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Full Length Research Paper

Fire arm violence in northeastern Nigeria: University of Maiduguri Teaching Hospital experience

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Background: Gunshot injuries (*GSI*) in Africa are often the manifestation of the twin evils of poverty and violence, frequently associated with profound morbidity and significant mortality. The study was aimed at evaluating the current pattern and presentation of gunshot injuries in Nigerian Northeast sub region.
Patients and methods: This was a prospective study of gunshot injuries in a Nigerian teaching hospital. The study was conducted between March 2011 and April 2012, data extracted included patients demographic data, causes of gunshot injury, locations where victims were attacked, type of guns used and site of injuries. Data obtained was analyzed using SPSS version 16.0.
Results: Total number of patients was 121 and male: female ratio was 9:1. Eighty seven (71.9%) were below the age of 40years.Gunshot injuries was inflicted by Unknown gunmen(insurgents) in 81(66.9%) and the weapon of attack was Rifle/AK 47 in 98 (80.9%).The most frequently injured sites were the extremities 81(66.9%) and abdomen 24 (19.8%).
Conclusion: Gunshot injuries occurred most frequently among young adult males, the limbs were the most frequently injured sites. Insurgence was responsible for most of the attacks and injuries resulted mainly from high caliber fire arms. Addressing poverty and unemployment among youths are desirable mitigating measures.

Key wards: Gunshot injuries, fire arms, Unknown gunmen, insurgents.

INTRODUCTION

Fire arms are the most destructive of the readily available weapons in modern society. The incidence of civilian gunshot injuries (GSI) and their consequent devastating fatalities has been on the increase in the last two decades worldwide (Persad et al., 2005; Mohammed et al., 2005) but African continent especially sub-Saharan Africa seems to be the most conflict- afflicted region (Uba et al.,2003).
Notable causes of gunshot injuries in Nigeria like many African and developing world include communal clashes, sectarian religious crises, armed robbery and political violence (Ogunlusi et al., 2006). The upsurge in crimes are being blamed on poverty, dwindling economic fortunes of the majority and lack of good governance in most developing countries (Mohammed et al., 2005, Onuminya et al., 2005, Umaru et al., 2006).

Even more worrisome are the indications that youth of the productive age groups are often the major perpetrators and victims of these violent crimes resulting in both human and economic loss at both family and societal levels (Mohammed et al., 2005)

The study was undertaken to evaluate the current pattern and presentation of GSI in our environment with the aim of highlighting the magnitude of the problem and

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Abbreviation: Gunshot injury **(GSI)**

Table 1: Age and sex distribution of patients with gunshot injuries

Age	Sex		Total (%)
	Male	Female	
0-10	3	1	4(3.3)
11-20	13	2	15(12.4)
21-30	36	3	39(32.2)
31-40	26	3	29(24.0)
41-50	19	0	19(15.7)
51-60	8	1	9(7.4)
>60 Total	4	2	2(1.7)
	109	12	121(100)

Table 2: Cause of gunshot injury and type of gun used

Cause of GSI	Type of gun used				
	Rifle/AK47	Pistol	Den-gun	Unidentified	Total (%)
Unknown gun men	68	2	2	9	81(66.9)
Armed robbers					
Security agents	8	1	-	5	14(11.6)
Stray bullets					
Accidental discharge	9	-	-	-	9(7.4)
Total					
	11	-	-	4	15(12.5)
	2	-	-	-	2(1.6)
	98	3	2	18	121(100)

urge the relevant authorities to take proactive measures of curbing the menace.

