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IN NORTH-EAST NIGERIA: A 5-YEAR REVIEW**

## PATTERN OF MEDICAL ADMISSIONS IN A TERTIARY FACILITY IN NORTH-EAST NIGERIA: A 5-YEAR REVIEW

Ayoola YA<sup>1</sup>, Okolie HI<sup>2</sup>, Ali MW<sup>3</sup>, Bathnna SJ<sup>2</sup>, Adamu A<sup>2</sup>, Zawaya KP<sup>2</sup>,  
Oyekunle RA<sup>2</sup>, Saad FK<sup>2</sup>, Ezeugonwa RS<sup>2</sup>, Fadare JO<sup>2,3,4</sup>

1. Department of Internal Medicine, Gombe State University, Gombe, Nigeria
2. Department of Medicine, Federal Teaching Hospital, Gombe, Nigeria
3. Department of Clinical Pharmacology, Gombe State University, Gombe, Nigeria
4. Department of Medicine, Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria

Correspondences to: Ayoola YA, Department of Internal Medicine, Gombe State University, Gombe, Nigeria. Email: [dryekeen@gsu.edu.ng](mailto:dryekeen@gsu.edu.ng)

### ABSTRACT

**Introduction:** The knowledge of morbidity pattern and its outcome is important for monitoring and evaluation of clinical practice. It is also essential for healthcare authorities to improve on services provided to the populace and for planning purposes. This study determined the morbidity pattern and outcome of patients admitted to the medical wards of a tertiary facility in North-East, Nigeria.

**Methods:** This was a retrospective study of admissions to the medical wards of the Federal Teaching Hospital, Gombe, Nigeria, between 2012 and 2016. The medical records of patients were retrieved and reviewed. Information obtained included demography, diagnosis, comorbid conditions and outcome of admission. The diagnoses were classified using the World Health Organisation (WHO) International Classification of Diseases (ICD) Version 11. Simple descriptive analysis was done.

**Results:** A total of 5176 patients were admitted in the medical wards of the hospital comprising of more female and married patients (53.3% and 84.5% respectively). The mean age was  $46.8 \pm 17.9$  with 45-54 years age bracket forming the largest proportion of patients. The most common cause for admission to the was infections (28.2%), followed by cardiovascular and renal diseases

(23.8% and 12.7% respectively). Overall mortality was 20.7%.

**Conclusion:** Non-communicable diseases were the major causes of medical admissions in this study though the proportion of infectious conditions was high. There is need to promote the preventive aspect of medicine to reduce the scourge of non-communicable diseases among the populace.

**Keywords:** Morbidity pattern; medical wards; in patients; Nigeria

### INTRODUCTION

Communicable and non-communicable diseases are responsible for a large portion of morbidity and mortality worldwide though there may be differences in prevalence across geographical regions.<sup>1-3</sup> In many low- and middle-income countries (LMICs), infections were more prevalent previously but this is changing with the “epidemiological transition” due to a significant increase in the prevalence of non-communicable diseases (NCDs) such as hypertension, diabetes mellitus and cancers.<sup>4,5</sup> A recent study using data from the Global Burden of Diseases showed that the burden of NCDs in sub-Saharan Africa in terms of disability-adjusted life-years (DALYs) had increased considerably.<sup>6</sup>

A systematic review of 86,307 adult medical admissions in Africa reported that

cardiovascular diseases had increased from 3.9% of all admissions in 1950-59 to 19.9% in 2000-2010.<sup>7</sup> One of the main reasons for this increase is lifestyle changes especially regarding diet and physical activity.<sup>8,9</sup> In addition, access to antibiotics and improved care of patients with infections such as pulmonary tuberculosis, HIV and malaria may have impacted positively on the spread of these disease conditions.<sup>10</sup> A demographic shift, especially, with people living longer in many LMICs has also been seen as being contributory to this transition.<sup>11</sup> In recent times however, studies have shown that this transition may not be unidirectional and that it is indeed a complex scenario.<sup>12</sup>

