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Pattern of presentation and diagnoses at the Emergency Department of a Nigerian tertiary hospital over a period of twelve months

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Abstract

Background: Emergency Departments (EDs) receive a variety of patients with different exigent and challenging health conditions. This almost always puts the staff within the department under intense pressure which could adversely affect proper documentations and record keeping. To this end, we conducted a one-year (01 January to 31 December, 2019) review of ED patient case records.

Objective: The objectives of the study were to determine the pattern of presentation and missing diagnoses on patients' case records at the ED.

*Methods***:** A retrospective review of records of all patients who presented at the ED within the period of study was done. Data for the review included demography and diagnosis by attending emergency physicians. All cases in which a diagnosis was not recorded in the ED treatment card were categorized under missing a diagnosis and those with percentages less than 0.1 were grouped as other diagnoses.

*Results***:** A total of 9,880 patients were attended to in 2019. About half (4,868/9880, 49.3%) were males while (4,987/9880, 50.5%) were females with a small number without gender specified (25/9880, 0.2%). The median age of the patients was 38 years with inter-quartile range of 27 to 54 years. Medical emergencies were the leading types of emergencies (5737/9880, 58.1%) followed by surgical emergencies (3047/9880, 30.8%). The five leading diagnoses were cardiovascular diseases (1057/9880, 10.7%), Road Traffic Accidents (951/9880, 9.6%), Malaria (802/9880, 8.1%), Head Injury (408/9880, 4.1%) and Fractures (408/9880, 4.1%). A high percentage of missing a diagnosis (1260/9880, 12.8%) was recorded.

Conclusion: Our study revealed a high number of diverse cases at the ED from January to December, 2019. The largest proportion of patients was in the age group of 21 to 40 years (40.9%). Medical emergencies were the commonest (58.4%) presentation, with cardiovascular emergencies predominating. A proportion (1260/9880, 12.9%) of the documentation was missing a diagnosis. There is the need to improve on the accuracy of documentation and efficiency delivery in the Emergency Department. It is also a pointer to the need to rapidly scale up the current deployment of electronic medical records systems in the hospital.

Keywords:

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Introduction

The emergency department (ED) constitutes one of the vital entry points of patients to the health care delivery of any hospital. Emergency Departments handle all manner of surgical and medical emergencies including presentations without prior appointment. The outcome of treatment at Emergency Departments has been reported to be dependent on many factors, including delay in presentation [1]. Emergency care at any health institution should be of high quality, cost effective and compassionate [2].

The Emergency Department of University College Hospital caters for about 10,000 patients annually. It admits about 30-35 patients daily and patients are guaranteed qualitative care throughout their stay. The department receives patients with varieties of exigent and challenging health conditions. The diverse health conditions with different degrees of severity range from medical emergencies, surgical and obstetrics and gynaecology cases. The ED provides the triaging, evaluation, initial resuscitation and stabilization of the patients. ED also provides a working diagnosis, referral or definite treatment depending on the clinical condition of the patient. The pattern of cases seen at the ED of any hospital world-wide could be a good indicator of the prevalence of the health problem in the region where the hospital is located [3].

The outcome of cases presenting at the ED depends to a large extent on manpower and facilities available at the institution [4]. However, in many institutions, there is lack of data on the pattern of diseases presenting at the EDs especially in institutions located within resource constrained countries [5]. The study evaluated the pattern of diseases, and level of documentations of cases, presenting at the ED of the University College Hospital, Ibadan, between January and December 2019.

Methodology

*Study Setting***:**

his study was carried out at the adult emergency department of the University College Hospital Ibadan, a principal referral hospital in the South West Nigeria. This department has ten units namely: Medical Emergency, Emergency Trauma Clinic, Radiology Unit, Theatre, Burn Unit, Plastering Room, Endoscopy Unit, Laboratory, Pharmacy Department and Medical Stores located within the Emergency Department. The department caters for three categories of patients namely Medical emergencies, Surgical emergencies and Obstetrics and Gynecology (O&G). Obstetrics and Gynecology emergencies are attended to at the O&G clinics between 8am to 4pm during work days (Monday to Friday). Obstetrics and Gynecology emergencies present to the ED after office hours (4pm) during the weekdays and 24 hours on Saturdays, Sundays and on public holidays. The study was carried out on all patients who presented at the ED of the hospitals between January and December 2019.

