

Management Of Gunshot Injuries Due To Insurgency In The North-Eastern Nigeria

A S Abubakar, A A Bakari, Y M Saad, U M Tela, Y B Ngamdu, B U Deba

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Abstract

Background and Objectives: Violent Trauma especially gunshot injuries has alarmingly increased worldwide. With the advent of insurgency to date in Nigeria, fatal gunshot injuries became serious health problem. We present a review of our management of gunshot injuries due to the insurgency and proffered suggestions on how to improve on the managements of these injuries in North-eastern Nigeria.

Patients and Methods: This is a prospective study of 147 patients managed for gunshot injuries in University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria. This study was conducted during the insurgency period between January, 2011 and December, 2013. The study population included adults and paediatric age groups. The data collected was analyzed using statistical software for social sciences (SPSS) version 20. All patients were managed by the various specialties in the hospital from the time of presentations to the hospital to the time of discharge or otherwise. Patients were then followed up accordingly.

Results: One hundred and forty-seven (147) patients with gunshot injuries were being managed during the period under review. There were more males, 134 (91.2%), than females, 13 (8.8%); ($\chi^2=199.0$ $p=0.00$) with M: F of 10:1. Their ages ranged from 5 – 72 years with the mean age of 38.6 years ($SD\pm 18.3$). During the insurgency conflict, high velocity rifles with long gun were frequently used on 145 (98.6%) patients while short guns were used on the remaining 2 (1.36%) patients. Majority of the patients, 132 (89.8%) sustained multiple sites of gunshot injuries, followed by head and neck injuries occurring in 92 (62.6%) subjects. The least site of injuries was pelvic and perineum. Only 9 (6.1%) patients had first aid intervention at the scene of the gunshots. Majority of the patients, 67 (45.6%), were rescued and transported to the hospital by the security operatives. The definitive treatments involved multi – disciplinary subspecialties.

Conclusion: Insurgency in the north-eastern part of Nigeria had become a burden with high morbidity and mortality. There is need to update the skills of the surgeons on the management of insurgency, combat casualties and to open well equipped trauma centre with functional standard ambulance services in this sub-region.

INTRODUCTION

Gunshot injuries are high velocity missile injuries which can cause profound morbidity and significant mortality due to wound severity from high energy impact, inadequate first aid at the time of injury, long evacuation time from the site of injury and faulty surgical technique.^{1, 2, 3} These injuries result from bullets of high velocity military rifles, pistols and hand guns which can occur in both military and civilian settings and usually involve more than one person. These injuries usually demand urgent surgical attention and antibiotic treatment. The causes of gunshot injuries in Nigeria like many other African

countries and developing countries may include sectarian religious crises, military violence, communal clashes, armed robbery, political violence, students' cultism and of recent the high incidence of insurgency in Nigeria in general and North-Eastern Nigeria in particular.^{3,4,5,6,7} Gunshot injuries were first reported in West Africa following the Nigerian civil war of 1967-1970.⁶ In Transkei region of South Africa it was the commonest cause of death.⁷

Gunshot injuries could be devastating especially when it involves vital organs and could result to instant death. The

cost of treating patients that survive these injuries could be enormous especially when the injuries are to the head, chest, abdomen and the spine.^{8, 9, 10} According to the Oxford English Dictionary insurgency is defined as armed rebellion against a constituted authority (an authority recognized as such by the United Nations) when those taking part in the rebellion are not recognized as belligerents. We therefore reviewed our management of gunshot injuries due to the insurgency in the North-eastern Nigeria in order to proffer suggestions on the way to improve the managements. .

