Pattern of the medical emergency department admissions in a tertiary hospital: A hospital-based prospective study

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Abstract

Introduction: Most emergency departments in Nigeria are usually merged (Surgical and Medical). The recently established Adult medical emergency unit of the University of Benin Teaching hospital (UBTH) is novel in Southern Nigeria. We sought to determine the pattern of purely medical emergency cases seen over a 6 months' period in our hospital.
Methods: It was a cross-sectional descriptive study involving all patients treated in the medical ED at University of Benin Teaching Hospital, Benin city over a six month period (August 2019-January 2020). An interviewer administered questionnaire was used to collect data on sociodemographic characteristics, presenting complaints, diagnosis, sub-specialty involved in management and outcome (discharge, admission, referral or death).
Results: A total of 875 patients were recruited for the study. There were 410(46.9%) males and 465(53.1%) females. The mean age was 57.8±19.94 years (range: 17 - 107 years).
The top 10 clinical diagnosis included stroke 146(16.7%), chronic kidney disease 59(6.7%), diabetic emergency 59(6.7%), pneumonia 57(6.5%), congestive cardiac failure 53(6.1%), type- 2 Diabetes mellitus with chronic complications50(5.7%), malaria49(5.6%), retroviral disease 33(3.8%), hypertensive emergency29(3.3%) and Tuberculosis28(3.2%).
Conclusion: Neurological and infectious diseases were the most frequent reason for consultation. Stroke was the singular most common diagnosis in the medical emergency. A prior consultation to a peripheral center was high amongst patients observed during the study period.

Modèle d'admissions aux services d'urgence médicale dans un hôpital tertiaire : une étude prospective en milieu hospitalier

Resume
Introduction: La plupart des services d'urgence au Nigeria sont généralement fusionnés (chirurgicaux et médicaux). L'unité d'urgence médicale pour adultes récemment créée à l'hôpital universitaire du Bénin (UBTH) est une nouveauté dans le sud du Nigeria. Nous avons cherché à déterminer la répartition des cas d'urgence purement médicale vus sur une période de 6 mois dans notre hôpital.
Méthodes: Il s'agissait d'une étude descriptive transversale portant sur tous les patients traités à l'urgence médicale de l'hôpital universitaire du Bénin, ville de Benin, sur une période de six mois (août 2019-janvier 2020). Un questionnaire administré par un intervieweur a été utilisé pour collecter des données sur les caractéristiques sociodémographiques, la présentation des plaintes, le diagnostic, la sous-spécialité impliquée dans la gestion et les résultats (sortie, admission, référence ou décès).
Résultats: Au total, 875 patients ont été recrutés pour l'étude. Il y avait 410 (46,9 %) hommes et 465 (53,1 %) femmes. L'âge moyen était de 57,8 ± 19,94 ans (extrêmes : 17 - 107 ans).
Les 10 principaux diagnostics cliniques comprenaient un accident vasculaire cérébral 146 (16,7 %), une maladie rénale chronique 59 (6,7 %), une urgence diabétique 59 (6,7 %), une pneumonie 57 (6,5 %), une insuffisance cardiaque congestive 53 (6,1 %), un diabète de type 2. sucré avec complications chroniques50(5,7%), paludisme49(5,6%), maladie rétrovirale 33(3,8%), urgence hypertensive29(3,3%) et tuberculose28(3,2%).
Conclusion: Les maladies neurologiques et infectieuses étaient le motif de consultation le plus fréquent. L'accident vasculaire cérébral était le diagnostic le plus courant en cas d'urgence médicale. Une consultation préalable dans un centre périphérique était élevée parmi les patients observés pendant la période d'étude.

