

Civilian Gunshot Injuries: Experience from Sokoto, North-West, Nigeria

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Abstract

Introduction: The Proliferation of small arms in the West African sub-region and the activities of insurgent groups and rustlers have caused renewed interest in Gunshot injuries. We aim to document the trend and outcome of such injuries in our sub-region.

Methods: It was a prospective study of cases of gunshot injuries admitted at the University Teaching hospital over a period of 18 months. Parameters analysed included patients' bio-data, region of the body affected, mechanism and source of projectile, clinical presentations and short term outcome. Statistical analysis was done with IBM SPSS 20. Level of significance was $p < 0.05$.

Results: A total of 43 patients were seen with a mean age of 33.76 ± 10.59 . There were 42(97.7%) males and 1(2.3%) female. The victims were mostly farmers (25%), professional drivers (13.6%), Students (11.4%). The body region affected were the lower extremity (36.4%), upper extremity (27.3%), Most of the cases were from armed robbery attack (77.3%) and Assaults (13.6%). Low velocity weapons like Dane guns were the common sources of projectile 95.3%. High velocity weapon like AK 47 was used in 4.7% of cases. Majority of victims were shot at closed range (86.4%) and 79.5% were stable on presentation. Intervention carried out included wound debridement (65.9%), external fixation (23%), and chest tube drainage (9.1%). The outcome was such that 68.2% survived without residual deficit while 31.8% survived with residual deficit.

Conclusion: Gunshot injuries were mainly from armed robbery attack using low velocity weapon with farmers being the most victims. Strict regulations in the acquisition and use of light firearms would reduce the incidence of armed robbery and gun related violence in our sub region.

Keywords: Gunshot injuries; Civilian; Northwest Nigeria

Introduction

Gunshot injuries (GSI) amongst civilian population are a common phenomenon globally and Nigeria is no exception. The proliferation of small arms in the sub-Saharan Africa coupled with the activities of insurgent groups, cattle rustlers and armed robbers has caused renewed interest in GSI amongst Trauma Surgeons. The aetiology of GSI varies from developed to developing countries and also within the different regions in Nigeria. While terrorism related and Suicidal causes abound as causes of GSI in developed countries, armed robbery attack, accidental discharge and assaults are common causes in developing countries [1]. In 2010, guns took the lives of 31,076 Americans in homicides, suicides and unintentional shootings. This is the equivalent of more than 85 deaths each day and more than three deaths each hour. Also in 2010, 73,505 Americans were treated in hospital emergency departments for non-fatal gunshot wounds. Firearms were the third-leading cause of injury-related deaths in America in 2010, following poisoning and motor vehicle accidents [2]. The causes of gunshot injuries in Nigeria like many other African and developing countries include communal clashes, sectarian religious crises, military violence, armed robbery, hunting, political violence, students' cultism activities and rarely sporting and suicidal attempt [3]. Gunshot injuries is reported to be the second commonest cause of death per 1000 in Transkei region of South Africa [4]. Reports on Gunshot injuries from various regions in Nigeria shows that armed robbery attack on highways and at home is the major aetiological factor [5-8].

Patients and Method

It was a prospective study of cases of gunshot injuries seen and treated at the Trauma Centre of a tertiary hospital in Sokoto, Northwest Nigeria over a period of 18 months from January 2014 to June 2015. An observer administered questionnaire was used to gather data on patients' bio-data, region of the body affected, mechanism and source

of projectile, clinical presentations and outcome. Cases of gunshot injuries that died before presentation were excluded and those that presented for treatment were usually accompanied by law enforcement agents. Gunshot injuries were notifiable cases and were reported to the supervising Consultant. Statistical analysis was done with IBM SPSS 20 and level of significance set at $p < 0.05$ with results presented in tabular and graphical forms.

Results

There were a total of 43 patients seen with age range of between 15 and 70 years with a mean age of 33.76 ± 10.59 . Majority of those affected were between the ages of 21 and 30 years (46.5%) followed by those between 31 and 40 years (30.3%) (Figure 1). There were 42(97.7%) males and 1(2.3%) female (Figure 2). The victims were mainly farmers (26%), professional drivers (14%), Students (12%) (Figure 3). The body regions affected were the lower extremity (37.2%), upper extremity (25.6%), Head and Neck (9.3%), more than two regions (11.6%) (Table 1). The nature of the extremity injuries included soft tissue, fractures and fracture-dislocation. Majority of the cases were from armed robbery attack (79.1%) and Assault (11.6%), accidental discharge (7.0%) (Figure 4). Low velocity weapons like Dane guns were the common sources

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of projectile in 95.3%. High velocity weapon like AK 47 were used in 4.7% of cases. Majority of victims were shot at close range (86.4%) and 79.5% were stable on presentation. Intervention carried out included wound debridement (69.8%), external fixation (18.6%), and chest tube drainage (9.3%). The outcome was such that 67.4% survived without residual deficit while 32.6% survived with residual deficit. No death was recorded on admission. Chi square test showed a statistically significant

