PATTERN OF RADIOGRAPHIC FINDINGS IN PATIENT WITH GUNSHOT INJURIES IN UNIVERSITY OFMAIDUGURI TEACHING HOSPITAL.

[1]Luntsi G, [1]Nwobi IC, [2]Ahidjo A, [3]Bashir T, [4]Bunu B, [1]Mustapha AM, [2]Aminu UU, [1]Nkubli FB, [1]Moi AS, [1]Mathew G

[1]Department of Medical Radiography College of Medical Sciences, University of Maiduguri, Borno State, [2]Department of Radiology, University Maiduguri Teaching Hospital, Maiduguri, Borno State, [3]Department of Surgery University of Maiduguri Teaching Hospital, Maiduguri, Borno State, [4]Department of Orthopaedic Surgery University of Maiduguri Teaching Hospital, Maiduguri, Borno State.

Correspondence and reprint request to: **Luntsi G,**
Department of Medical Radiography College of Medical Sciences,
University of Maiduguri, Borno State.
eMail:- geostuffy@yahoo.com **GSM number:-** +2347035512622

ABSTRACT

Background: Gunshot injuries (GSI) are a global public health problem and causes considerable problem in developing countries.

Objectives: To determine the radiographic pattern of findings of gunshot injuries with its age and sex association and to find out its causes and anatomical part most involved.

Method: A retrospective cross-sectional study was conducted reviewing 397 recordsof patients with gunshot injuries with age range from 6-70 years, from December 2010 to December 2012, in Accident and emergency department of University of Maiduguri Teaching Hospital. Ethical clearance was obtained from the research ethical committee of the institution. Data collected was organized into groups according to age, sex,cause of gunshot injuries, patterns of findings and anatomical part affected. Data was analyzed using SPSS version 16.0 statistical software package, where the mean, percentages and frequencies were calculated.

Result: The result showed that more males 92.7% were affected than the females 7.3% with a ratio of 13:1. More teenagers,within the age group of 11-20 years (20.4%) and young adults with age range from 21-30 years (38.3%) were mostly affected.Secondary assault 84.13% and armed robbery attack 10.8% were the highest cause of gunshot injuries. Fracture 44.8%, soft tissue bullets pellets injury 31.9% were the common findings, with the lower limb 53.6% and the upper limb 30.2% were the anatomical site commonly affected.

Conclusion: The study found that more males were affected than the female with a ratio of 13:1. Extremities were the anatomical site commonly affected, with fractures and pellet injuries as the common injuries. Secondary assault (insurgence) and armed robbery attack were the major causes of these injuries which affected the most active age group (11-30 years) in the society.

Keywords: Pattern, Radiographic, Patients, Gunshot, injuries Findings.

INTRODUCTION

Gunshot injuries are becoming common injuries in Nigeria especially in the northern part of the country with associated increase in morbidity and mortality due the incessant insurgence (secondary assault) political

violence, and accidental discharges(stray bullets). Gunshot injuries (GSI) are a global public health problem and cause considerable problem in developing countries like Nigeria where poverty and violence are common.[1] These injuries occur in both military and civilian settings and cause profound morbidity and significant mortality.[2]

Globally, the incidence of gunshot injuries is onthe increase and has wide regional variations, approaching an epidemic level in other parts of the world. In the United States, approximately 115,000 gunshot injuries with 40,000 deaths occur every year. Similarly, in United Kingdom (UK) gun crimes are causing increasing number of severe injuries. In South Africa an estimated 127 000 people per year seek treatment for gunshot injuries at state hospitals and there are approximately 20, 000 firearm-related fatalities annually.[3] Nigeria, one of the countries in Africa that has maintained a history of peace and political stability since after civil war, has recently witnessed an increase in the incidence of GSI especiallythe Northern part, due to sectarian religious crises, communal clashes, military violence, armed robbery, hunting, political violence, and rarely suicidal attempt.[2]

The sectarian religious crises may be one of the major causes of gunshot injuries in the northern part of the country. It was started in June 2009 in Maiduguri, targeting the military, police and government and religious organizations. As a result, many people were killed and some injured.

victims of this attacks usually come to the radiology department as part of the first line of actions in investigating the site and extent of injury. Imaging modalities routinely used are plain radiography and computed tomography (CT) scan,with plain radiography as the preferred modality ofinvestigationn. This is because plain x-rays are cheaper, readily available, and delivers low radiation dose compared to CT scan although, CT scan has added multiplaner advantages and eliminating superimposition of structures.