Study inclusion criteria

Records of all patients attended to at the ED within the stipulated period were reviewed. Data extracted include age, gender, diagnosis at presentation, treatment outcome, and shift duty of the attending emergency team of health workers. Records without age stated were categorized under unspecified. All diagnoses written on the ED case files were captured as independent events.

Exclusion Criteria: All cases attended to outside the stipulated study period were not included.

*Missing a Diagnosis***:** This was applied to all cases in which a diagnosis was not recorded on the ED treatment card.

Missing an outcome: referred to records that did not have the outcome of the patients admitted to the ED indicated.

Other Diagnoses: Diagnoses having a proportion of less than 0.1 were placed in the "other diagnoses" category. Mortality rate was determined by dividing total number of deaths by total number of cases that presented at ED. Brought in dead (BID) were those found to be clinically dead upon arrival at the ED. Patients who decided to discontinue management and leave against medical advice were categorized under DAMA (Discharged Against Medical Advice). Shift refers to the period of duties at the ED, referring to morning shift (8am – 2pm), afternoon shift (2pm – 8pm), and night shift (8pm – 8am).

Data Processing and Analysis: The data was retrieved from the admission books of the ED and entered into SPSS version 20.0. The retrieved data was double-checked for accuracy independently by two of the investigators. Data cleaning was carried out by using exploratory data analysis. Data was analysed using descriptive statistics. Frequency table, bar chart and simple line graph were used in presenting the data.

Results

Nine thousand eight hundred and eighty (9,880) patients presented at the ED during the period of the study. It was observed that about half (4,868/9880, 49.3%) were males while (4,987/9880, 50.5%) were females with a proportion (25/9880, 0.2%) with their gender not specified. The male to female ratio was 1:1.02. The median age of the patients was 38 years with inter-quartile range of 27 to 54 years. Details of age distribution are as presented in table 1.

Table 1: Age distribution of patients seen at the ED between January and December 2019

Bio-Data	Frequency	Percentage
Age Group		
1- 20	1282	13.0
21 – 40	4039	40.9
41 – 60	2537	25.7
61 – 80	1360	13.8
>=81	261	2.6
Unspecified	401	4.1

Most admissions at the ED occurred during the afternoon and night shift at (3562/9880, 36.1%) and (3568/9880, 36.1%) respectively. In a few cases (7/9,880, 0.1%) the record did not indicate the shift of admission (figure 1). The analysis of the 9,880 that presented in 2019 showed a wide spectrum of clinical diagnoses (figure 2). Analysis of the retrieved records also showed that the months with the highest