Patients and Methods:

This is a prospective study of gunshot injuries that presented to the University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria from January, 2011-December, 2013. The following details were appropriately entered into a preformedpreform: age, gender, occupation, presenting complaints, , gun type, site of injury, number of shots, first aid at the scene of attack, transportation used, patients rescuers, duration from the time of attack to presentations, type of resuscitations, outcome of resuscitations, diagnosis,types of surgical intervention, duration of hospital stay, psychotherapy, rehabilitation, outcome of treatment and complications associated with the injuries. All patients were monitored from the time of presentation to the hospital till when they are discharged or otherwise. Ethical clearance was obtained from the research and ethical committee of the hospital. Data was recorded and analyzed using SPSS version 11.0 (Statistical Package for Social Sciences) Inc. Standard, 2001. The results were presented as frequency, percentages and chi squares. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

Socio-Demographic Characteristics

One hundred and forty-seven(147) patients with gunshot injuries were being managed during the period under review. Their ages ranged from 5 – 72 years with the mean age of 38.6 years (SD \pm 18.3). Most of the injuries occurred among the age group 18-35 years (p= 0.00). There was more males 134 (91.2%), than females 13 (8.8%); ($\chi^2=199.0$ p=0.00) with M: F of 10:1. Majority of the gunshot injuries occurred among the business men and women occurring in 82 (55.8%) while the least injuries occurred among the civil servant; 5 (3.4%). Table 1 showed the socio-demographic characteristics of the study population.

Table 1

Socio-demographic characteristics of the study population

| Age (years) | frequency | Per cent | p-value |
|-------------------|-----------|----------|---------|
| 0-17 | 29 | 19.73 | |
| 18-35 | 91 | 61.91 | 0.00 |
| 36-80 | 27 | 18.37 | |
| Sex | | | |
| Male | 134 | 91.16 | |
| Female | 13 | 8.84 | 0.00 |
| Occupation | | | |
| Business people | 82 | 55.75 | |
| Students | 24 | 16.33 | 0.57 |
| Security | 20 | 13.61 | 0.00 |
| Unemployed | 16 | 10.88 | 0.00 |
| Civil servants | 5 | 3.40 | 0.00 |
| Total | 147 | 100.00 | |

Majority of the patients, 112(76.2%), had single bullets injuries while 35(23.8%) had multiple bullets injuries; ($\chi^2=80.7$, p=0.00). Majority of the patients,132 (89.8%) sustained multiple sites of gunshot injuries, followed by head and neck injuries occurring in 92 (62.6%) subjects. Eighty-seven (59.2%) subjects sustained chest injuries while abdominal injuries occurred in 79 (53.7%) subjects. The occurrence of the gunshot injuries in the different sites was not different; ($\chi^2=148$, df=5, p=0.00. Table 2 showed the various sites of injuries sustained by the victims of the insurgencies.

Table 2

Various sites of injuries sustained by the victims of the insurgencies

| Site of injury | Frequency | Per cent | p-value |
|---------------------|-----------|----------|---------|
| Multiple sites | 132 | 29.73 | |
| Head and neck | 92 | 20.72 | 0.002 |
| Chest | 87 | 19.59 | 0.00 |
| Abdomen | 79 | 17.79 | 0.00 |
| Limbs | 47 | 10.59 | 0.00 |
| Pelvic and perineum | 7 | 1.58 | 0.00 |
| Total | 444 | 100.00 | |

($\chi^2=148$, df=5, p=0.00)

One hundred and six (72.1%) of these patients were transported by Taxi or personal public vehicles. Majority of the patients were rescued and transported to the hospital by the security operatives which made of 67 (45.6%) patients followed by relatives and sympathizers of 60 (40.8%) and 20 (13.6%) patients respectively. Majority of the patients

87(59.2%) arrived the hospital's Accident and Emergency department within one hour of incidence. Only one patient had ambulance service as shown in Table 3. Only 9(6.1%) patients had first aid intervention at the scene of the gunshot injuries, whereas majority 138(93.9%) patients had no first aid intervention. The patients received first aid treatment, including intravenous fluids, broad spectrum antibiotics, tetanus prophylaxis, debridement of the wound and analgesics. The definitive treatment ranges from laparotomy, amputations to thoracotomy depending on the diagnosis made.

Table 3

Shows the means of transportation of the patients from scene to the hospital

| Means of transportation | Frequency | Per cent |
|-------------------------|-----------|----------|
| Public vehicle | 106 | 72.1 |
| JTF | 38 | 25.9 |
| Foot | 2 | 1.4 |
| Ambulance | 1 | 0.7 |
| Total | 147 | 100.0 |

Sixty – eight (41.3%) of the patients had blood transfusion because of massive blood loss and 26.5% of them had the transfusion within 6 hours of arrival to the hospital; Table III.

