


Spectrum of Orthopedic Emergencies in a Tertiary Center, North-Eastern Nigeria: A 5-Year Appraisal

Yusuf Stephen^{1*}, Shaphat Shuaibu Ibrahim¹, Abubakar Musa¹, Shirama Yakubu Bababa²,
Amur Saidu Ibrahim¹, Ahmad Ja'afar Ahmad¹, Kefas Wida James³

¹Department of Orthopedics and Trauma, Abubakar Tafawa-Balewa University, Bauchi, Nigeria

²Department of Radiology, Abubakar Tafawa-Balewa University, Bauchi, Nigeria

³Federal Teaching Hospital, Gombe, Nigeria

Email: *stephenyusuf@gmail.com

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Abstract

Background: Orthopedic emergencies are one of the leading causes of death globally. In the world scale, road traffic accidents and natural disasters such as earthquakes and the likes are a major thing to prepare for and worry about, however, in our region, road traffic accidents, insurgencies/assaults to poorly managed fractures and infections are our major perpetrators not less disastrous, nonetheless. **Methodology:** We traced the records of all the patients who had emergency surgeries because of an orthopedic emergency condition from the theater records, wards records and folders. We also take numeral records of all the emergency surgeries that were done during the 5-year period of study in the hospital (ATBUTH). All data analysis was done using SPSS version 29. **Results:** For the 5-year period under review, from January 2019 to January 2024, there were a total of 5462 emergency surgical procedures that were done in the Surgery Department of Abubakar Tafawa Balewa University Teaching Hospital, 1366 were orthopedic emergencies constituting about 26% of the total emergencies done within this 5-year period. **Conclusion:** Orthopedic emergencies constitute a significant burden of emergencies seen in ATBUTH Bauchi and this data can be used to prognosticate, prepare and plan to ensure the best outcome of care in this region onward.

Keywords

Orthopedics, Emergency, Morbidity, Mortality, Surgery

1. Introduction

Orthopedic emergencies consist of musculoskeletal incidents requiring urgent intervention of which if delayed can lead to serious debilitating conditions and even deaths. These include multiple injuries, pelvic fractures, dislocations of joints, acute osteomyelitis and septic arthritis and various other traumatic events that can lead to serious bleeding that can lead to exsanguination of the patients if not handled in time. Most of these conditions are related to trauma and road traffic accidents, natural disasters such as earthquakes, tornados, and hurricanes can also lead to these conditions. In north-eastern part of Nigeria, even though natural disasters are not very common, there is a surge in banditry, kidnappings and insurgency, which has increased the incidents of gunshot injuries and IEDs injuries, all of which have constituted a serious rise in the level of orthopedic emergencies seen in this region.

In 2016, it was found out in Korea, that trauma was the major cause of death among individuals less than 46 years of age, accounting for more than 10% of the total deaths in Korea for that year [1]. In north America and the United Kingdom, trauma is also the leading cause of death among children, adolescents and young adults aged range 1 - 44 years and the 3rd most leading cause of death for all ages after heart disease and cancer [2].

Road traffic accidents are the most common cause of death among adolescents and young adults globally [3]-[5].

Road traffic accidents are a major cause of injuries in Africa. It's been estimated that deaths due to road traffic accidents in the African region are 40% greater than those seen in all other countries. And both low- and middle-income countries are about 50% greater than the world average. Even though it is very significant, they are most overlooked here [6]-[8].

Aside from death, which claims a significant number of the young and productive people, many sustain severe injuries with permanent sequelae, these injuries also lead to severe disabilities and debility among those that survived, still hampering greatly their productiveness and causing a significant economic loss for their families and the countries at large [9] [10].

This study aims to look at the spectrum of orthopedic emergencies in order to establish the burden of emergency orthopedic conditions and help in planning and allocation of resources for orthopedic care, which will help reduce the number of preventable deaths due to these conditions and disabilities that may arise from delay or inadequate management of the conditions.