Therefore this research is aimed at determining the radiographic pattern of gunshot injuries with its age and sex relation and to find out its cause and the anatomical part commonly affected.

METHOD

A retrospective cross-sectional study was conducted reviewing 397 records of patients with gunshot injuries with age range from 6-70 years, from December 2010 to December 2012, in Accident and Emergency department of University of Maiduguri Teaching Hospital. Ethical clearance to conduct the study was obtained from the research ethical committee of the institution. The information collected include: patients X-ray number, age, sex, cause of gunshot injury, pattern of findings, and the anatomical site commonly affected. Data collected was organized into groups according to age, sex, cause of gunshot injuries, patterns of findings and anatomical part affected. Descriptive statistics was employed in analyzing the data using SPSS version 16.0 statistical software package, where the mean, percentages and frequencies were calculated.

RESULTS

A total of 397 patient's records with GSIs were reviewed, comprising of 368 (92.7%) males and 29 (7.3%) females, with a male female ratio of 13:1.the patient's age ranged from 6-70 years with mean age of 27.96 years.The age range commonly affected were those within 11-20 years 20.4% (n=81) and 21-30 years 38.3%, (n=152), while the least were those within the age group of 61-70 2.5%, (n=10) (Table 1).

Secondary assault was the highest cause of GSIs with 84.1% (n=334), followed by armed robbery attack 10.1% (n=40) while political violence and accidental dischargehad 3.0%, (n=12) and 2.8%, (n=11) respectively (fig. 1).

Fracture was the commonest finding with 44.8%, (n=127), followed by soft tissue bullet pellets injury with 31.9%, (n=127)and the least was subcutaneous emphysema with 0.5%, (n=3) and haemopneumothorax with 0.7%, (n=3), while 11.6%, (n=46) of the cases were found to be normal (Table 2).

The extremities was the most anatomical site affected by GSIs,with the lower limbs being the most affected with 53.6%, (n=213), followed by the upper limbs 30.2%, (n=120). While the least was the spine with 2.0%, (n=8) and skull with 3.5%, (n=14) (fig.2).

Table 1: Age and sex distribution of patients

AGE RANGE	MALE	FEMALE	FREQUENCY	PERCENTAGE (%)
1------10	24	4	28	7.05
11-----20	76	5	81	20.40
21------30	148	4	152	38.29
31-----40	57	7	64	16.12
41-----50	33	5	38	9.52
51-----60	21	3	24	6.05
61-----70	9	1	10	2.51
Total	**368(92.7%)**	**29(7.3%)**	**397(100%)**	**100%**