PATIENTS AND METHODS

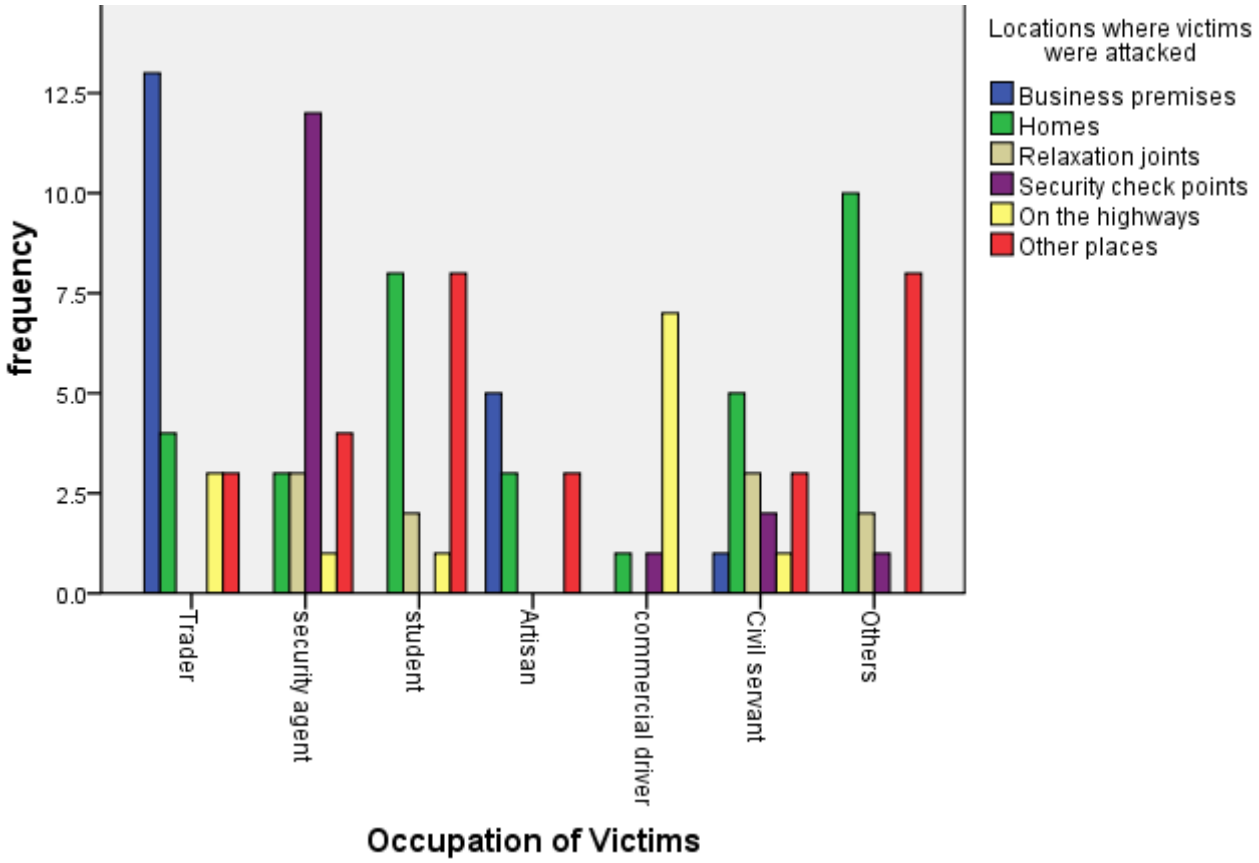
The study design was a prospective survey of gunshot injuries that were admitted and managed at the University of Maiduguri teaching hospital between March 2011 and April 2012. The hospital is level II facility located in Maiduguri the capital city of Borno State in Northeastern Nigeria. The hospital mainly serves the over four million population of Borno state and also takes care of referrals from the rest of the five states that constitute the Northeast sub region. Data collected in a prepared proforma on each patient included demographic data, causes of GSI, locations where GSI victims were attacked, type of guns used, site of injuries, treatment given and outcome of management. Data obtained was analysed using SPSS version 16.0 and presented in simple tables and graph.

RESULTS

There were 121 patients seen with gunshot injuries out of the 31,481 accidents and emergency admissions within the 12 months period of study, accounting for 0.4% of all emergency admissions. Males were 109(90%) and only 12(10%) were females, with male: female ratio of 9:1. The median age was 32 years and the upper and lower limits were 80 and 9 years respectively with a mean of 34.5 ±14.3. The age and sex distribution of GSI is shown in table 1.

Table 2 shows the cause of gunshot injury and the types of gun used.

Figure 1: Occupation and location of ginshot injury victims



Most of the gunshot injuries were inflicted by unknown gun men (insurgents) and Rifle/AK47 was the most frequently used type of gun.

The occupation of GSI victims and locations where attacks were carried out is as shown in Figure 1; most of the victims were traders and security agents who were attacked in their business premises.