2. Methodology

This is a retrospective study from January 2019 to January 2024. Emergency theater registers, ward record books and orthopedic procedure books of Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH) were traced and the records of all the patients that had emergency surgeries because of an orthopedic emergency condition during the period of study were documented, their folders

were retrieved, and a well-structured questionnaire detailing the patients biodata (age, sex, ethnicity), level of education, occupation, presentation, results of investigations, diagnosis and intervention offered were carefully extracted from the records of the patients. The questionnaire was used as a template to collect the data and other records of each patient. We also took records of all the emergency surgeries that were done during the 5-year period of study in the hospital (ATBUTH), emergencies done by the obstetrics/gynecology and surgery departments were all recorded to have an overview of the total emergencies carried out in the facility during the entire 5-year period. Exclusion criteria: patients who had their emergency surgeries outside of the facility but present with various complications during the study period, or patients who had surgery in the facility but outside of the study period. Inclusion criteria: all the patients who had emergency surgery in ATBUTH within the 5-year study period. All data collected were analyzed using SPSS version 29 for the descriptive statistics of the demographic characteristics of the patient. The Chi-square test and Student's T-test were used to compare the patients regarding the qualitative and quantitative variables, respectively. The adjusted odds ratios with 95% confidence intervals (CIs) were calculated as an estimate of the relative risks when a statistically significant difference was found between the frequencies of the variables.

3. Results

For the 5-year period under review, from January 2019 to January 2024, there were a total of 5462 emergency surgical procedures that were done in the surgery department of Abubakar Tafawa Balewa University Teaching Hospital, 1366 were orthopedic emergencies, constituting about 26% of the total emergencies done within this 5-year period. Among the 5462 total patients operated on, 3641 were males and 1821 females, making a male-to-female ratio of 2:1. Of the orthopedic emergencies, 910 were males and 456 were females, making a male-to-female ratio of approximately 2:1. The demographic data of the patients are as shown in **Table 1**. The emergency orthopedic procedures done within the five-year period included 415 amputations, 160 arthrotomies, 83 debridement and external fixator application, 124 debridement and k-wire application, 67 reductions of dislocations, 103 open reductions and internal fixations, and 414 other procedures which include: tendon repairs, reduction and POP cast application, irrigation and POP backslap application. The commonest cause of injury is road traffic crashes, accounting for about 63.9%, others include fall from height, gunshot, assaults, and sport related injuries (**Table 2**.)

Most of the patients were multiply injured, with associated injuries involving other organs of the body, these include traumatic brain injuries, urethral/bladder injury (mainly seen in association with pelvic fractures), blunt abdominal injuries, and chest injuries (**Table 3**).

Seven hundred and twenty-six (53.2%) of the fractures were open, while 640 (46.8%) were closed fractures. Four hundred and twelve (30%) of the patients had

Table 1. Showing demographic data of the patients.

Demographic Variable	n	%
Sex		
Male	910	66.62
Female	456	33.38
Age		
<30	366	26.78
30 - 54	569	41.68
55 - 74	263	19.27
>74	168	12.27
Occupation		
Housewife	160	11.74
Civil servants	678	49.61
Business	323	23.61
Artisans	114	8.31
Others	91	6.73

Table 2. Causes of injury.

Causes	n	%
RTC	873	63.9
Fall from height	32	2.4
Gunshot	183	13.4
Assault	63	4.6
Sport-related injuries	37	2.7
Others	178	13.0
Domestic accidents		
Occupational hazards/accidents		
Road traffic crash (RTC)		

Table 3. Associated injuries with fractures.

Associated injuries	n	%
Traumatic brain injury	483	35.4
Urethral/bladder	82	6.0
Blunt abdominal injury	63	4.6
Chest injury	75	5.5
None	663	48.5

Table 4. Procedures done.

Procedures	n	%
Amputation	415	30.4
Arthrotomy	160	11.7
Debridement+ Ex-Fix	83	6.3
Debridement + K-Wire	124	9.2
Dislocation reduction	67	4.6
ORIF	103	7.5
Others	414	30.3
Tendon repair		
Reduction + POP cast application		
External fixator (Ex-Fix)		
Open reduction and internal fixation (ORIF)		

gone for some form of intervention, mainly traditional bone setters before coming to the hospital while 954 (70%) came to the hospital straight. Fifty-six patients (4.1%) had crush injuries, 1310 (95.9%) did not have any crush injuries.