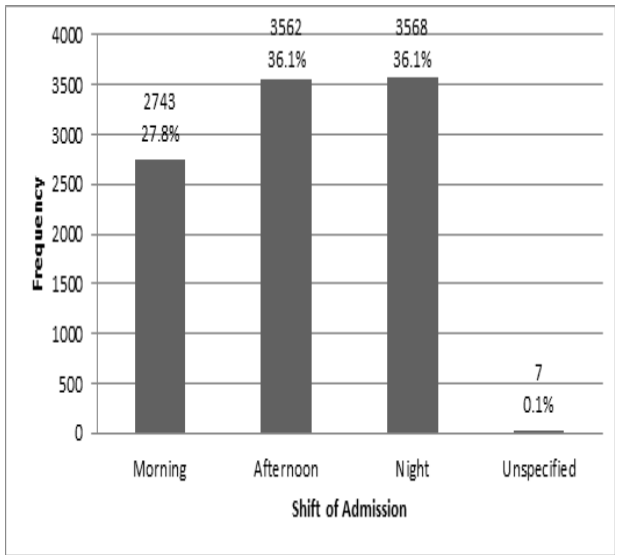

Fig. 1: Proportion of patients admitted during the different shifts at the ED

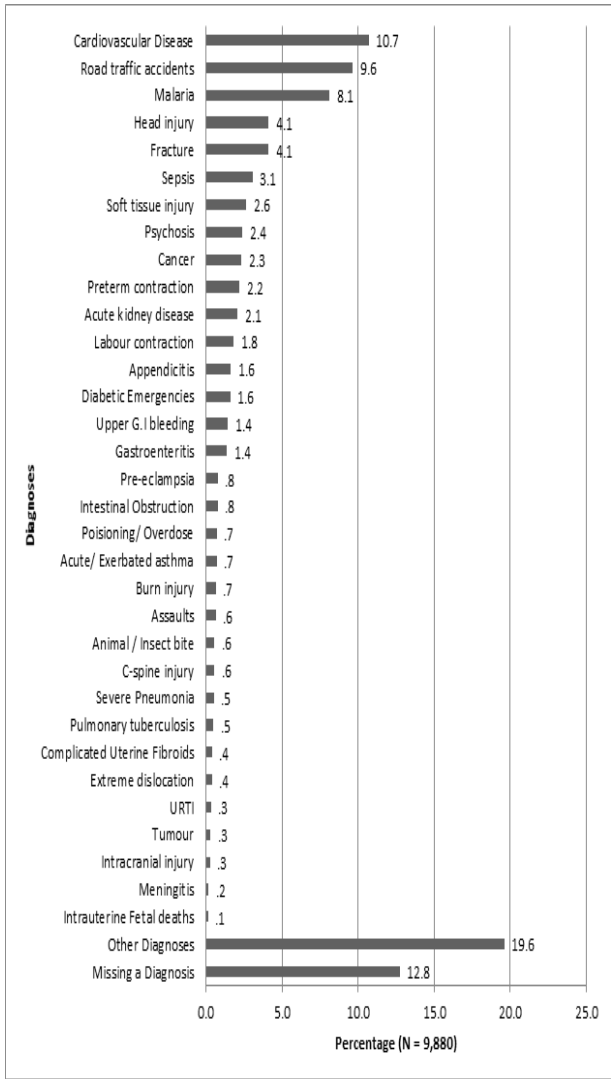

Fig. 2: Spectrum of Diagnoses at the ED, from January to December 2019

admissions were April, August and October (figure 3).

0.6% (57/9,880) were brought in dead (BID) to the ED (figure 4).