Table 4

shows the time of first blood transfusion following gunshot

| Duration (hour) | frequency | percentages |
|-----------------|-----------|-------------|
| 1-6 | 39 | 26.5 |
| 7-13 | 14 | 9.5 |
| 14-20 | 08 | 5.4 |
| >20 | 06 | 4.1 |

Seventy nine (53.7%) patients had no transfusion

Most patients,74 (50.3%), were managed at the Male Surgical ward while only 13 (8.8%) patients were managed at Female surgical wards. There were 39 (26.5%) deaths and 108 (73.5%) survived the injuries and the differences were significant ($\chi^2= 64.8, df=1, p=0.000$).

Table 5

Shows the wards were patients are managed and the outcomes

| Wards | n (%) | Survived (%) | Death (%) |
|-------------|-----------|--------------|-----------|
| MSW | 74 (50.3) | 56 (75.7) | 18 (24.3) |
| Orthopaedic | 23 (15.6) | 18(78.3) | 5 (21.7) |
| HDU | 22 (15.0) | 18(78.3) | 5 (21.7) |
| ICU | 15 (10.2) | 10 (66.7) | 5 (33.3) |
| FSW | 13 (8.8) | 9 (69.3) | 4 (30.7) |
| Total | 147 (100) | 108 (73.5) | 39 (26.5) |

Key: MSW- Male surgical ward, FSW- Female surgical ward, HDU- High dependency ward, ICU- Intensive care unit.

Most of the patients, 38 (25.8%), were admitted for 6-10 days. The least duration of admission was <1 hour occurring in only 1 (0.7%) patient while the longest duration of admission was >30 days involving 32 (21.8%) patients; Table 6.

Table 6

Shows the duration of hospital stay

| Duration (days) | frequency(patients) | percentages |
|-----------------|---------------------|-------------|
| < 1 | 01 | 0.7 |
| 1-5 | 11 | 7.5 |
| 6-10 | 38 | 25.8 |
| 11-15 | 10 | 6.8 |
| 16-20 | 11 | 7.5 |
| 21-25 | 27 | 18.3 |
| 26-30 | 17 | 11.6 |
| >30 | 32 | 21.8 |
| Total | 147 | 100 |

DISCUSSION

Gunshot injuries are major problems worldwide from human, medical and economic perspective 11.In this study the total of 147 patients were resuscitated and managed in our hospital with Male: Female of 10: 1 ($p=0.000$) which shows that Males are predominantly injured during insurgency like any other trauma which concur with other researches.2, 3

Most of the patients that are involved in the insurgency attacks were business personnel made of 82 (55.75%) followed by the unemployed people 16 (10.88%) and about 13.61% were security personnel. Majority of the patients were below 40 years of age as shown in table 1, which could imply an enormous premature lost of productive times and lives in a productive work force, this was similar to the findings of Ogunlusi et al.12

It was also observed that majority of the patients had single bullets injuries this may not be unconnected to the intensive

training of these insurgents and the type of modern guns used for these attacks. This contradicts the findings of Ogunlusi et al 12 they found that locally made guns are mostly used in their research. Bullets from high velocity rifles cause tissue destruction, temporary cavitations and send spherical shock waves to adjacent structures as it traverses through the tissues. The spherical shock wave cause damage especially to solid tissues like liver and spleen, and fluid filled tubes like arteries and veins.¹³

The most frequent injured site was found to be the head and neck in 92 (62.9%) patients followed by abdomen in 87 (59.2%) patients this may implies that the insurgents are aiming to the vital organs which may lead to death as shown in table 2. This was in disagreement to the earlier researches 13, 14 which shows that upper limbs were more involved during gunshots. The military sustaining limb extremity injuries probably were protected from body fatal gunshots by the protective body armour they were putting on. Most of the patients under review had more than one injury sites as shown in Fig 1a and some involved the neck as showed in Fig 1b.

