

# Pattern at Presentation of Extremity Gunshot Injuries in Warri, Nigeria

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## ABSTRACT

### BACKGROUND

Gunshot injuries (GSI) in civilian populations are becoming more common worldwide. The result is significant morbidity, mortality and disability particularly among the young active productive males who are often the most frequently affected. The wide spread socio-economic down turn and small arms proliferation particularly in developing countries might be partly responsible for this.

This study aims to further highlight the pattern, including aetiology and the emerging significance of GSI in Warri pointing out the need for urgent and appropriate action by all concerned.

### METHODOLOGY

A prospective study of consecutive gunshot injury patients who presented at the Central Hospital and two other private health facilities in Warri between 1<sup>st</sup> of January and 31<sup>st</sup> of December, 2011. Relevant data were collected using previously prepared forms, collated and analysed with SPSS version 17.

### RESULTS

Eighty five patients presented with GSI during the study period. This consisted of 78 males and 7 females giving a male: female ratio of 11.1:1. The mean age of patients was 34.23+13.22 years with the most frequently affected age group being that of 16-30 years. Most patients (51.76%) were shot by armed robbers, traders being the most frequently

affected (28.2%). Ninety six injuries were sustained by the 85 patients with 52 fractures. High velocity weapons were used more frequently.

### CONCLUSION

Gunshot injuries are common in Warri. Armed robbery is frequently responsible. Practising trauma surgeons here need to be abreast with modern treatment modalities for GSI and our health facilities should be equipped to meet the challenges. There is also need for improvement in the socio-economic conditions of the people, youth reorientation and empowerment programmes and more proactive measures towards addressing security challenges.

**Keywords:** Gunshot injuries; Extremities; Fractures.

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### INTRODUCTION

In recent years, the incidence of civilian gunshot injuries has increased considerably worldwide [1-9] In the United States of America, it is the commonest cause of death in young African-American males and in the United Kingdom, there has been a 30% increase in firearms associated crimes in recent years [10].

In both military and civilian settings, gunshot injuries cause profound morbidity and mortality on the victims which in many studies have been observed to largely affect the young, active and productive age groups in the society [1, 2, 4-8, 11-15] No doubt, the

negative socioeconomic impact of these injuries in this group of young people in any nation is colossal, especially in Africa and other third world nations where resources are scarce and often mismanaged with misguided priorities [5,11,16]

In many developed countries like the United States of America (U.S.A) and Switzerland, civilians are allowed legally to carry arms and there tends to be more strict control and forensic monitoring of such arms when used in committing crimes. Most civilian gunshot injuries in these climes have been observed to be due to homicides and suicide attempts [7, 9, 17].

However, in most places in Africa including Nigeria, most guns held by civilians are possessed illegally. The surge in firearms-related injuries in these climes have been attributed by many authors to poor socio-economic conditions resulting from recent economic down turn coupled with various agitations in different parts of Africa including Nigeria that has led to proliferation of small arms [2,4,5,8,11]. Gunshot injuries in these parts of the world have been reported to be largely as a result of armed robbery and other related crimes like political thuggery and communal clashes [2, 4, 5, 8, 11].

Based on the upsurge of gunshot related violence crimes in Nigeria, there is need for trauma surgeons practising here to become more conversant with the pattern and presentation of these injuries and current modalities of management.

Several studies have attempted to document the pattern of the injuries in various parts of Nigeria and beyond [1,2,4,6,8,11,12,18]. However, no such studies has been carried out in Warri in spite of its high crime rate and epidemic level of use of firearms as frequently reported in the news.

The aim of this study is to observe and report the pattern at presentation of gunshot injuries in the city of Warri, with a view to alerting

practising Surgeons, policy makers and security authorities on the enormity of the problem and make recommendations on the possible way forward.

## METHODOLOGY

This is a descriptive prospective study of consecutive gunshot injury (GSI) patients that presented at the Central Hospital Warri, and two other private hospitals in Warri metropolis. The Central Hospital, Warri is a level 2 hospital that receives referral from other peripheral hospitals largely from Delta south and Central Senatorial districts including the neighbouring Bayelsa state. The private hospitals also received a reasonable number of GSI patients during the study period.

