Title: Firearm Injuries at Keffi: Observations from a Tertiary Health Facility in North-Central Nigeria.

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ABSTRACT

Background: The occurrence of firearm injury is on the rise both within and outside Nigeria. This has led to a significant increase in the number of casualties presenting to health facilities. This study aims at looking at the magnitude and pattern of injuries sustained from firearms in our centre.

Methods: This is a prospective cross-sectional study carried out over a period of 36 months (January 2016-December 2018) on patients that presented with gunshot injuries. Patients were stabilised and definitive procedures were carried out accordingly. Multi-disciplinary management modality was employed where necessary.

Results: A total of 67 patients were seen comprising of 49 males and 18 females (M:F=2.7:1). The abdomen was far more involved than other regions of the body (27, 40%) followed by the extremities (11, 16%). Procedures carried out include laparotomy (39, 58.2%), thoracostomy (20, 29.9%), wound exploration and debridement (22, 32.8%) as well as fracture stabilization (11, 16.4%).

Conclusion: The extent of firearm injuries from our study is proven evidence that the society at large is endangered. A holistic approach from both government and the citizenry is required in curtailing this trend.

Keywords: Firearms, Injuries, Management, Keffi.

Introduction

Firearm injuries pose a serious threat to the safety of life and property around the globe.[1] In the United States, there is an alarming increase of firearm injuries recorded over the last two decades and this has led to untimely death of many.[2] In Nigeria, the occurrence of firearm injuries has been on the increase from the civil war era to the present age leading to and causing the death and maiming of many people and internally-displacing many. The occurrence of firearm injuries has plagued different geo-political regions of the country. Economic factors, ethno-religious and communal differences are factors that have been implicated in this menace.

This has inflicted financial drain on the government reserves and has also led to undue mortality and emotional trauma among the populace. [3] On this premise, we decided to embark on this study to determine the magnitude of this problem as well as appraise the type of injuries sustained; their management and outcome in the study centre.

Methodology

This is a prospective cross-sectional study carried out over a period of 36 months (1st January 2016- 31st December 2018), on patients that presented with gunshot injuries. Patients were admitted through the emergency unit of the hospital and were assessed and treated in line with Advanced Trauma Life Support (ATLS) protocol. Tetanus prophylaxis was also administered. Baseline investigations like full blood count and serum electrolytes were done. Relevant radiological investigations were carried out as indicated. Definitive procedures carried out include laparotomy, thoracostomy, wound exploration and wound debridement. Post- operative complications were noted and were treated accordingly and patients were discharged home after full recovery. Patients were followed up at the out-patient clinic on appointment. Patients' information were entered into a proforma designed for this study and analysis done using Epi-Info 3.5.1. Quantitative data are presented in frequencies and percentages.

Result

A total of 67 patients presented to the institution. They comprised of 49 males and 18 females (M:F=2.7:1). Their ages ranged between 11-60 years; students and job applicants accounted for more than three-quarter of the patients that presented to the hospital with firearm injuries. Gunshot injuries accounted for the highest number of injuries under penetrating abdominal trauma that necessitated laparotomy during the study period (Table 1).

Thirty nine (58%) of the cases reported occurred during daytime and more than half (42,62.7%) of all these patients injuries were from armed robbery attacks. Forty four (65.7%) of the patients presented to the emergency unit after the golden hours. Other relevant information as regards the injuries sustained are shown in Table 1. Of all the regions of the body, the abdomen was the most commonly involved region (40%) followed by the extremities (16%) [Figure 1]. Laparotomy was the commonest procedure carried out on these patients followed by wound debridement with cast application for injuries on the extremities. Other procedures carried out are as shown in Figure 2. Superficial incisional surgical site infection (23, 34.3%) was the commonest post-operative complication followed by enterocutaneous fistula (11, 16.4%) and abdominal wall wound dehiscence (6, 8.9%). A total of 61(91.0%) patients survived while mortality was recorded in 6 (9.0%) patients. The average duration of hospital stay for our patients was 9.85 ± 9.31 days.