INTRODUCTION

Life expectancy is currently about 54-years in Nigeria[1]. This is so different from many countries like France, UK, Spain with a life expectancy of above 80-years[2]. An explanation for this marked difference may be because of the marked deficit of health care workers and poor healthcare delivery systems. For example, the ratio of doctor to patient in Nigeria is estimated to be 1:2753 translating to 36.6 medical doctors per 100000 persons[3]. Communicable diseases are responsible of more than 50% of mortality in some African countries. Measles, rabies, cholera, leprosy and yellow fever outbreaks are periodically reported[4]. Africa is considered an area with high transmission rate of Plasmodium falciparum malaria, with more than 2 million confirmed cases in 2014, although its related mortality has recently decreased[5-6]. Incidence of tuberculosis (TB) keeps increasing, with no conclusive data on multidrug-resistance related. There has been a reported increase in other causes of mortality such as HIV, and cardiovascular causes (stroke or ischemic heart disease). [7-8]

Emergency care and treatment is accessible for all the population with minimal affordable consultation fees. No specific emergency medical training or pre-hospital medical care services exist in most African countries. However, positive experiences have been observed in our centre as trainings were offered to medical residents by the Royal college of Physicians in conjunction with the West African college of Physicians. Similar positive experiences have also been reported in Ghana and Tanzania.[9--10]A major pitfall is the great variability in infrastructure and human resources of EDs where many health centers are ran by personnel with basic medical training.[11] In consequence, there is scarce information in the literature focusing on pathologies and the clinical profiles of patients urgently attended in this geographical area. The present study aimed to describe the profile of pathologies and patients attended to in the ED of a tertiary urban hospital in a low-income African country. In addition, this study may give indirect information on the community health and resources that should be provided to health professionals.

MATERIALS AND METHODS

Study area

The Hospital, University of Benin Teaching Hospital is in Benin city, Edo state, Southern part of Nigeria with an estimated population of 5 million inhabitants[12]. It is an 800 bedded capacity hospital with an outpatient clinic, basic laboratory, and radiology and ultrasound service. The Emergency Department (ED) has 30 beds and is attended by 25 nurses with training in diagnosis and treatment on a 24-hour work shift with 4 on-call doctors per 12 hours working shifts.

Data collection and analysis

In this prospective cross study we analysed all the patients treated in the Medical emergency department of the university of Benin Teaching Hospital from august 2019 to January 2020. The information that was obtained included sociodemographic data like age, gender and ethnicity. The second section involved information on presenting compliant, duration of symptoms and prior visit to peripheral health facility. The third section involved information on the service assignment (neurology, infectious disease, cardiology, gastroenterology, endocrinology, nephrology, respiratory, clinical pharmacology, hematology, dermatology and rheumatology) and final diagnosis.

For further analysis, patients were grouped in age ranges: under 20 years, from 21 to 30 years, from 31 to 40 years, from 41 to 50, from 51 to 60, from 61 to 70 and over 70 years. The reason for consultation was then grouped according to body systems and medical specialties.

Statistical analysis

All data were analysed with IBM-SPSS version 21. Quantitative variables were expressed as mean ± standard deviation (SD) and qualitative variables as frequencies and percentages. Qualitative variables were compared using Chi-square test and quantitative variables using Student's T-test. For analytical statistics, 95% Confidence Intervals (CI) were calculated, and a value of $p < 0.05$ was considered statistically significant.

Ethical approval: Ethical approval for study was obtained from hospitals ethical committee (ADM/E22/AVOL.V11/148279).

RESULTS

During the period of the study 875 patients were attended in the ED. The mean age was 57.8± 19.9 years (range: 17-107years). Four hundred and sixty five (53.1 %) were females and 410(46.9%) were males. The distribution of patients according to the age range was: under 20years: 43 (4.9%), 21-30 years: 115 (13.1%),

31-40 years: 117 (13.4%), 41-50 years: 119 (13.6%), 51-60 years: 153 (17.5%). 61-70: 147 (16.8%) and older than 70 years: 181 (20.7%).

Eight hundred and eighteen (93.5%) respondents, had secondary level of education while 57(6.6%) had either primary or no form of educational training. Duration of symptoms was acute (less than 1 month) in majority of patients managed occurring in 656(75%) of patients studied.