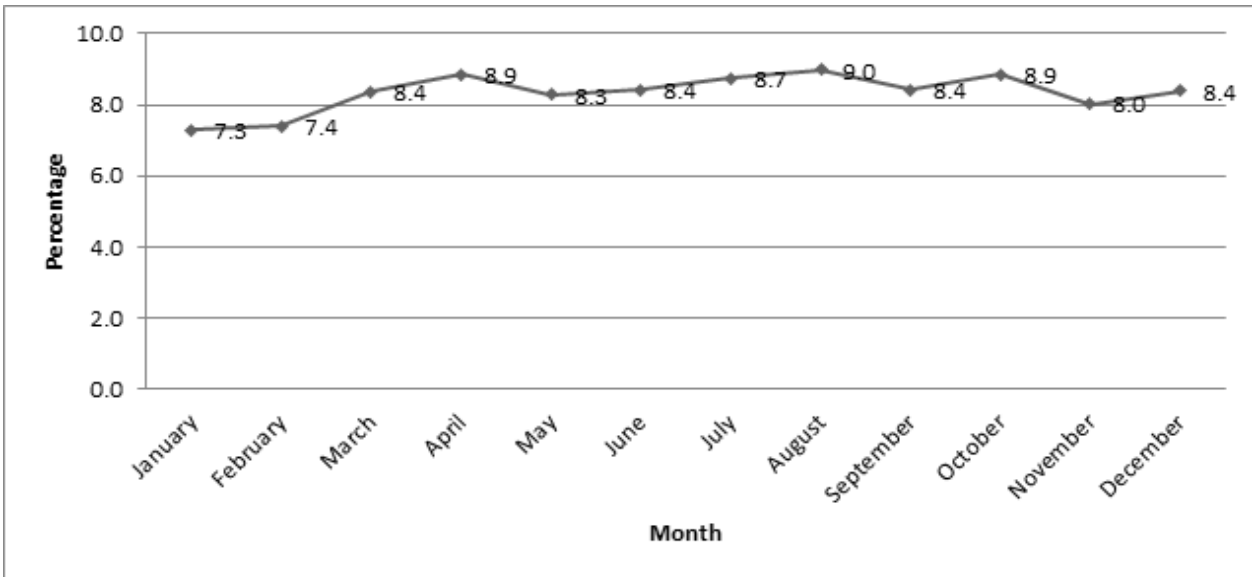

Fig. 3: Monthly rate of admission at the ED from January to December 2019

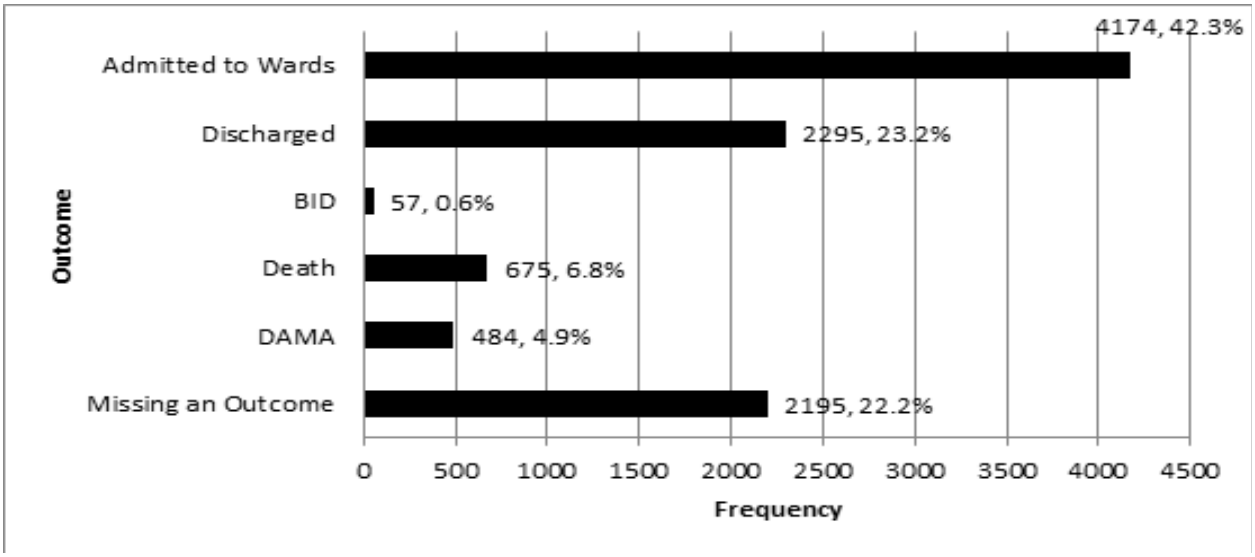

Fig.4: Outcomes of Admissions to the Emergency Department

Outcomes of Admissions to the Emergency Department

Out of the 9,880 records reviewed, four thousand one hundred and seventy-four (4,174/9,880, 42.3%) were admitted to the wards for further care. About twenty three percent (2,295/9,880, 23.2%) were treated at and discharged from the ED. Four hundred and eighty four (484/9,880, 4.9%) patients were discharged against medical advice from the ED. Mortality rate during the period studied was 6.8% (675/9,880). Analysis of the records also showed that

Majority of cases seen were medical emergencies (5767/9880, 58.37%), followed by surgical cases (3060/9880, 30.97%), while least cases seen were obstetrics and gynaecology (1049/9880, 10.58). The 5 leading diagnoses at presentation were cardiovascular diseases (1057/9880, 10.62%), Road Traffic Accident (951/9880, 9.6%), Malaria (802/ 9880, 8.1%), Head Injury (408/9880, 4.1%) and Fracture (408/9880, 4.1%). A high percentage of missing a diagnosis (1260/9880, 12.9%) was recorded. There was also a high percentage (19.6%) of other diagnosis (figure 5).