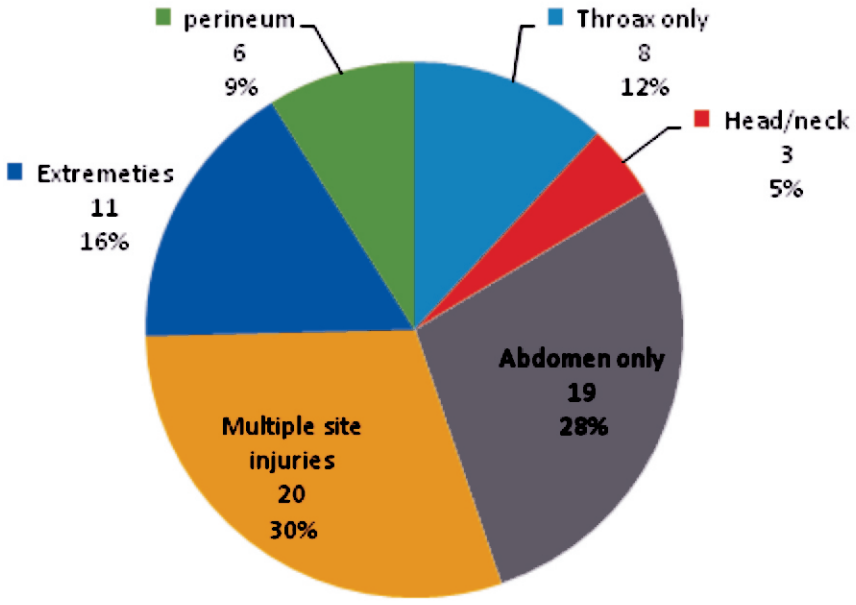

Figure 1: showing different body regions injured.

Table 1: Socio-demographic and clinical characteristics of patients

Parameter	Frequency	Percentage
Age group		
<10	-	-
11-20	9	13.4
21-30	23	34.3
31-40	21	31.3
41-50	6	8.9
51-60	7	10.5
>60	1	1.5
Sex		
Male	49	73.1
Female	18	26.9
Occupation		
Students	21	31.3
Artisans	17	25.4
Job applicants	18	26.9
Others	11	16.4
Time injury was sustained		
Daytime	39	58.2
Night	28	41.8
Event surrounding injury		
Armed robbery attack	42	62.7

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Armed robbery attack	42	62.7
Communal clashes	13	19.4
Religious conflict	10	14.9
Others	2	2.99