Specially prepared forms were used to collect relevant data from patients at presentation from January 1<sup>st</sup> to December 31<sup>st</sup> 2011. Data collected included age, sex, religion, circumstances surrounding the shooting, type of gun used, range of shooting, injuries sustained etc. Data were recorded, collated, analysed and presented in form of tables, percentages, charts and averages. The Statistical Package for Scientific Solutions (SPSS) version 17 was used to perform part of the data analysis.

Permission to carry out this study was obtained from the management of the hospitals used as there were no standing ethical committees in these hospitals at the time of carrying out this study.

## RESULTS

A total of 85 GSI patients presented at the 3 hospitals during the study period (62 patients from Central Hospital Warri, 14 and 9 patients respectively from the two private hospitals). There were 78 males and 7 females giving a male: female ratio of 11.1: 1.

The ages of the patients ranged from 6 – 66 years with a mean of  $34.23 \pm 13.22$  years. The age groups with the highest number of victims were those of 16-30 years [36 patients -

42.4%), and 31-45 years [29 patients - 34.1%) (Figure 1).

Forty four patients (51.8%) of the GSI victims in this study were shot by armed robbers during armed robbery attacks while 17.6% were suspected robbers shot by the police and other security agents during exchange of gun fire. Thus, armed robbery-related cases constituted 69.4% of the GSI cases. Nine of the injuries were due to accidental discharge. Table 1 shows further details.

Many of the GSI victims were traders (28.2%) and students (20%) ( Table 2).

Most of the victims were Christians (92.9%). Five point nine per cent were Muslims and 1.2% traditional worshippers.

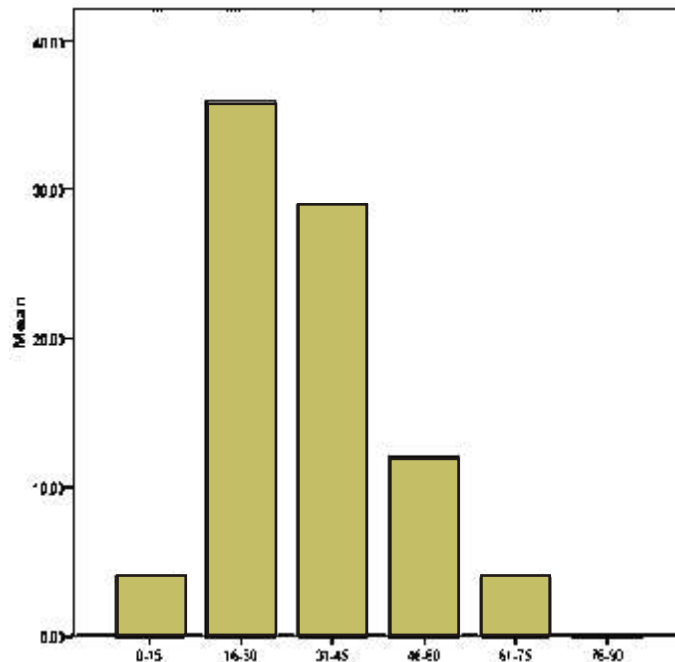
Most of the victims(48.2 %) were shot with high velocity (>600m/sec) weapons, while 19 patients (22.4%) were shot with low velocity weapons (< 300m/sec). Seven per cent (6 patients) were shot with intermediate velocity weapons (300-600m/sec) while, the calibre of weapons used were unknown in the remaining 19 patients (22.4%).

About 40% of the patients were shot at close range (<1.2m), another 40% were shot at intermediate range (1.2-3.6m). Fifteen victims (17.6%) were shot at long range (>3.6m) while the range of shooting in 2 patients was unknown.

A total of 96 injuries were sustained by the 85 patients in this study. The right lower limb was the most frequently injured occurring in 36.5% of the injuries (36 injuries), followed by the left lower limb in 30.2% of the injuries (29 injuries). Table 3 shows further details. Other associated injuries were to the abdomen in 2 cases and pelvic/perineal region (1 case involved the testes) in 2 cases.

All the patients (100%) had soft tissue injuries involving the skin, subcutaneous tissues and muscles. Fifty two bony injuries were sustained by the 85 patients. The most frequently fractured bones were the tibia in 15 patients (28.8%), and fibula in 7 patients (13.5 %). The femur and humerus were each fractured 6 times (11.5% each) ( Table 4).

There were 4 cases of major vascular injuries (1 popliteal artery, 1 posterior tibial artery, 1 radial artery and 1 ulna artery injuries) and one major nerve injury (radial nerve).