Three hundred and fifty-two (40.2%)% had a preceding visit to a peripheral health facility before presenting at the university of Benin Teaching hospital while 523(59.8%) had no prior visit to a peripheral center concerning presenting complaints.

The distribution by service assignment was: Neurology 197(22.5%), infectious disease 143(16.3%), endocrinology 108(12.3%), gastroenterology 85(9.7%), cardiology 85(9.7%), nephrology 84(9.6%), respiratory 72(8.2%), clinical pharmacology 22(2.5%). Hematological 22(2.5%), dermatology 12(1.4%), rheumatology 4(0.5%).

The most frequent morbidities observed in a decreasing order of prevalence were; stroke 146(16.7%), chronic kidney disease 59(6.7%), diabetic emergency 59(6.7%), pneumonia 57(6.5%), congestive cardiac failure 53(6.1%), type 2 DM with chronic complications 50(5.7%), malaria 49(5.6%), retroviral disease 33(3.8%), hypertensive emergency 29(3.3%) and Tuberculosis 28(3.2%).

The 10 most common presenting complaint observed in this study were; Fever 226 (25.8%); weakness 195(22.3%) and abdominal pain 159(18.2%); pedal swelling 139(15.9%); loss of consciousness 132(15.1%); cough 117(13.4%); dyspnea 116(13.3%); irrational behavior 107(12.2%); vomiting 105(12%); and diarrhea 71(8.1%) in a decreasing order of frequency. There was no significant difference between any of the various presenting complaints and the gender ($p>0.05$)

DISCUSSION

We observed 875 respondents during our study period. The females accounted for 53.1% while males accounted for 46.9%. The morbidities with the highest prevalence observed were; stroke 146(16.7%), chronic kidney disease 59(6.7%), diabetic emergency 59(6.7%), pneumonia 57(6.5%), congestive cardiac failure 53(6.1%), type 2 DM with chronic complications 50(5.7%), malaria 49(5.6%), retroviral disease 33(3.8%), hypertensive emergency 29(3.3%) and Tuberculosis 28(3.2%).

The recently established Medical emergency unit is a 30 bedded facility which receives adult emergency cases from all parts of Edo state, Delta state and other parts of southern Nigeria. Edo state has an estimated population of 5 million inhabitants. It is made up of four major ethnic groups namely Bini, Esan, Etsako and Owan. There is however a high presence of residents across the country and the world in general because of its cosmopolitan tendencies. This fact stresses the need for specific resources and acute medicine training for the health professionals in the ED. While in Ethiopia, the elderly patients treated in the ED accounted for only 4.6%[12], in our study, this age group accounted for 181(20.7%). This high representation of the elderly in our study may be a reflection of the fact that reports have shown that the disease patterns and mortality rates from age-related morbidities like cerebrovascular accidents, cardiovascular diseases, type 2 Diabetes and chronic kidney disease is on the increase in Nigeria.[13]

Neurological emergencies were the most common cases received in the ER accounting for 22.5% of admissions. Stroke was the most common diagnosis made representing 16.7%. in our study. Similarly, Ansa and colleagues in their study on profile of medical admissions over 2 decades ago found strokes to be the 2nd most common reason for medical admissions at Uyo Teaching Hospital (34%), while heart failure(44%), was the most common morbidity admitted during their 6 years retrospective study.[13] Stroke is a major public health problems in the world today[14]. It is the third leading cause of death worldwide after ischaemic heart disease and cancer.[15] Its prevalence has increased significantly over the last decade especially in African countries.[16] Risk factors for this include hypertension, diabetes mellitus, dyslipidaemias, smoking, alcohol etc. Furthermore, it has been recently shown that stress may be a strong predisposing factor for stroke. Nigeria is presently facing a major economic crisis, with a minimum wage of only 30 dollars monthly.[17] The citizens are challenged with an increased economic and financial burden having to care for basic necessities of daily living. This may have impacted on our observation in this study There are various biological mechanisms by which psychosocial stress can increase stroke. One mechanism is that during active coping, there is associated increased cathecolamines and sympathetic activation which will directly or

indirectly affect the blood pressure.[18] Psychosocial stress has also been associated with accelerated atherosclerotic changes within the carotid arteries, and preliminary finding showed that a reduction in stress reduced atherosclerotic changes within the carotid arteries in hypertensive blacks.[19]