The knowledge of morbidity pattern and its outcome is important for monitoring and evaluation of clinical practice. It is also essential for healthcare authorities to improve on services provided to the populace and for planning purposes. There is a rich body of literature about pattern of admission to the medical wards of healthcare facilities across Nigeria.<sup>13-18</sup> However, there is paucity of information about medical admissions and their outcome at the Federal Teaching Hospital, Gombe (FTHG), North-east Nigeria. A review and documentation of the morbidity pattern in this facility will provide baseline data for evaluation of healthcare practice /outcomes and identify potential areas for intervention.

The main objective of this study was to determine the morbidity pattern and outcome of patients admitted to the medical wards of the FTHG over a period of 5 years.

## METHODS

This was a retrospective study of all medical ward admissions between January 2012 and December 2016.

### *Study setting*

The study was conducted at the Federal Teaching Hospital, Gombe. Gombe town is the administrative capital of Gombe State, located at the heart of the North-Eastern region of Nigeria. This tertiary healthcare facility provides services to the population of

the state and adjoining states of Adamawa, Yobe, Taraba, Bauchi and Borno. It is a 550-bedded facility that provides care in all medical specialties (Medicine, Surgery, Paediatrics, Obstetrics and Gynaecology, Psychiatry, etc). The facility has two medical wards (male and female) with a combined bed capacity of 80.

### *Study Procedure*

The medical records of patients admitted into the medical wards over the 5-year period were retrieved and reviewed. Information obtained included demography, diagnosis, comorbid conditions and outcome of admission. The diagnoses were classified using the International Classification of Diseases (ICD) Version 11. The retrieved information was coded and entered using SPSS version 25 software. Data analysis was done using descriptive statistics with results displayed in frequencies and percentages.

### *Ethical Considerations*

Patients' information retrieved for the purpose of the study was de-identified. Ethical approval for the study was obtained from the Research and Ethics Committee of the FTHG before commencement of the study (NHREC/25/10/2013).

## RESULTS

A total of 5176 patients were admitted in the medical wards of the hospital during the five-year duration comprising of more female and married patients (53.3% and 84.5% respectively). The mean age was  $46.8 \pm 17.9$  years with most patients within the 35-44 year and 45-54-year age brackets. Details of the socio-demographics are shown in Table 1.

Major causes of admission to the medical wards included infections (28.2%), followed by cardiovascular and renal diseases (23.8% and 12.7% respectively). Details of diagnoses according to ICD-11 classification are as shown in Figure 1.

Under the cardiovascular admissions, hypertensive heart disease (1002; 81.3%) was the most common while sepsis was the



**Table 1: Socio-demographic characteristics of patients\***

Variable	Frequency	Percentage
Sex		
Male	2197	46.7
Female	2508	53.3
Age group		
15-24	584	11.3
25-34	868	16.8
35-44	909	17.6
45-54	913	17.7
55-64	853	16.5
65-74	670	13.0
75 and above	361	7.0
Marital Status		
Single	472	10.1
Married	3968	84.5
Divorced	15	0.3
Widow/er	240	5.1
Educational Status		
Non-formal	1884	45.8
Primary	225	5.4
Secondary	1446	35.1
Tertiary	563	13.7
Tribe		
Fulani	1496	37.0
Hausa	642	15.9
Tangale	349	8.6
Tera	187	4.6
Kanuri	154	3.8
Bolewa	140	3.5
Bura	148	3.6
Waja	119	2.9
Babur	81	2.0
Karekare	73	1.8
Tula	60	1.5
Igbo	46	1.1
Cham	45	1.1
Wurkum	38	0.9
Yoruba	37	0.9
Pero	30	0.7
Ngizim	22	0.5
Dadiya	22	0.5
Jukum	20	0.5
Kilba	19	0.4
Bachama	16	0.4
Others**	300	7.4
Total	4044	

\*\*Others included: Kelba, Urhobo, Isoko, Chibok, Kambari, Efik, Ibibio, Igala, Benin, Isan, Tarop, Idoma, Berom, Nupe, Wandum, Ebira, Shuwa.