The distribution of sites of injuries was as follows, GSI affected the extremities in 81(66.9%) patients, out of these 57(70.4%) involved the lower limbs and 24 (29.6%) upper limbs. Other sites of injuries were abdomen in 24(19.8%) patients, trunk in 7(5.8%) and chest in 6(5.0%) victims; while 3 (1.5%) patients had injuries to the head and neck.

Open fractures in these injuries were as follows femur 32(26.4%), tibia and fibula 15(12.4%), fibula alone 3(2.5%) and humerus 15(12.4); others were radius and ulnar 5(4.1%), metatarsal bones 3 (2.5%) and metacarpal bones 2(1.7%).

The first aid treatment included broad spectrum antibiotics, tetanus prophylaxis, and analgesics, while the definitive management of the patients included wound debridement and appropriate wound care, 36(29.8%) had manipulation of fracture under anaesthesia and application of plaster of Paris cast (POP), 30(24.8%) had skeletal traction, 6(5.0%) had external fixation and open reduction and internal fixation in 3 (2.5%) patients. Other procedures included exploratory laparatomy and appropriate surgery 21(17.5%), thoracostomy in 5(4.1%) and limb amputation in 7(5.8%) patients; while 13(10.7%) patient had only wound debridement and dressing.

Fourteen patients (11.6%) developed wound infections, 4 (3.3%) patients had paralysis and 6(5%) had joint stiffness. There was nonunion in 3(2.5%) while 9(7.4%) patients died on admission; one each due to head and chest injuries, the rest were due to abdominal visceral injuries.

DISCUSSION

Gunshot injuries are major problems worldwide from the human, medical and economic angles (Rainio et al., 2005; Ogunlusi et al., 2006).

In this study there were 121 patients seen within 12months, this far outnumber the total of 70 patients

seen in four year study conducted in the same centre six years earlier (Umaru et al., 2006). This may actually be an underestimate of the magnitude of the current problem in our environment, since this a hospital based statistics; there are many uncomplicated cases managed at privates and level I hospitals within the same period. Furthermore as reported by mohammed et al., (2005) persons who died at the scene of shooting are frequently hastily buried by relations in keeping with religious customs. The predominance of males was in keeping with increased susceptibility of males to trauma in general compared to the female counter part, as demonstrated by other researchers (Aderounmu et al., 2003; Onuminya et al., 2005; Ogunlusi et al., 2006). The male youths in particular are more often involved in interpersonal violence and are known to be principal perpetrators of civil conflicts and armed robbery as documented locally (Mohammed et al., 2005) and other parts of Africa (Saidi et al., 2002).

Eighty seven (72.0%) of the victims were below the age of 40years (Table 1), the results demonstrated that the burden of fire arm violence is borne to a considerable extent by young adults; which could imply premature loss of productive work force at both family level and nationally as noted by other researchers (Ogunlusi et al., 2006).

Unlike earlier studies from most Nigerian cities where armed robbery attacks were responsible for the greatest proportion of gunshot injuries and fatalities (Adesanya et al., 1998; Okobia et al 2001, Mohammed et al., 2005; Umaru et al., 2006; Ogunlusi et al., 2006), gunshot injuries from unknown gunmen (insurgents) linked with religious extremist were responsible for most (Table 2) gunshot injuries and fatalities in the current survey. While previous reports from the same centre showed that armed robbery was responsible for more than 80% of gunshot injuries (Umaru et al., 2006), the current study indicated that armed robbery accounted for only 11.7% of gunshot injuries. This might suggest that armed insurgents have overtaken other forms of violence in our environment.

Similarly the current study revealed an upsurge of GSI attributed to legal intervention by security agents; compared to other reports (Okobia et al., 2001; Ogunlusi et al., 2006) this might not be unconnected with ever increase presence of law enforcement agents on the streets of the cities to quell insurgents and maintain law and order. An equally disturbing observation was the occurrence of stray bullets injuries, which injure innocent bystanders. Mohammed et al. (2005) in their findings reported stray bullet injuries to innocent by standers during arrest of criminals by security agents. In the current study most of the stray bullet injuries occurred during exchange of fire between security agents and insurgent militants and there were incidences of gunshot injury sustained in bedroom from stray bullets.