Infectious causes were the second most common predominant reason for consultation. They accounted for over 16.3% of the cases seen. The most common infectious diagnosis made were pneumonia, malaria and retroviral disease accounting for 6.5%, 5.6% and 3.8% respectively. Our data were congruent with other studies where respiratory infections, malaria and HIV were the very common reasons why people sought urgent medical aid in Africa.[7-8]

Chronic kidney disease also featured prominently in our study representing 6.7% of diagnoses made. Hypertension and diabetes mellitus (chronic non-communicable diseases [NCDs]) are the two predominant causes of CKD worldwide.[19] However, chronic glomerulonephritis and interstitial nephritis are the major causes of CKD in developing countries of the world. This is a reflection of the high prevalence of bacterial, parasitic, and viral infections (communicable diseases) that affect the kidneys in these countries.[20] The incidence of CKD is also increasing at a more rapid rate in developing countries. These differences between the developed and the developing countries are as a result of the burden of CKD moving away from communicable diseases and toward chronic. The attention being paid globally to CKD is attributable to five factors: the swift rise in its prevalence, the cost of treatment, recent data indicating that overt disease is the tip of an iceberg of covert disease, an appreciation of its major role in increasing the risk of cardiovascular disease, and the discovery of effective measures to prevent its progression.[20]

Acute and chronic diabetic complications constituted 6.7% and 5.7% of patients admitted during the study. Diabetes mellitus is becoming a growing problem in the developing countries. The estimated prevalence of diabetes in Africa is 1% in rural areas, and ranges from 5% to 7% in urban sub-Saharan Africa .[21] Nigeria, with a population of 158 million people, accounts for one sixth of Africa's population.[3] Approximately 50% of Nigerians are urban dwellers and the country has a cultural diversity and 398 documented ethnic groups.[22] Health care delivery as in most developing countries of the world is at best sub-optimal and this may be responsible for the dismal health indicator statistics such as reduced life expectancy at birth and increased maternal mortality.

Health care provision in Nigeria is a concurrent responsibility of the three tiers of government and its currently far from optimal. Health insurance is still taking tottering steps despite having being inaugurated about 20years ago and healthcare payment is largely personal. This is most times too much to bear for the average Nigerian who is usually out at the elbows as a result of the abysmal monthly minimum wage of thirty dollars.[17]

Limitation of study: It was performed in a single center. In times of great attendance, probably not all patients were registered by the nurse. Together with the few available complementary explorations to support clinical suspicion, this fact may have contributed to a deficiency in some subspecialty assignments.

CONCLUSION

The Medical emergency department in our region receives a variety of medical emergencies spanning across various subspecialties assignment. Stroke, infections (especially pneumonia, malaria and retroviral disease), CKD and diabetic emergencies were the diagnosis mostly represented in this study.

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. **Table 1: Socio-Demographic Characteristic of Respondents**

Variables	Frequency (N = 875)	Percent
Sex		
Male	410	46.9
Female	465	53.1
Age (years)		
=20	43	4.9
21-30	115	13.1
31-40	117	13.4
41-50	119	13.6
51-60	153	17.5
61-70	147	16.8
>70	181	20.7
Employment		
Employed	136	15.5
Unemployed	53	6.1
Self-employed	402	45.9
Not eligible	284	32.5
Marital Status		
Single	194	22.2
Married	511	58.4
Separated	7	0.8
Divorced	16	1.8
Widowed	147	16.8
Educational Status		
None	4	0.5
Primary	53	6.1
Secondary	425	48.6
Tertiary	393	44.9
Occupation		
Nil	43	4.9
Applicant	18	2.1
Armed Forces	12	1.4
Artisans	177	20.2
Business	105	12.0
Civil Servant	50	5.7
Clergy	12	1.4
Health care Practitioner	19	2.2
House Wife	14	1.6
Professional	48	5.5
Retired	131	15.0
Student	81	9.3
Trader	165	18.9