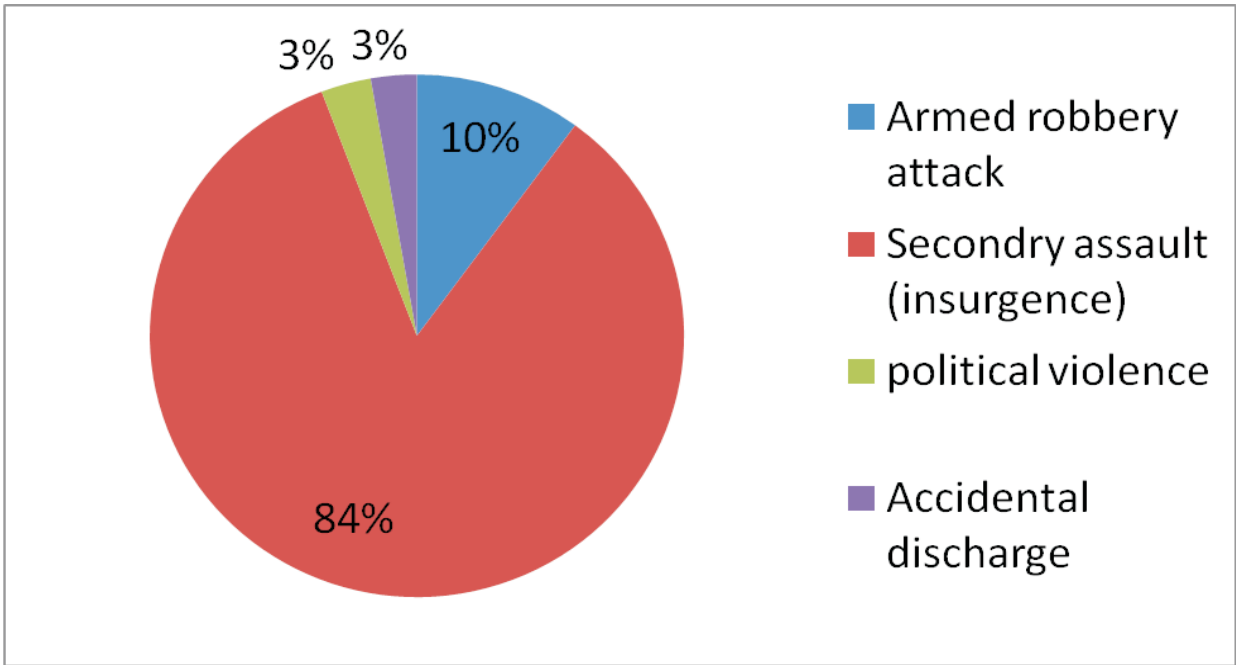

Figure 1: Causes of Gunshot Injury

Table 2: Pattern of findings of GSI

FINDINGS	FEMALE	MALE	FREQUENCY	PERCENTAGE (%)
FRACTURE	12	167	178	44.83
SOFT TISSUE BULLET PELLETS INJURY	4	123	127	31.98
SOFT TISSUE INJURY	4	33	37	9.32
NORMAL	8	38	46	11.59
HAEMOPNEUMOTHORAX	----	3	3	0.76
PLEURAL EFFUSION	1	3	4	1.01
SUBCUTANEUS EMPHYSEMA	-------	3	3	0.51
Total	**29(7.3)**	**368(92.7)**	**397(100)**	**100**

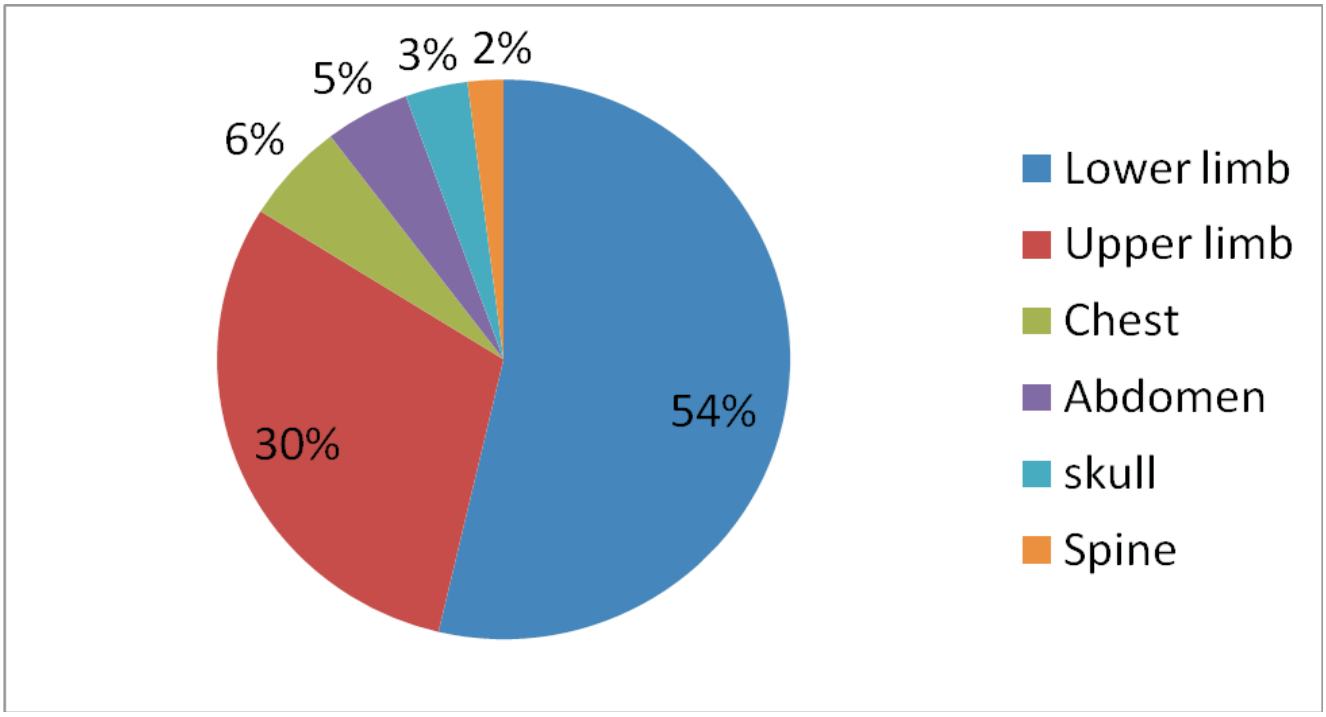

Figure 2: Anatomical Site Affected by GSIs

DISCUSSION

The study found about 368(92.7%) were males and 29(7.3%) females, with male to female ratio of 13:1. This finding may be attributed to the fact that secondary assault (insurgence) & armed robbersare more targeted at the male gender than the female. This is similar with the findings of Chalya et al[4] who found a male to female ratio of 15.8:1 Umaru, *et al,*[1] in a similar study found a male to female ratio of 10.6:1, and Ogunlusi*et al,*[2] also found a male to female ratio of 18:1.