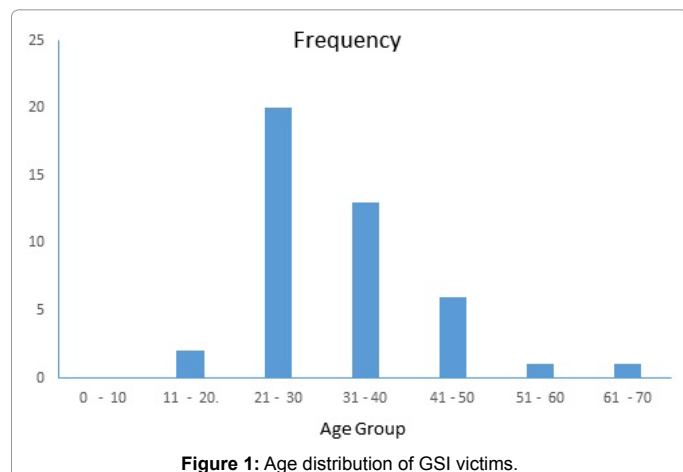


Figure 1: Age distribution of GSI victims.

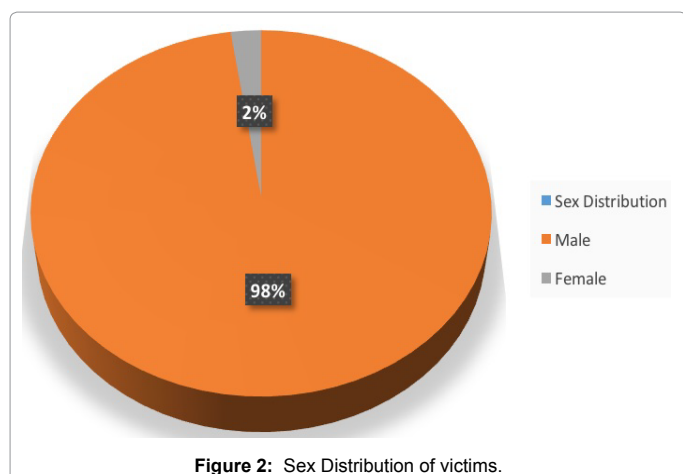


Figure 2: Sex Distribution of victims.

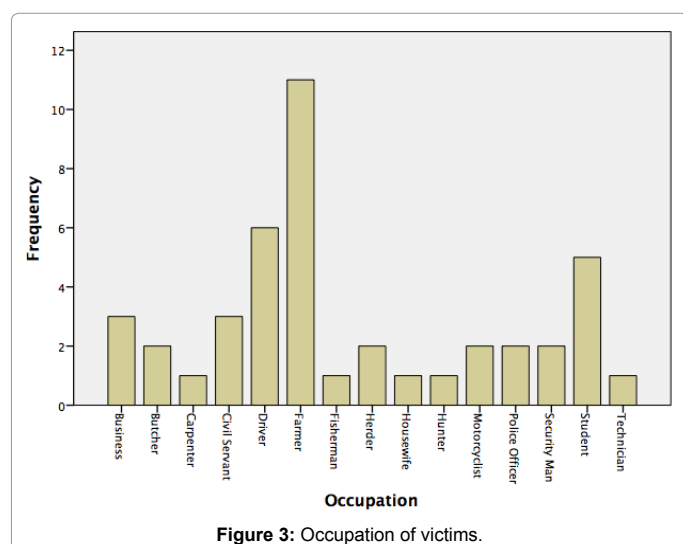


Figure 3: Occupation of victims.

Body Region	Frequency	Percentage
Head and Neck	4	9.3
Chest	3	7
Upper Extremity	11	25.6
Abdomen	3	7
Lower Extremity	16	37.2
Pelvis	1	2.3
More than two regions	5	11.6
Total	43	100

Table 1: Region of body affected.

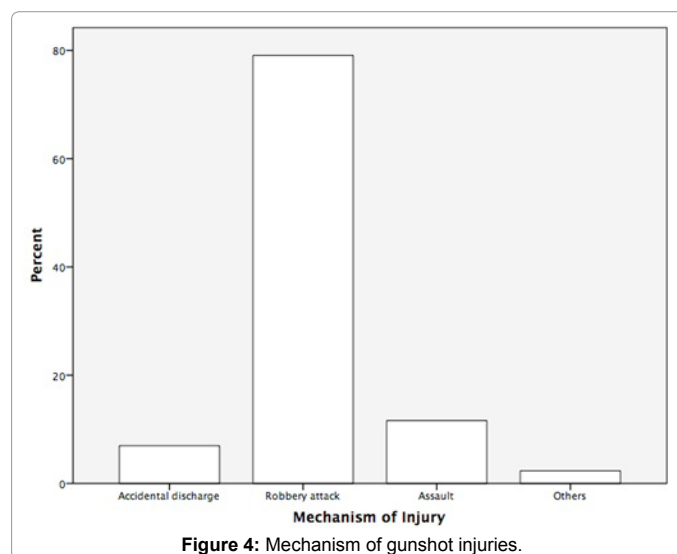


Figure 4: Mechanism of gunshot injuries.