\*Missing data: 1132

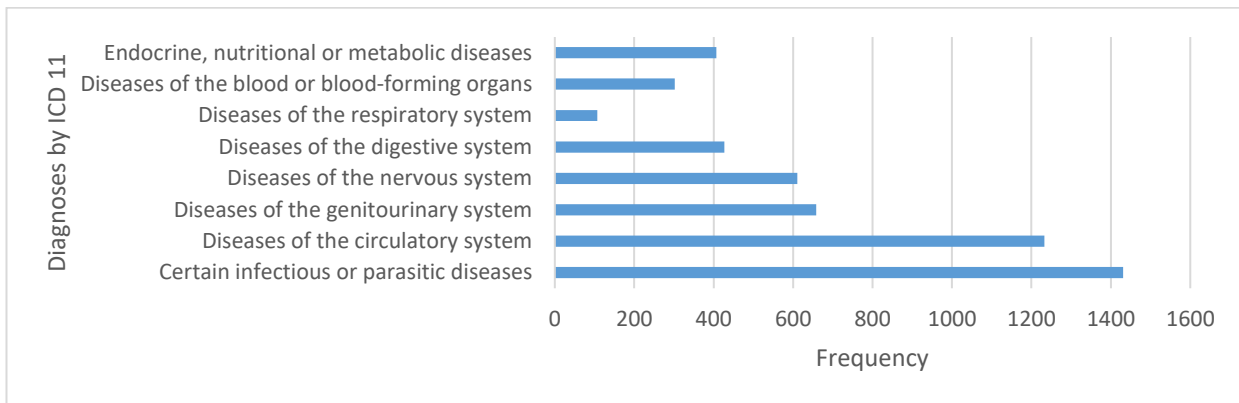
number one diagnosis under infections. In addition, stroke, diabetes mellitus and liver cirrhosis were the most frequent diagnosed conditions in the central nervous, endocrine and gastrointestinal systems respectively. The details of the diagnosed conditions by organ systems are as shown in Table 2.

The median duration of admission was 8 days (Range: 1-155). Majority (77.2%) of the admitted patients were discharged while overall mortality was 20.7%. Male to female mortality ratio was 1.3:1 (469/376). Mortality according to organ systems was highest with diseases of the nervous system (30.9%), followed by those of the digestive system (29.0%). Details of mortality according to organ systems are as shown in Figure 2. A negligible fraction (1.2%) left against medical advice.

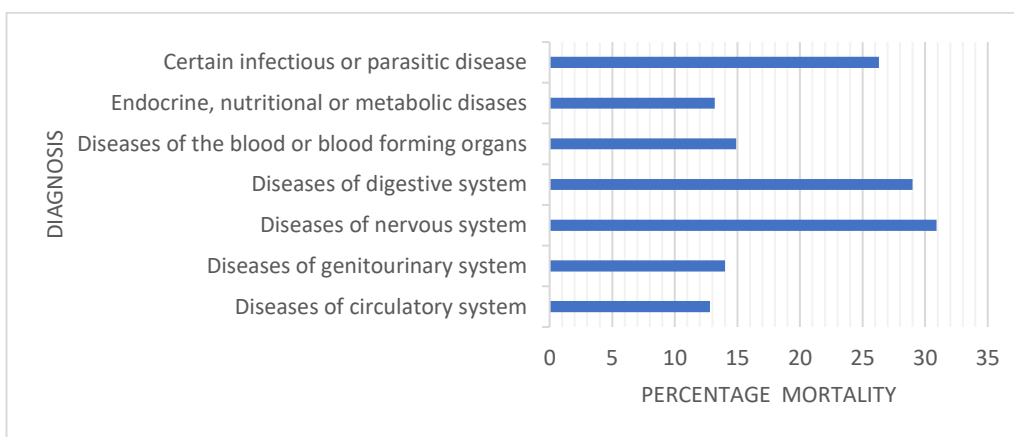
The number of annual number of admissions was highest in 2012 and lowest in 2014; the trend of annual number of admissions is as shown in Figure 3.

