the situation in Okada [17] community of Igbinediom University Teaching hospital, Abakiliki [16] and [20] Asaba where infectious and parasitic diseases (communicable diseases) were the major causes of hospitalization. The middle aged (40 – 59 years) came second as the age group most commonly admitted in the medical wards in this report just as was found in the Ido Ekiti [15] study. The implication of this is the loss of man-hours and the negative economic consequences.

More females than males were hospitalized over the study period. Similar finding was reported in Uganda [23] but contradicts those of some other researchers from within and outside Nigeria [15–19, 22, 30] . This could be because the present study spanned over 10 years with more participants than the other studies which were for a period of 2-3 years with fewer study

population. It could, also, be due to a better health seeking behavior among females [31] as reported by Omemu et al despite that it has been documented that males are at more risks than females for DM, strokes, CKD and other NCDs [32] . The teenagers (under-20 age group) had the least number of medical admissions in this study probably because NCDs which were predominant causes of hospitalization are uncommon in this age group.

The mortality rate of 22.6% in this report is higher than what was reported in some previous Nigerian studies [15–19] and Assir region of Saudi Arabia [25] but lower than the rate reported in Kano [21] . Reason for these differences in mortality in the published studies is not clear. In the index study, the contribution of stroke, heart failures, DM related complications and CKD to the medical wards mortality within the study period is comparable to the findings in related studies in Nigeria [15, 16, 20, 22] ). Stroke was the predominant cause of death probably because of the high prevalence of cerebrovascular risk factors (systemic arterial hypertension and DM) and increasing age of the study population. Similar to some other studies [15, 20] , this study showed that HIV/AIDS was a leading cause of death among the communicable diseases. This is not surprising since, unlike other CDs, HIV/AIDS is associated with many life-threatening opportunistic infections such as tuberculosis and viral infections. Infectious and parasitic diseases were not the leading cause of medical admissions or the commonest cause of death in this study unlike the situation in the Okada [17] study. A possible explanation for this could be increased personal hygiene and environmental sanitation due to the monthly cleaning exercise embarked upon by the states in the South East region of Nigeria for over a decade now.

Admission outcome data in this study are comparable to findings in the Kano study [21] . The implication of these findings is the need to improve public health programs aimed at preventing and controlling NCDs such as increase in health awareness and education programs. With this in place, cultural and superstitious beliefs that resulted to late presentations to hospitals and increased rate of DAMA will be minimized. It is important to note that systemic arterial hypertension and acute malaria were common causes of medical admission in this study but death as a result of either of them was scanty. Again, no case of snake bite was managed in the medical wards within the study period despite referral of patients from neighboring agrarian communities. Reasons for this are not clear but it could be that the superstitious tendency of the populace informed their decision not to bring snake bites patients to be treated in ABSUTH or that such patients with snake bites were treated and discharged home from or died at the Emergency unit of ABSUTH.

In this study, the mean duration of hospital stay was comparable to other Nigerian studies [15–22] It is important to note that the longest duration of hospital stay was recorded among patients managed for diabetic foot/hand ulcers and gangrene and patients that had stroke while short duration of hospitalization (24 hours) was common in those that died.

The latter could be because of late presentation to the hospitals as a result of illiteracy, poverty and superstitions.

Finally, findings from the index study could serve as a clinical audit of the medical wards of ABSUTH, Aba. Our findings could serve as a useful guide to the hospital management and other relevant stakeholders in the health sector in allocation of healthcare resources and other strategies to improve healthcare in the state. It will, also, serve as an important monitoring and evaluation tool for the Department of Internal Medicine, ABSUTH, Aba.

## 5 CONCLUSION/RECOMMENDATION

This study has shown that the elderly aged persons and females were predominantly admitted in the medical wards of ABSUTH, Aba within the period under review. Again, diseases responsible for most admissions in the medical wards were diabetes mellitus related complications, HIV/AIDS, stroke, heart failures, chronic kidney diseases, systemic arterial hypertension, chronic liver diseases and acute malaria. While NCDs constituted a majority of the medical admissions in ABSUTH, Aba, stroke, HIV/AIDS and DM related complications were the major causes of death in the medical wards. It is, hereby, recommended that effective health education programmes be put in place to check the increasing prevalence and impact of these diseases.

CONFLICTS OF INTEREST – Nil

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