We observed that most of the patients were transported to the hospital by the security personnel which revealed that immediately after the attack people are afraid to go to the scene of the attack but only the security operatives and majority of this operatives had no knowledge of resuscitation and the safest means of transportation of injured patients to the hospital. However, majority of the patients (59.2%) arrived in our Accident and Emergency unit within one hour of the incidence.

The patients were evaluated and sorted out for various medico-surgical interventions. The patients under study required surgical attention hence given priority in the management. Majority of patients with truncal haemorrhage received blood transfusion. An average of 3 pints of blood was transfused and about 26.6% of transfusions were done within 6 hours of arrival. The blood bags were obtained from National Blood Transfusion Service (NBTS) unit within the hospital. The presence of NBTS unit has greatly saved these patients from hypovolaemic shock and death.

Basic resuscitation were instituted which included oxygen therapy and fluid management. When patients' condition stabilized radiological imaging was done according to the region of the body involved. All wounds grossly contaminated, dead and damaged tissues were thoroughly excised and depth extremity wounds were laid open (Fig.

1c). All wounds were gently and copiously irrigated with normal saline and hydrogen peroxide where necessary and safe to use.

About 93% of the patients had parenteral antibiotics, predominantly ciprofloxacin and metronidazole. This is similar to the earlier reserches.^{15,16} Intramuscular injection of Tetanus Toxoid as prophylaxis was also included. Early surgical interventions were planned according to subspecialty involved. Out of 79 patients with abdominal gunshot in injuries, 34 patients had laparotomy with colonic resections; the rest had other regional injuries. Four patients had laparotomy and thoracotomy. Two patients had ocular injuries of which one had corneal repair and the other, the eyeball was enucleated. Those with facial and long bones fractures were managed by maxillofacial and orthopaedic surgeons respectively.

Two patients sustained urinary bladder and penile injuries with pelvic fracture and had repairs by urologist. Four patients had femoral vessels injuries which were repaired by a vascular surgeon. Because of immense fear and confusion associated with insurgency conflict about 10% of these patients had psychiatric evaluation and management. The average hospital stay was 3 to 12 weeks. We also observed that there was poor or absence ambulance services despite the state of emergency in the zone since the commencement of the insurgency. The mortality rate due to gunshot following insurgency was 26.5% this exclude those that had instant death or brought in death.

We therefore, wish to recommend that the earlier the insurgency in the North-eastern Nigeria is handled, the better it will be, so as to safeguard the precious lives of young adults that are mostly affected by the insurgency. There is need to improve in the management by constant provision of emergency resuscitative consumables and equipments, and building of trauma centre with standard adequate ambulance services, which is lacking in this region. It is also important to develop special training for both military and civilian medical personnel on both current asymmetrical and modern combat casualty care. The security operatives need to be trained on basic resuscitative techniques and the need for further staff training and re-training on the management of mass casualties and gunshot injuries in our centre.

Figure 1 a, b, c

(a) shows gunshot wound of the abdomen in one of the patients. (b) Shows a cavity created by pallet. (c) Extent of gunshot injury involving the posterior a surface of the right forearm



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Author Information

Adamu Sadiq Abubakar

Department of Anaesthesia and Intensive Care, University of Maiduguri Teaching Hospital
Maiduguri, Borno State, Nigeria
drsadiq20032003@yahoo.com

Abubakar Alhaji Bakari

Department of Surgery, University of Maiduguri Teaching Hospital
Maiduguri, Borno State, Nigeria

Yauba Mohammad Saad

Department of Paediatrics, University of Maiduguri Teaching Hospital
Maiduguri, Borno State, Nigeria

Usman M. Tela

Department of Surgery, University of Maiduguri Teaching Hospital
Maiduguri, Borno State, Nigeria

Yusuf Bukar Ngamdu

Department of Ear, Nose and Throat, University of Maiduguri Teaching Hospital
Maiduguri, Borno State, Nigeria

Babayo Usman Deba

Department of Surgery, University of Maiduguri Teaching Hospital
Maiduguri, Borno State, Nigeria