**FIGURE 1. AGE DISTRIBUTION OF GSI PATIENTS IN YEARS.**

**Table 1. Circumstances surrounding GSI (aetiology)**

AETIOLOGY	NO. OF PATIENTS	PERCENTAGE
ARMED ROBBERY	44	51.76%
POLICE SHOOTING (CRIME SUSPECTS)	15	17.6%
ASSAULT/RIOTS/COMMUNAL CLASHES	9	10.6%
ACCIDENTAL DISCHARGES	9	10.6%
KIDNAPPING	4	4.7%
STRAY BULLETS	2	2.4%
CULTISM	2	2.4%

**Table 2. Occupation of GSI victims.**

OCCUPATION	NO. OF PATIENTS	PERCENTAGE
TRADING/BUSINESS	24	28.2%
SCHOOLING	17	20%
ARMED ROBBERY/CRIME SUSPECTS	15	17.6%
SECURITY AGENTS (POLICE/ARMY)	5	5.9%
ARTISANS	5	5.9%
DRIVING	4	4.7%
CIVIL SERVANT	4	4.7%
BANKING	3	3.5%
OIL/GAS WORKERS	2	2.4%
HUNTING	2	2.4%
APPLICANT	2	2.4%

**Table 3. Parts of body affected.**

BODY PART	NO. OF INJURIES	PERCENTAGE OF TOTAL
RIGHT LOWER LIMB	35	36.5%
LEFT LOWER LIMB	29	30.2%
RIGHT UPPER LIMB	13	13.5%
LEFT UPPER LIMB	15	15.6%
ABDOMEN	2	2.1%
PELVIS/PERINEUM	2	2.1%
<b>TOTAL</b>	<b>96</b>	<b>100%</b>

**Table 4. Bony injuries (fractures)**

BONE	NO. OF TIMES FRACTURED	PERCENTAGE OF TOTAL #S
TIBIA	14	28.8%
FIBULA	7	13.5%
FEMUR	6	11.5%
HUMERUS	6	11.5%
CARPUS/HAND BONES	7	13.5%
FOOT BONES	4	7.7%
ULNA	3	5.7%
RADIUS	2	3.8%
CLAVICLE	2	3.8%
PELVIS	1	1.9%
<b>TOTAL</b>	<b>52</b>	<b>100%</b>

## DISCUSSION

That GSI has increased in significance over the years in civilian populations as an important source of mortality, morbidity and disability especially among young able-bodied males worldwide has been alluded to severally by various authors[1,3,4,8,11,13,14,16]. In the U.S. alone, about 500,000 missile injuries are said to occur annually with about 50,000 deaths [16].

Eighty five cases of gunshot injuries were recorded in the hospitals used in this study during the study period of one year with a male : female ratio of about 11:1. This high preponderance of males has been the pattern in several previous studies over the years. The ratio however varies from study to study ranging from 7.7:1 to 19:1 in different studies[1,2,4,6,7,8,11,15]. The male gender is more adventurous, gets involved in more dangerous activities including armed robbery, cultism, political thuggery, militancy etc. that exposes him more to the chances of being shot at. The typical armed robber sees the man as the major threat to the success of his activities and would rather shoot at him than the woman. In addition, many assailants have

sympathy for the female gender and see her as the weaker sex, harmless to their course.

About 93% of the GSI victims in this study were Christians. This is not surprising, considering the fact that the area of the study is largely occupied by Christians. Religion probably does not contribute to the likelihood of being shot in this area, religious riots being rare in Delta state.

Business persons/traders (28%) and students (20%) were more affected in this study than other occupational groups. Umaru et al[4]in Maiduguri, also reported that traders were more affected in their study followed by civil servants while Dada andAwoyomi[11] in Lagos observed that policemen and traders were the most frequently affected in their study. Many of these traders are robbed on the highways while going to the places they transact their businesses. They are often major targets as they carry large sums of money while travelling on the roads. There is thus need to improve on the security situation on our roads to safeguard lives and properties. In addition, traders and other travellers should be encouraged through public enlightenment campaigns on the need to take advantage of the recently introduced Central bank cashless policies like internet banking to transfer large sums of money during business transactions instead of carrying cash around which attracts the armed robbers.