The guns used by the unknown gunmen in this study were high caliber fire arms; Rifle/ AK 47 were the most frequently used weapon and a few locally made den guns. This does not agree with studies from other cities in Nigeria (Adesanya et al., 1998, Okobia et al 2001, Mohammed et al., 2005, Ogunlusi et al 2006) where majority of the firearms used in civilian incidences were low velocity handguns and locally made den guns. The survey also differs with findings from United State where handguns were used in 75% and riffle in only 4 % of the 10, 000 homicides committed in 2005 ("Expanded Homicide Data Table 7. 2001-2005). The increased civilian violence with the perpetrators operating with high caliber weapons might require more commitment by Government at all levels, in monitoring the proliferation and movement firearms across states and the country's borders to curb illegal possession.

Previous reports (Mohammed et al., 2005; Umaru et al., 2006) indicting poverty and unemployment as underlying factors to armed violence in Nigerian cities, underscores the current findings which revealed that most of the victims of GSI were traders who were attacked at their business premises (Figure 1) and their valuable often carted way by the insurgents; while the security agents were often wounded during open confrontation when enforcing law and order or ambushed by the insurgents while on patrol.

The most frequently injured sites were found to be the extremities in which majority were lower limbs, this agrees with previous studies (Aderounmu et al., 2003, Mohammed et al., 2005, Ogunlusi et al., 2006) and report of increase extremities GSI in United Kingdom (Persad et al., 2005), although their study concentrated on GSI to the extremities only. The increase number of patients seen with extremity injuries in this survey also agrees with Owen-Smith's report of increased survival of patients with peripheral vessel GSI, compared to patients with injury to the major vessels of the abdomen or thoracic cavities few of whom survive to reach the hospital (Owen-Smith, 1981).

As reported by others (Owen-smith1986, Uba et al., 2003) definitive management of GSI and war- wounds entails staged procedures, wound management were staged in this study, with resuscitation and arrest of haemorrhage; tetanus toxoid and antibiotics prophylaxis. The definitive wound care was carried out by initial excision of grossly contaminated, dead, and damaged tissue leaving area of healthy tissue with good blood supply capable of combating residual infection, followed by delayed primarily closure. The long bone fractures were managed based on the available facilities, mainly with external fixators, skeletal traction and plaster plaster of paris cast with access window for wound care, this in contrast to the practice of early internal fixation with locked intramedullary nails as practiced in other centres (Hennessy et al., 1976, Donald et al., 1995,

William et al 1995) which reduces period of hospitalization and improved outcome of treatment. This was not achievable in this study as there were no facilities for such. Furthermore Yinusa et al. (2000) in their own experience of fracture management from GSI in Lagos, Nigeria advised that for our present state of development gunshot fractures should not be primarily treated with internal fixation. Wound infection was the commonest complications noted, as documented elsewhere this is not surprising because wounds cause by weapons of war are potentially contaminated (Drriscoll, 1999; Uba et al., 2003) In addition wound management in mass casualty situation is likely to be delayed or inadequate, the insurgence in Maiduguri and parts of the Northeast often produced mass casualties that some times necessitated the services of surgeons and trainees alike a situation that could lead to breach in the protocol of war wound management; Similar experience was reported by Uba et al.(2003) in Jos North-central, Nigeria.

Among the disabling consequences of non fatal GSI in our patients were paralysis due to spinal cord gunshot injuries and limb amputations due to severe injuries.This agrees with similar report in Soweto, South Africa and some Nigerian cities, (Cock, 1989; Mohammed et al., 2005)

Our mortality of 7.4%, most of which were due to abdominal visceral injuries concurs with report of 13.5% mortality from Ile-Ife, Nigeria (Ogunlusi et al., 2006) and a similar experience in Recife, Brazil where abdominal and chest GSI were responsible for majority of the mortalities (Falbo et al., 2001)

The study revealed that gunshot injuries occurred more in males below the age of forty years, the limbs were more frequently injured, most of the attacks were attributed to armed insurgents and injuries resulted mainly from Rifles/ AK-47 fire arms. Addressing the root causes of violence such as corruption and lack of good governance; poverty, unemployment and religious extremism are important measures of curbing the current security threats in Nigeria and parts of Africa.

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