The most affected age group was those within the age group of 21-30 years with (38.29%). This is similar to the findings of Ojo*et al,*[4] who found the most affected age group to be (20-30) years and Aderoumu*et al,*[5] the age of (21-30) years to be most affected. This could be because this age group is the most active and vulnerable age group in the society.

Secondary assault was major cause of the Gunshot injuries with 334 (84.13%). This was found to be higher than what was reported by Umaru et al,[6] that gunshot injuries were found to be 81 (66.9%). This may due to the incessant rise in insurgence within the study locality.

Armed robbery attack accounted for 40(10.08%) from the result of the study. This was found to be lower than what was reported by Chalyaet al,[3] who found arm robbery attack to constitute (84.6%). This may be due to increase in the presence of law enforcement agents within the study locale to contain the insurgence which have inadvertently brought to a barest minimum the incidences of robbery within the study locale.

Accidental discharge accounted for 11 (2.77%) from the result of the study.This is lower than what was reported by Udosenet al,[7] and Ojo et al[4] who reported cases of accidental discharge to be (49%) and (23.5%) respectively.

About 178 (44.83%) of the result was found to be fracture. This is similar to the result obtained by Umaru *et al,*[1,6] who found incidence of fracture in their study to be 45.7% and 62% respectively.

Haemopneumothorax 3(0.76%) and subcutaneous emphysema 2 (0.51%)were fewer than what was reported by chalyaet al,[3] who found Haemopneumothorax accounting for 9 (12.5%) in their study.

Lower limbs 213 (53.62%) was the commonest site of the injuries. This is similar to the reported studies of Ojoet al,[4] ogulunsi et al,[2] and Umaru et al,[6] whose frequencies were 45(37.8%), 28 (73.7%) and 57 (70.4%) respectively. This could be because the injuries were caused by similar things like armed robbery in the process of making their victims to surrender or on the process of trying to run are being targeted on the limb so they could be caught alive.

CONCLUSION

This study showed that the lower limbs were the commonest site of injuries with male to female ratio of 13:1. Secondary assault (insurgence) and armed robbery attack were the major causes of these injuries which affected the most active age group (21-30 years) in the society. Most of the findings were Fracture and soft tissue pellets injuries.

REFERENCE

1. Umaru H, Ahidjo, A, Madziga, AG. Highway Armed robbery: A major cause of Extremities Gunshot injuries in Northeastern Nigeria. The internet Journal of Orthopaedics Surgery 2004; 3(1):
2. Ogunlusi et al. Gunshot injuries in A Nigerian Hospital. Nigerian Journal of Orthopedics and Trauma 2006; 5(2):34-37.
3. Chalya PI, Mchembe, M, Mabula, JB, Kanumba, ES, Gilyoma, JM. Gunshot injuries: A Tanzanian Experience in a Teaching Hospital in the Lake Zone. East and Central African Journal of Surgery. 2010; 16(1): 19-25.
4. Ojo EO, Ibrahim, AG, Alabi S, Obiano, Sk. Gunshot injuries in A Northeastern Nigerian Tertiary Hospital. The internet Journal of Surgery 2007; 16 (2):
5. Aderounmu AO, Fadiora SO, Adesunkanmi AR, Agbakwuru EA, Oluwadiya KS, Adetunji OS. The pattern of Gunshot Injuries in A communal clash as seen in two Nigerian teaching hospitals. J Trauma 2003; 55(4):626-30.
6. Umaru H et al. Fire Arm Violence in Northeastern Nigeria: University of Maiduguri Teaching Hospital Experience. Internal Journal of Medicine and Medical Sciences 2012; 2(8):171-174.
7. Udosen AM, Etimu AU, Ugare GA, Bassey. Gunshot Injuries In Calabar, Nigeria: An increasing societal violence. African Health Sciences 2004; 6(3): 170–172.