Figure 2: showing various procedures carried out on injured patients

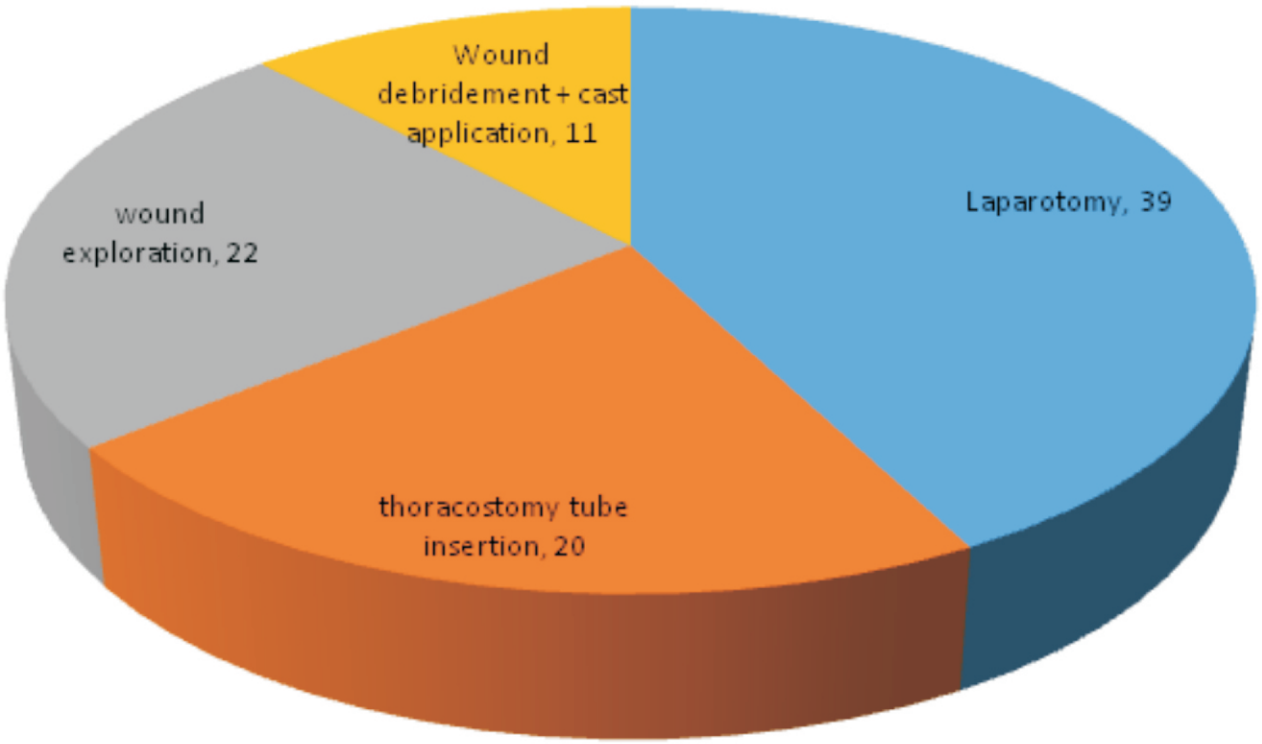
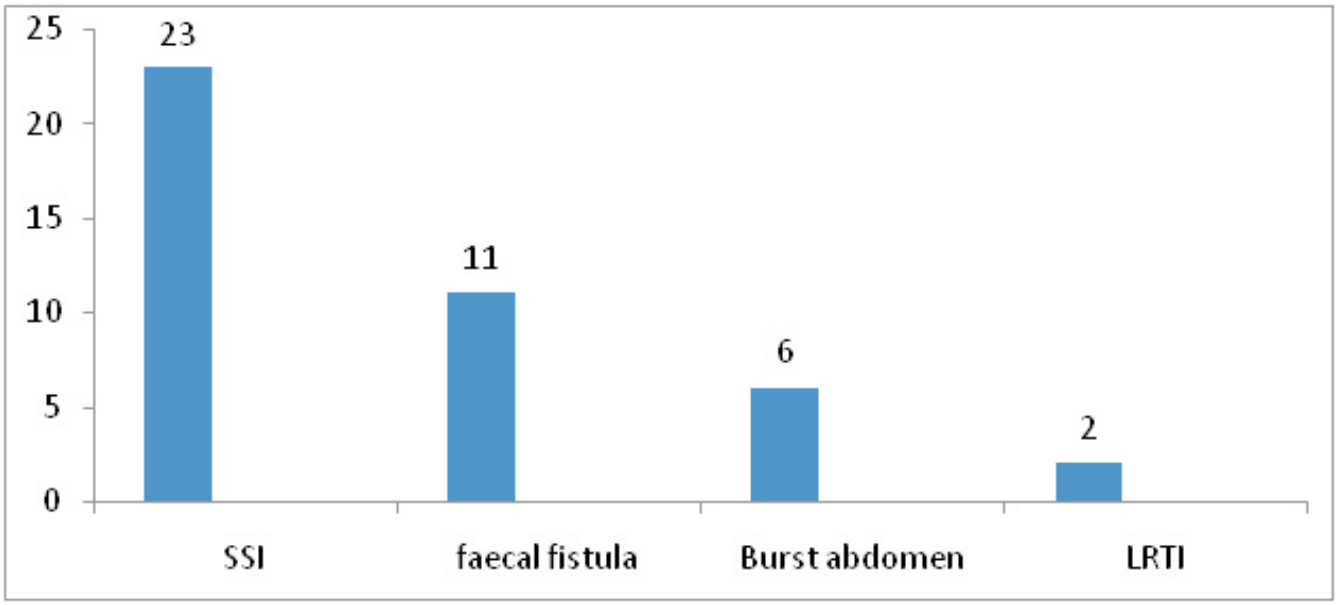


Figure 3: Morbidities that ensued in injured patients.