The bulk of the GSI victims (76%) recorded in our study fell within 16 – 45 years of age. This is similar to the findings in many other previous studies that the young active and able-bodied males are the ones most frequently exposed to gunshot injuries[1,4,6,7,8,11,12]. The implications of this on any society are not farfetched. This age group is usually the most productive in any nation and any activity that leads to their being killed and maimed such as involvement in violent crimes and exposure to gunshot injuries definitely affects national productivity and economy negatively. The need to curb the trend cannot therefore be overemphasized. Improvement in the socioeconomic conditions of living of the

people, total reorientation of the psyche of the youths, beefing up security in the nation and improvement in the criminal justice system will help to alleviate the problem of armed robbery in particular and other social vices that predispose to GSI.

Over 50% of the GSI victims were shot by armed robbers with another 17.6% being armed robbery suspects shot by law enforcement agents during confrontations. Many authors from Nigeria and other African countries have similarly reported armed robbery as the commonest cause of gunshot injuries in previous studies [2,4-8,11]. This however contrasts with reports from Western developed countries where the commonest cause of GSI is reported to be homicide [9,17]. Poor socioeconomic conditions emanating largely from bad and corrupt leadership, proliferation of small arms from conflicts and agitations coupled with poor security are probably responsible for the high incidence of armed robbery in Nigeria and other African countries.

High velocity weapons were the most frequently used wounding weapon in this study. This agrees with the findings of Yinusa and Ogirima[6] in Lagos, Nigeria. It however contrasts the findings in many other previous studies in civilian populations where they observed that the low velocity guns were the most frequently used [1,5,7,11,15]. The frequent use of high velocity weapons like rifles and sub-machine guns observed in this study is nevertheless, not totally unexpected. Warri, the study area, has for some time now been a flashpoint for violent crimes including; kidnappings, militancy, resource control agitations, illegal oil bunkering etc, many of which are carried out in open confrontation with the police and other law enforcement agents. These have led to the illegal acquisition of high calibre weapons in some cases even superior to those carried by the police during confrontations.

The recent amnesty programme by the federal government of Nigeria (although some have expressed their reservations about it) is a step in the right direction geared towards

reclaiming these arms. However, more of the youths need to be encouraged to embrace this programme in addition to spreading it to areas not previously covered. Creation of more jobs for the teeming population of youths and a total reorientation of the societal psyche will also help to ameliorate this problem.

Both lower limbs were injured in over 66% of the injuries sustained by GSI victims in our series. This agrees with the findings by some previous authors that the lower limbs were the most frequently injured part of the body in gunshot injuries in this part of the world [1,7,15]. The aim of shooting here most times especially during armed robbery and such similar crimes is usually not to kill but to frighten and demobilise the victims[1,7,15].

The percentage of GSI patients with fracture tend to vary from study to study. Chalya et al[7], from Tanzania and Umaru et al[4] from Maiduguri in Nigeria, reported 45.7% and 45.0% respectively in their studies, while Obalum et al[2] and Dada and Awoyomi[11] both from different centres in Lagos, Nigeria, observed 35% and 37% of GSI fractures respectively. About 52% of the GSI in this study resulted in fractures in addition to soft tissue injuries. This figure is relatively higher than those reported by these authors. It has been argued that high velocity weapons have more tendency to produce fractures in addition to producing more soft tissue damage due to the higher energy released to the tissues compared with low velocity weapons. The relatively higher percentage of fractures observed in this study is thus probably due to the higher frequency of the use of high velocity weapons recorded here compared with other quoted studies above[2,4,7,11].

**Limitations of The Study:** A major limitation of this study is that it is hospital based and so may not actually represent the actual number of gunshot injuries sustained in the city during the study. Only three hospitals out of many were involved in this study and many GSI may never get to the hospital especially those that affect the armed robbers themselves for fear of being apprehended by the police. In addition the traditional bone

setters also treat a large chunk of GSI patients as they claim to be able to remove all the pellets from wounds through incantations and the use of spiritual powers. The figures in this study may thus not reflect the true magnitude of the problem.

## CONCLUSION

Armed robbery and other violent crimes remain the most important conditions leading to gunshot injuries in this study and this is similar to findings in several other studies in different parts of Nigeria. There is need for government and other policy makers to take proactive steps like improved security, job creation for youths and general improvement in the socio-economic conditions of the people to alleviate this problem. Health facilities in this area should also be equipped with up to date human and material resources to treat GSI effectively.

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