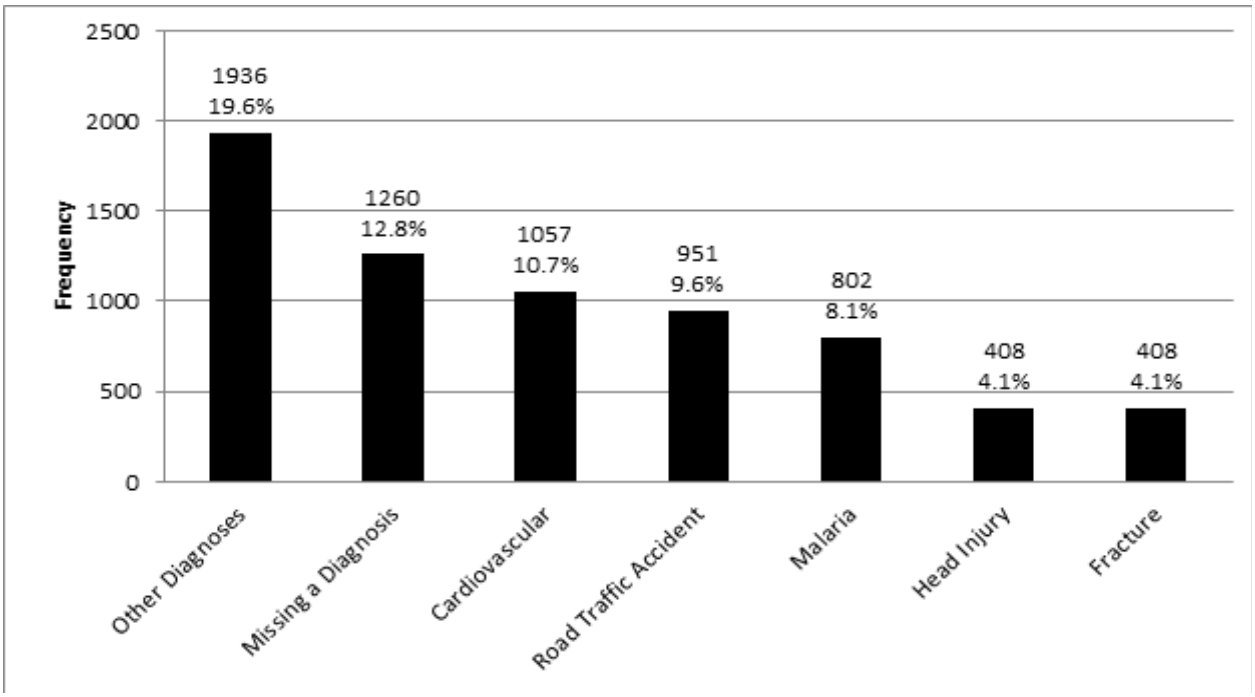

Fig. 5: Leading Presentations at the ED of the Teaching Hospital, January to December 2019

Other Diagnosis

Conditions classified under other diagnoses included schizophrenia, jaundice, upper respiratory tract infection (URTI), bone pain crisis, tetanus, chronic liver disease, immune suppression, peptic ulcer disease, hepatitis, adhesive bowel obstruction, viral encephalitis, diarrhoea, tonsillitis, hernia, retroviral disease, gunshot injuries, foreign body ingestion, sprain, dislocation and suicidal attempt.

Missing a Diagnosis

Out of 9,880 patients that were presented during the year, 1,260 (12.8%) missing a diagnosis were recorded. Of the 1,260 missing a diagnosis, 462 (36.7%) were recorded during afternoon shift, followed by 456 (36.2%) that were recorded during the night shift (figure 6).