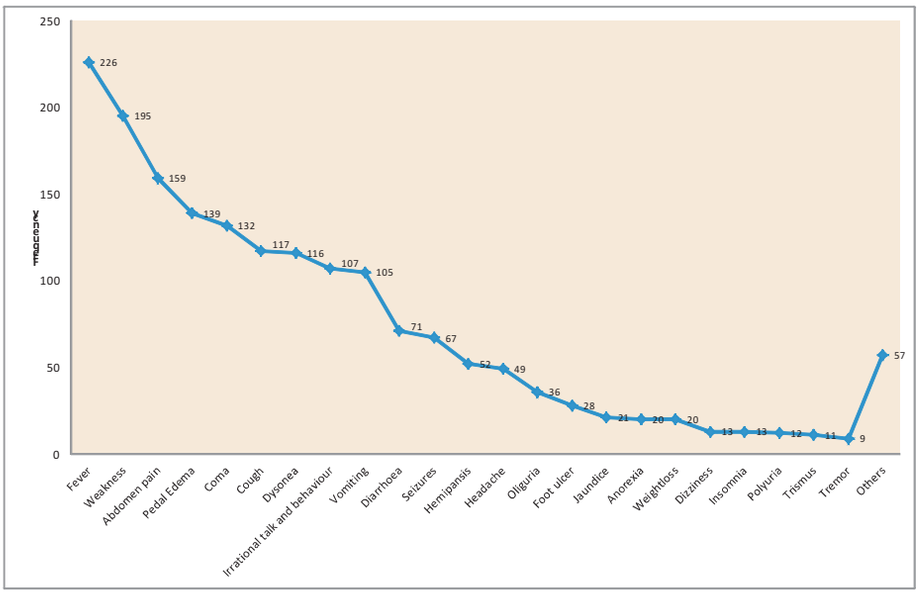

Figure 1: Presenting Compliant

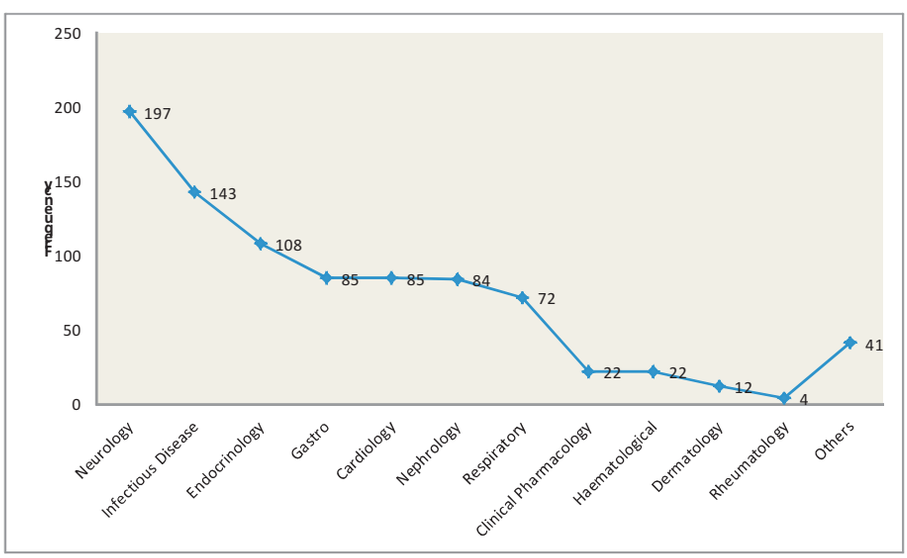

Figure 2: Specialties

Table 2: Clinical Characteristics of Respondents

Variables	Frequency (N = 875)	Percent
Prior visit to peripheral centre		
Yes	352	40.2
No	523	59.8
Duration of symptoms before admission (Months)		
<1	656	75.0
1-3	103	11.8
4-6	41	4.7
7-9	12	1.4
10-12	11	1.3
>1year	52	5.9