4. Discussion

There has been a continual increase in the burden of traumatic long-bone fractures and orthopedics emergencies in our center, with rising cases of gunshot injuries likely due to increased kidnappings and banditry in this region (Northern-Eastern Nigeria) [11]. Twenty-six percent of all the emergency surgeries done in our facility were orthopedics emergencies, about 1366 in the last 5 years. Road traffic accidents constitute the major cause of injury, accounting for about 63.9%, followed by gunshot injuries with 13.4%, other moods of injuries include fall from height (2.4%), assaults (4.6%), sport-related injuries (2.7%) and others (which include domestic and occupational accidents –13.0%). Huda and Gupta reported a 59.72% prevalence of road traffic crash [12], Solagberu *et al.* and Thani and Kehinde *et al.* reported 62.3% and 90.6% prevalence of RTC respectively.

The male-to-female ratio of the orthopedics emergencies was 2:1, this higher preponderance of males is attributed to their riskier behavior, more exposure to traffic and accidents than females, this is also in keeping with findings reported from other studies [13]-[15].

The most frequently seen injuries are fractures, seen in 726 (53.2%) of the patients. Lower limbs are the most commonly affected side, seen in 359 cases (49.5%). Tibia and fibular are the most common bones affected here, seen in 150 (42%). This is in keeping with findings from other studies also [12] [16].

Amputation is the commonest procedure done in our facility, about 415 (30.4%) amputations were done from the total 1366 emergencies taken within the 5 years period under review; causes of amputation range from trauma (mangled extrem-

ity), occupational hazards, assault (mainly affecting the upper limbs) and diabetic foot syndrome (which is the single most common non-traumatic cause of amputation seen in our facility) for traumatic causes of amputation, aside mangled extremity, another reoccurring cause are preventable; neglected limb injuries, traditional bone setter practices/activities [17] [18], understanding these loopholes will be the first step in the direction toward recovery, adequate management and care for both the traumatic and non-traumatic causes of amputation. The second most common emergency was arthrotomy (11.7%), done for septic arthritis, seen as the highest among children, also seen in adults with varying forms of immunosuppression. Of the 12 adults seen with septic arthritis in our facility within the 5-year period; 6 were HIV positive, 4 were sickle cell disease patients and 2 were intravenous drug abusers, showing varying degrees of immunosuppressive conditions among these individuals (adults). The third most done procedure was debridement and K-wire fixation often done for open fractures involving the digits or distal and proximal parts of the limbs. Other procedures are outlined in **Table 4**.

Most fractures, 48.5%, have no associated injuries. For those seen with associated injuries, 35.4% are seen with traumatic brain injury (TBI) as the most frequently seen lesion analogous with limb fractures in our center. Other injuries that were seen, albeit rare, were urethral/bladder injuries, chest injuries, abdominal injuries accounting for 6.0%, 5.5% and 4.6% respectively. Jodoin *et al.* show an increase in the incidence of TBI among patients with isolated limb fractures, more among upper extremity fractures than lower extremity fractures [18], higher rate of TBI in patients with extremity fractures [19]-[21], other associated injuries [22]. Varying association between limb fractures and other severe debilitating injuries such as TBI can be further studied, including the scenarios with higher combination of such traumas, with a view to reducing high-energy accidents and preventing their terrible outcomes. Prognosis and prognostic factors of different cases of multiple injuries can also be studied.

This study is limited in that it heavily relies on already existing data, some of which may be incomplete, or poorly recorded. Some incomplete data had to be taken out of the study. Additional information cannot be added if needed being a retrospective study.

More prospective, multicenter studies will be needed to further establish this burden of orthopedic emergency in this region (north-eastern Nigeria), and Nigeria at large.

5. Conclusion

Orthopedic emergencies constitute a significant burden of emergency surgeries in our center, and these data can be used to prognosticate, plan and prepare for many more years ahead to cope with the rising burden and take proper care of the affected patients.

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Compliance with Ethical Standards

Ethical approval was obtained from the ethical board of Abubakar Tafawa-Balewa University Teaching Hospital, Bauchi to conduct the study.

Authors' Contributions

All authors have been directly involved with the various aspects of the study. We attest to the fact that all authors have participated in the research, read the manuscript, and attest to the validity and legitimacy of the data.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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