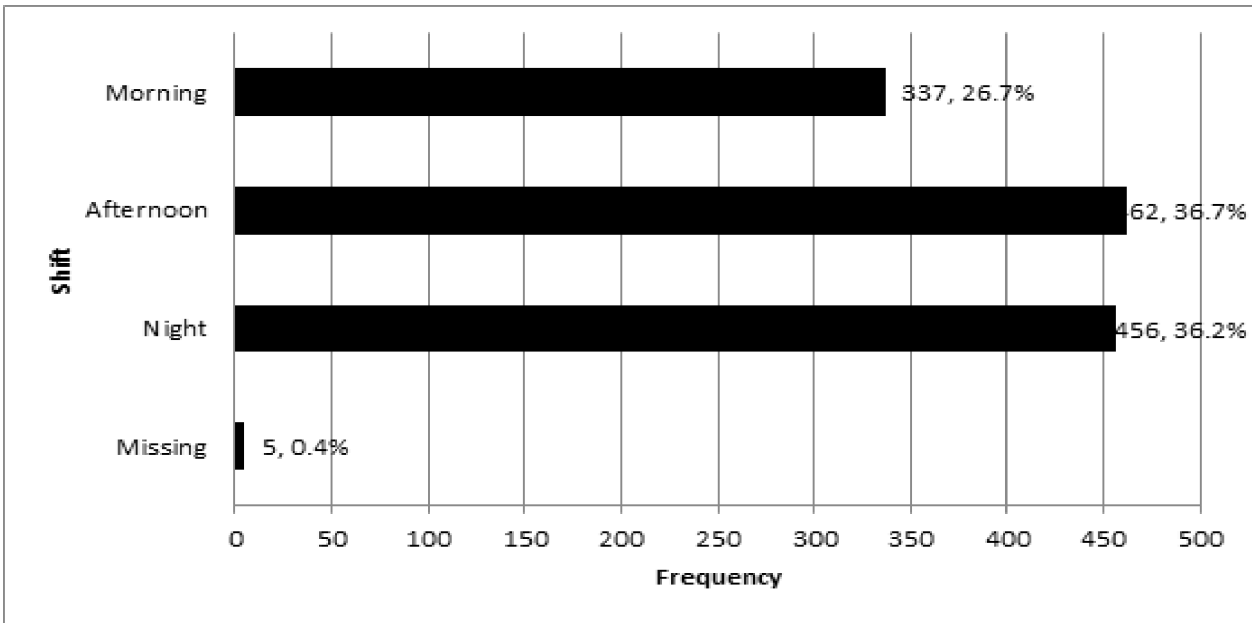

Fig. 6: Shift of Admission of patients with Missing a Diagnosis

Discussion

The key findings of the study were connected to disease pattern, emergency department admission, leading causes of admission and outcomes of emergency department admissions. A large number of patients were attended to at the ED during the study period. The median age of patients who presented at the emergency department for the period under study (January to December 2019) was 38years. This depicts a preponderance of young productive age similar to other studies conducted to determine the ED pattern of admission in Nigeria and Ethiopia [[3,4, 6,7]. The study by Uzoechina, Abiola, Akodu and Tijani [3] revealed that youthful age group constitutes the work force of the population, and they have higher tendency to be involved in stressful and violent life activities which predisposes to various body injuries and health problems. Afuwape, Alonge and Okoje of a research done in 2003 reported a peak age distributionof third decade [8]. Also, the study by Akpa *et al* [4] revealed that age group of 40–59 years constitute the largest proportion of ED admissions. A similar finding was reported by Yosha *et-al* [6] which showed the ED admission at adult emergency department at Tikur Anbesa specialized tertiary hospital, Addis Ababa, Ethiopia mean age of 43.5 ± 17.33years. The study by Woyessa, Dibaba *et-al* [7] also revealed that ED admissions were found to be increasing progressively with peak age at 15–24 years. Hence, this calls for proper emergency care in order to preserve this vulnerable productive age group necessary for the productivity and positive drives in the economy and development of the society.

Another major finding of our study was the near equal male to female ratio of 1: 1.02. This suggested that there was almost an even distribution in the number of male and females that attended the ED in the year under study. This finding is similar to studies conducted in Port Harcourt, Abeokuta and Zaria [4,8,9]. The study conducted in Port Harcourt by Akpa *et-al* showed a gender ratio of 0.99:1. In the Abeokuta study by Ogah et-al in 2014, the male to female ratio was 1: 0.9. Also, the study by Jamoh and colleagues in 2018 [9] from Zaria showed a male to female ratio of 1.3:1. However, in a report by Afuwape, Alonge and Okoje of a research done in 2003 reported a total of 4,674 attendances to the casualty, with a male: female ratio of 1.2:1 and that the third decade was the peak age distribution. This pattern may be explained by the non-discriminatory exposure of both gender to same environment and factors that predispose to acute injuries resulting in emergency presentations,

Evaluation of the pattern of presentation at the ED during the period of the study showed that medical emergencies were the commonest (58.37%). This pattern has been reported by some workers in Nigeria and outside the country [2, 3, 7]. In a study carried out in Lagos, Nigeria [3] also showed that the majority of the cases (53.7%) seen at ED were medical emergencies. Similarly, India reported a preponderance of medical emergenciess (56.08%) at the ED.s [2]. A similar study carried out in Ethiopia [7] showed that medical emergencies were found to be more frequent (45.4%) causes of adult ED admissions. Afuwape *et. al.* reported a predominance of surgical cases (61%) with trauma as the commonest cause of presentation in the Accident and Emergency Department [8]. They also reported that a significant proportion of patients do not require admission. They went on to recommend that doctors in the Accident and Emergency Department must be skilled in basic trauma care.

The outcome of ED admission in our study showed that majority of the cases (42.2%) that presented eventually got transferred to the wards for continued management. Other patients were either discharged home within 24 hours or after a few days of management at ED. The proportion of patients that died at the ED was (7.0%). This relatively low rate of mortality is likely due to a multitude of factors which is an area that requires further studies. However, it is of note that a small proportion (1.0%) were brought in dead. In a study carried out in Lagos by Abiola *et al.*, the mortality rate was 10.1% and the proportion of patients brought in dead was 2.2% [3]. Also another study revealed that the mortality rate was 8.5% [7]. The study carried out in Benin in 2007, a case fatality rate of 2.3% was reported among those with trauma who presented at the ED [11].