## DISCUSSION

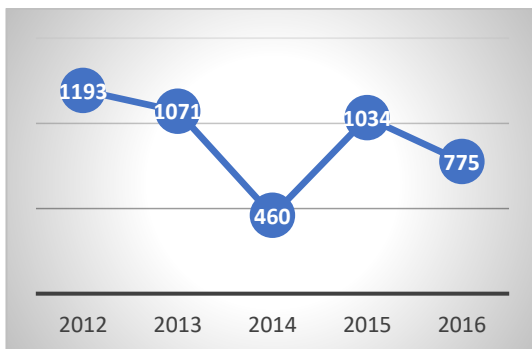
Non-communicable diseases (72.4%) were the more common cause of admissions to the medical wards in this 5-year review. Our finding is in keeping with reports from studies conducted in other parts of Nigeria, Sudan and Ethiopia.<sup>13,15,19,20</sup> The largest proportion of admissions during the study duration was the 45-54 years (17.7%) closely followed by 35-44 years (17.6%). Similar studies from Ethiopia showed younger age groups being responsible for majority of admissions to the medical wards.<sup>19,21</sup> In contrast, a Sudanese study reported 56-65 years as the most admitted age group.<sup>20</sup> A difference in the demographics of these countries may be responsible for these differences. In addition, variation in socio-cultural practices and lifestyle (including diet) may contribute to the observed differences. In our study, elderly patients constituted 20% of all admissions during the study period; this is slightly higher than 11.1% reported in another study conducted in Ilorin, Nigeria. On the contrary, 41% of all admissions in a tertiary facility in Port-Harcourt, Nigeria were the elderly, though the classification age used was 60 years.<sup>22</sup> Similarly, the elderly made up the majority of admissions to the medical wards in a tertiary rural facility in South-West Nigeria.<sup>13</sup>



**Figure 1: Diagnoses according to ICD-11 classification**



**Figure 2: Mortality according to ICD-11 disease classification**



**Figure 3: Trend of annual admissions**

A look at the individual systemic causes of admission showed that those of certain infectious or parasitic diseases were the most common. This is in agreement with findings from a systematic review of medical admissions across Africa with infectious diseases responsible for 19.8% rate.<sup>7</sup> This is slightly at variance with studies from other parts of Nigeria with systemic hypertension being the commonest reason for patients being admitted to the medical wards.<sup>23</sup>

Non-communicable diseases formed the largest proportion of all admissions to the medical wards with diseases of the circulatory system being the commonest cause in this study followed by those of genitourinary and endocrine system. This is in tandem with results of studies from other studies from Nigeria.<sup>13,23</sup> The pattern of disease may also depend on geographical location and existing fauna and animal species; a study conducted in Sudan identified snake bites and leishmaniasis as common causes of admission after cardiovascular diseases.<sup>24</sup> The number of annual admissions varied throughout the 5-year duration and this may be due to some disruptions in service provision (industrial actions) occurring during that period. This is a recurring problem in the context of Nigerian healthcare system.