	Outcome					P- value
	Survived with residual	Survived with no deficit	Residual deficit	Total	Chi-Square	
Source of Projectile						0.04
High velocity	2	0	2	4.24		
Low velocity	12	29	41			
Distance from gunshot						0.06
Close range	11	28	39	3.53		
Long range	3	1	4			
Intervention						0.10
Chest tube	0	4	4	7.91		
Debridement with cast	1	0	1			
External fixation	2	6	8			
Wound debridement	10	19	29			
Wound Exploration	1	0	1			

Table 2: Cross tabulation of Outcome with Source of missile, Distance from gunshot and intervention.

relationship between the source of projectile ($p=0.04$) and outcome while there was no statistical significant between the distance from the source of projectile ($p=0.06$), and intervention ($p=0.10$) with outcome (Table 2). Complications of wound infections, nerve palsy was seen.

Discussion

The study area which is located in the extreme North western part of Nigeria has been relatively peaceful and crime free. The 43 patients seen in our institution over an 18 months' period is comparable to the numbers in some other cities in Nigeria over a similar time frame. This obviously does not give a true incidence of Gun related violence in our

sub-region as the study was a single centre based study and it did not include those that died before reaching the hospital. Nigerian extant laws require that police report, are produced in cases of gunshot injuries hence most are usually managed in government owned institution. In Abeokuta, South west, Nigeria, 46 patients were seen over a 2 year period [1]. The higher male preponderance in our study was similar to that seen in other studies in cities like Abeokuta, North west, Maiduguri and Kano, North east and North west respectively [1,3,5,6]. The overwhelming sex discrepancies in favour of men is a reflection of the cultural norms where men who are bread winners dominate all spheres of life. The predominant age group seen in our study was similar to that in other parts of Nigeria. The reasons for this is not far fetched as these are the most productive age group and are more involved in socio-political and economic activities.

Armed robbery attacks accounted for most of the cases of Gunshot injury in our study. This was also the findings in Kano, Irrua and Maiduguri but was in contrast with predominance of stray bullet/accidental discharge incidents found in Calabar, South-south, Nigeria [6-9]. Proliferation of small arms, dwindling economic prospect and job losses coupled with the activities of insurgents in the North eastern part of Nigeria has resulted in the activities of armed bandits and kidnappers. Majority of the victims involved in gun shot injuries were farmers and professional drivers. Farming is a major occupation of the people in this region and they are thought to be economically empowered and they are therefore more likely to be victims of armed robbery attacks. Another explanation for the high incidence in farmers could be the recurrent clashes between herdsmen and farmers over grazing rights and cattle rustling. Highway armed robbery attacks involved commercial drivers who are disposed of their belongings and money. Other aetiological factors noted were assault from communal dispute. Accidental discharge from poor weapon handling was seen in police officers and this involved high velocity weapons.

The pattern of injuries noted involved mainly the extremities and this would indicate that the intention of the assailants was to maim rather than kill. This was also the findings in Abeokuta, Maiduguri, Kano, Calabar, Irrua, and Gombe studies [1,7,9-12], but differs from findings from Lagos and Benin in Nigeria and Durban, South Africa where abdominal injuries predominated [13-16]. It should be noted that we did not witness any religious riots during the period this study was carried out hence the pattern of injuries were predictable. Craniofacial injuries have been reported following civil unrest and riots as intention are meant to kill [17].

Most of the victims were shot by low velocity weapon and this had a statistical significance on the outcome. High velocity weapons have greater kinetic energy and consequent potential to destroy tissue as a result of the temporary cavitation induced once the bullet becomes deformed. Bullet fragmentation and bony fractures are predictors of increased wound severity whereas low velocity bullet causes damage limited to the bullet's path mainly as a result of localized crush injury [18,19]. The distance from the source of weapon and the intervention done had no statistical significance on the outcome. Life and limb saving procedures like chest tube insertions and external fixations were amongst the interventions carried out since most of the injuries were to the extremities. Outcome was good as those that had residual deficit in the short term had wound infection, nerve palsy and chronic osteomyelitis.

Conclusion

Gunshot injuries are a source of violence in our sub region targeting economically endowed individuals. Although the outcome appears good with low velocity weapons, strict regulations in the acquisition and use of light firearms would reduce the incidence of armed robbery and gun related violence in our sub region.

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