SSI-surgical site infection

LRTI-Lower respiratory tract infection

Discussion

The age groups observed to be involved in this study is quite similar to that reported from other studies. The modal age group observed in this study is consistent with that of other workers.[4 -8] Male preponderance was also observed and this correlates with reports from other authors as well.[5-10] The involvement of males more than females has been largely attributed to their aggressive and adventurous nature that increases their risk of getting involved in violence.[11] These may be confounded by economic related factors such as poverty and joblessness.[12,13] During the study period, penetrating abdominal trauma accounted for the second most common indication for laparotomy; with gunshot injuries accounting for more than 80% of this category. This implies that one out of every three laparotomies was as a result of firearm injuries because trauma-related peritonitis accounted for a significant number of laparotomies done in this centre during the study period.

More than half (42, 62.7%) of all injuries seen in this study were due to armed robbery attacks. Reports from other regions of the country also have it that armed robbery attacks accounted for the majority of the injuries arising from firearm injuries.[14 – 16] There has been a recent increase in the rate of armed robbery attacks in the country. One may attribute this to the availability of dangerous weapons that have been passed from conflict spots ravaging some regions of the country for some time. This may also be explained by the inflow, proliferation of small arms and light weapons in the region. Other authors have linked police brutality to the rising incidence of these injuries in the society.[17] Some authors have observed the proliferation of firearms to the spill-over effect of the civil war because firearm injuries during the pre-civil war era in Nigeria were rare and largely due to accidental injuries from hunting expeditions.[15]

Recently, authors have tried to link the rising incidence to kidnapping, cult-related activities, involvement in gang and communal clashes and police brutality among others.[18-20] A common denominator to all these factors mentioned is the ailing economy, bad governance and insecurity the country currently faces.[6] Other causes of injuries among our patients included the acclaimed accidental discharges by law enforcement agencies mainly the police; a fact to buttress police brutality that has been earlier mentioned.[21]

More than 60% of our patients presented more than 6 hours (golden hours) after sustaining injuries.This delay in presentation was largely observed to ineffective transportation modality. This has led to unnecessary demise of some patients while others made it at deteriorating state of blood loss (hypovolaemic shock).

The abdomen was found to be more injured compared to other regions of the body. Injuries were noted to have affected both solid and hollow organs. Other workers from this environment have earlier reported similar scenario.[22] Procedures carried out on these patients include splenectomy, colostomy, gastric wall repair, diaphragmatic repair, small bowel and vesical repair. The spectrum of surgeries carried out among these patients is consistent with what other authors have earlier reported.[22, 23] Other regions of the body involved were the extremities and the perineum. On the extremities, the lower limbs were more affected than the upper limbs with injuries to both the soft tissue and the bones(fractures). These observations tend to portray that the intent of such attack was to immobilize and not to kill the victim. Similar studies from other centres have reported that the extremities especially the lower limbs were more involved in firearm injuries.[24,25] Such patients had wound debridement as well as cast application to stabilize the fractures. Some of these patients eventually had open reduction and internal fixation as definitive procedure. Isolated thoracic injuries as well as thoraco-abdominal injuries were also encountered in this study. Patients with such injuries underwent thoracostomy as well as laparotomy.

Post-operative complications encountered include superficial surgical site infection (SSI), controlled low output enterocutaneous fistula (ECF) and burst abdomen. The SSI and ECF were successfully managed non-operatively while the burst abdomen was repaired within 24hours of occurrence. However, there was a patient with recurrent pleural fistula whose computerized tomogram revealed multiple fistulae connecting bowel with the pleural cavity; he was referred to the thoracic surgeon for further evaluation and expert management.

Conclusion

The burden of firearm injuries in our environment is on the rise. Direct and remote causes of these have been highlighted and concerted effort is required to reduce this problem in our society both at present and in the future. We call on government to step-up efforts in preventing firearm injuries by controlling

and reversing the proliferation on small arms and light weapons (SALW).

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