Table 3: Association between Most common complaints and Sex

	Sex		χ^2	P-value
	Male	**Female**		
Fever	100(24.4)	126(27.1)	0.833	0.361
Weakness	98(23.9)	97(20.9)	1.164	0.281
Abdomen pain and behavior	79(19.3)	80(17.2)	0.624	0.429
Pedal Edema	66(16.1)	73(15.7)	0.026	0.872
Coma	60(14.6)	72(15.5)	0.123	0.726
Vomiting	48(11.7)	57(12.3)	0.063	0.802
Irrational talk and behavior	57(13.9)	50(10.8)	2.014	0.156
Dysonea	52(12.7)	64(13.8)	0.221	0.638
Cough	57(13.9)	60(12.9)	0.188	0.665
Diarrhoea	29(7.1)	42(9.0)	1.122	0.290

Table 4: Final Clinical Diagnosis

Final Diagnosis	**Frequency**	**Percent**
Stroke	146	16.7
CKD (Chronic Kidney Disease	59	6.7
Diabetic Emergency	59	6.7
Pneumonia	57	6.5
CCF (Congestive Cardiac Failure	53	6.1
Type 2 DM with chronic complications	50	5.7
Malaria	49	5.6
RVD (Retroviral Diseases)	33	3.8
Hypertensive Emergency	29	3.3
Tuberculosis	28	3.2
Gastroenteritis	27	3.1
PUD	27	3.1
Seizure disorder	26	3.0
Upper GI Bleeding	20	2.3
Psychosis	14	1.6
HBSS	13	1.5
CLD (Chronic Liver Disease)	12	1.4
Pyelonepharitis	10	1.1
Depression	9	1.0
Meningitis	8	0.9
AKI (Acute Kidney Injury)	8	0.9
Acute poisoning	8	0.9
Cellulitis	8	0.9
ADR (Adverse Drug Reaction)	8	0.9
PLCC	7	0.8
Chronic Anaemia	7	0.8
Acute Hepatitis	7	0.8
Schizopherenia	6	0.7
Asthma	6	0.7
COAD	5	0.6
Snake bite	5	0.6
Acute abdomen	5	0.6
SLE	4	0.5
VHF (Viral Hemorrhagic fever)	3	0.3
Headaches	3	0.3
Tetanus	3	0.3
Cord compression	3	0.3
Nephrotic syndrome	3	0.3
Alcohol intoxication	3	0.3
Others	44	5.0
Total	875	100.0

Table 5: Gender distribution along treatment specialties

Specialties	Sex		Total
	Male	Female	
Neurology	97(23.7)	100(21.5)	197(22.5)
Respiratory	33(8.0)	39(8.4)	72(8.2)
Dermatology	7(1.7)	5(1.1)	12(1.4)
Gastro	43(10.5)	42(9.0)	85(9.7)
Cardiology	35(8.5)	50(10.8)	85(9.7)
Endocrinology	40(9.8)	68(14.6)	108(12.3)
Nephrology	47(11.5)	37(8.0)	84(9.6)
Clinical Pharmacology	15(3.7)	7(1.5)	22(2.5)
Infectious Disease	62(15.1)	81(17.4)	143(16.3)
Haematological	11(2.7)	11(2.4)	22(2.5)
Rheumatology	0(0.0)	4(0.9)	4(0.5)
Others	20(4.9)	21(4.5)	41(4.7)
Total	410(100.0)	465(100.0)	875(100.0)

$\chi^2 = 18.060$ $p = 0.080$

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