The mortality rate in this study was 20%; it was higher than 11.1% and 12.9% reported in other studies from Nigeria but lower than

**Table 2: Details of diagnoses by systems**

Diagnosis	Frequency (N)	Percentages
<b>Certain infectious or parasitic diseases</b>		
*Sepsis	611	41.9
Pneumonia	275	18.9
HIV/AIDS	189	13.0
Infective gastroenteritis	79	5.4
Tuberculosis	211	14.5
Malaria	41	2.8
Acute meningitis	41	2.8
Others (Tetanus, Rabies, Lassa Fever)	11	0.7
<b>Diseases of the circulatory system</b>		
Hypertension/hypertensive heart disease	1002	81.3
Dilated cardiomyopathy	124	10.1
Acute coronary syndrome	48	3.9
Others (TB Pericarditis, Peripheral vascular disease)	59	4.7
<b>Diseases of the genitourinary system</b>		
Chronic kidney disease	299	45.4
Pyelonephritis	270	41.0
Obstructive uropathy	32	4.9
Glomerulonephritis	23	3.6
Acute kidney injury	22	3.3
Others (Adult polycystic kidney disease, Alport's syndrome, Interstitial nephritis, HIV-Associated Nephropathy, Ca Prostate)	12	1.8
<b>Diseases of the nervous system</b>		
Stroke	452	74
Syncope	75	12.3
Intracranial space-occupying lesion	30	4.9
Cord compression	19	3.1
Epilepsy	17	2.8
Others (Migraine, Guillain-Barre Syndrome, Cervical/Lumbar spondylosis, Parkinson's disease, Dementia and Cerebral abscess)	18	2.9
<b>Diseases of the digestive system</b>		
Liver cirrhosis	169	39.6
Peptic ulcer disease	136	31.9
PLCC	87	20.4
Abdominal tuberculosis	23	5.4
Others (Cholecystitis, Pancreatitis)	12	2.7
<b>Diseases of the respiratory system</b>		
Bronchial asthma	17	18.1
COPD	28	29.8
Respiratory failure	35	37.2
Others (Bronchogenic Ca, Occupational lung disease, Pulmonary thromboembolism)	14	14.9
<b>Diseases of the blood or blood-forming organs</b>		
Sickle cell disease	66	21.9
Leukemia	55	18.2
Vitamin B 12 deficiency	56	18.5
Lymphoma	44	14.6
Deep venous thrombosis	22	7.3
Others (Myelofibrosis, Multiple myeloma, Bleeding disorders)	68	12.3
<b>Endocrine, nutritional or metabolic diseases</b>		
Diabetes mellitus	355	87.2
Hypoglycaemia (drug-induced)	25	6.1
Thyrotoxicosis	4	1.0
Others (Acromegaly)	23	5.7

25.3% found in another local study.<sup>14,15,25</sup> Diseases of the nervous system recorded the highest mortality closely followed by those of the digestive system. Sub-analysis of this results showed that cerebrovascular accidents and chronic liver disease (cirrhosis and primary liver cell carcinoma) were the common causes in both organ systems respectively. In keeping with results of our study is the one conducted by Sadiq et al in

Tanzania where stroke was the most common cause of mortality.<sup>26</sup> These findings are at

variance from reports from a study conducted in Uganda where infections and tuberculosis were the major causes of mortality among medical in patients.<sup>27</sup> Also, studies conducted earlier in other parts of Nigeria reported infections as the commonest cause of in-patient mortality.<sup>14,25</sup> The difference in mortality from these studies may be due to differences in severity of disease presentation as well as access to, affordability and functional capacity of the healthcare facilities where these studies were conducted.

This was a single centre study hence its findings may not be generalizable to other settings. Also, this was a retrospective study, hence, the incidence of missing data that occurred in some instances. In addition, there were situations where a particular diagnosis could be classified within two organ systems (i.e. pneumonia as infections/respiratory); the findings should be interpreted with this understanding. However, this study, which has shown the pattern of medical admission and outcomes in FTHG, provides a baseline data for healthcare planning purposes and interventions needed to address the findings identified in this study.

## CONCLUSION

Non-communicable diseases, especially cerebrovascular accident and chronic liver disease were the major cause of medical admissions in this study though the proportion of infectious conditions was also significant. This is in keeping with national and regional trends. There is need to promote the preventative aspect of medicine to reduce the scourge of non-communicable diseases among the populace.

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