The monthly pattern of presentation at ED has been reported by a few workers. In a study carried out in Lagos in 2014, the peak month of admission was in December which the author attributed to the usual increase in activities related to the festive period [3]. In another study, carried out in Zaria in 2018, the rates of admission to the ED was high in the period spanning April to October coinciding with the rainy season [9]. Seasonal variation in admissions to ED was also reported by Isezuo in 2003 [12] in the same geographical region with Zaria revealed that higher rate of admission was also observed in the rainy and hamattan seasons. Our study showed that high rates of admissions to the ED occurred in the rainy season (April to October), with the highest number of admissions occurring in the month of August 2019. It remains to be evaluated how the

rainy season affects the rate of admissions to ED. In his report, Isezuo in 2003 proposed that the increase in hospital admissions among the control group during the wet season may be attributable to increase in the net income of the population arising from farming and the sale of farm products. He also suggested that the increased food supply during the wet season could also reduce expenditure on food items by all categories of the population. Stating that, ultimately, a financial motivation for patronizing orthodox health care services is provided. Beyond financial empowerment, it could be posited that since rainy season is associated with flooding, environmental pollution and infrastructural degradation especially roads; therefore, water borne diseases and road traffic accidents may likely be more at this period.

Worldwide, a wide range of emergency cases are known to present at EDs. On account of this, many EDs are designed to handle all manners of cases from paediatrics to adult, surgical to medical emergencies. In our study (covering adult admissions), the commonest medical emergency was cardiovascular diseases followed by acute malaria fever. Malaria being a non-urgent and the second commonest medical emergency may be as a result of the people's poor understanding of how health care system operates, and inappropriate utilization of emergency department resources because this case can be handled by primary health care. The study carried out in Taiwan about the pre-emergency seeking care pattern shows that more than half of emergency department visits were non-urgent [13]. Thus, strategies must be put in place to reduce non-urgent Emergency department visit.

Emergency cases of major trauma from a motor vehicle crash or a major fall present commonly at EDs. Services that are provided in an emergency department range from imaging such as x-rays and CT-scan, therapeutic interventions such as Percutaneous Coronary Intervention (PCI), and management of fractures and wounds. According to the study carried out by Afuwape *et al* on the pattern of the cases seen in the accident and emergency department of the same hospital in the year 2007 predominant cases presenting at the emergency department were surgical emergencies constituting 61% of the total admission. They attributed this to increase in industrialization and transportation. Trauma related cases constituted 45.1% and road traffic accident was the leading cause of trauma. Similarly, in another study by Thanni and Kehinde carried out in 2003 reported, lacerations and fractures were the most common injuries at the ED evaluated. They went on to report that mortality was due usually to head and multiple injuries. The authors recommended research into appropriate strategies for prevention of injuries, especially Road Traffic Accident (RTA), to be heralded by eestablishment of institutional and regional trauma registries for complete documentation of relevant data [14].

The level of' missing a diagnosis was quite high (figures 2 and 5) constituting about 12% of all cases seen during the period of the study. It was noticed that most of these occur during the afternoon and night shift, when the traffic of cases is either high or the medical personnel appear tired. There is need to augment the work force and to put in place strategic measures that will enhance accuracy of documentation the periods of high patient presentation. There may also be a need to ensure that experienced medical personnel are equally distributed across the various shift periods in order to ensure sustained qualitative services. More importantly, the deployment of electronic medical records system in the hospital, like is being currently done has the potential of significantly improving medical records documentation and eliminating most of the limitations highlighted above. Electronic medical records systems are designed to store data accurately in digital formats, eliminating the need for manual documentation on paper. The system, when fully implemented, will eliminate errors associated with paper health records systems.

Limitations

Since the study was retrospective; under-reporting of cases, missing data on variables such as age, gender, diagnosis of patients, and incomplete documentation were some of the limitations.

Conclusion

Our study revealed a high number of diverse cases at the ED from January to December, 2019. The largest proportion of patients was in the age group of 21 to 40 years (40.9%). Medical emergencies were the commonest (58.4%) presentation, with cardiovascular emergencies predominating. A large proportion of the documentation was missing a diagnosis. There is the need to improve on the accuracy of documentations and efficiency delivery in the Eemergency Department. It is also a pointer to the need to rapidly scale up the current deployment of electronic medical records systems in the hospital.

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