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Gunshot injuries in Maiduguri north eastern Nigeria

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Abstract

Background: Gunshot injuries are a global problem especially in the developing world where poverty, political instability, easy access to firearms, and terrorism are common.

Patients and Methods: We reviewed all gunshot injury patients managed at specialist hospital Maiduguri over two- years. The patients were managed by trauma team.

Results: A total of 338 patients were studied age ranged from 3 months to 76years, peak age group 30–39 years accounting for 29% with male to female ratio of 4.83:1. Pattern of injuries were lower extremities in 51.78%, and abdomen in 11.83%. Procedures performed were exploratory laparotomy in 92.50% of abdominal injuries, thoracostomy tube drainage in 89.29% of chest trauma. The post-operative complications were limb shortening in 14.50%, and surgical site infection in 11.54%. Mortality was 8.58%. Prognostic factors were site of injury, multiplicity, co morbid conditions, shock, and renal failure among others.

Conclusion: Good governance, poverty alleviation, education, and gun control policy by respective governments are essential in reducing the menace of gunshot.

Keywords: Gunshot injuries, Pattern, Management outcome, prognosis, developing country.

1. Introduction

Gunshot in injuries were first reported in West Africa following Nigerian civil war in 1967 – 1970, recently the incidence has been on increase worldwide [1, 2]. There is a growing concern over indiscriminate use of firearms on large scale and use of small arms and light weapons (SALW), has been described as a cancer spreading across the developing world [3, 4]. Conflicts in the horn of Africa, the rise of Al-Shabab in Somalia and Sudan, the fall of Gaddafi in Libya, and Saddam Hussein in Iraq, all contributed greatly in the proliferation of small arms and the rise of war lords in the Middle East, North Africa and Sub – Saharan Africa. The ideological conflicts fueled by poverty, ignorance and bad governance led to the birth of ISIS, JAES, and Boko Haram in Syria, Yemen, and Nigeria respectively. In the theatre of war between respective governments and these Terrorists more often than not civilian populations fall victims. When such terrorist organizations run out of essential supplies, the resort to highway armed robbery, market raids, and bank robberies all of which the civilian population bear the brunt. North Eastern Nigeria has been under state of emergency since 2010 due to Boko Haram insurgency with over 20,000 civilians dead, many permanently disabled physically and mentally, with over 3 million internally displaced. The management of such patients require a multidisciplinary approach. Prompt and adequate resuscitation sometimes side by side with definitive treatment are essential to ensure positive outcome 5, 6. This study aimed at reviewing gunshot injuries, pattern, outcome of management and possible prognostic indicators.

2. Patients and Methods

The study retrospectively reviewed all gunshot injury patients managed at the state specialist hospital Maiduguri over a two- year period between January 2014 and December 2015. The permission for the was obtained from the Hospital management. Informed consent was obtained from all patients. Information was extracted from patients' clinical notes, laboratory, and theatre records. Data analyzed using spss version 16. All patients were resuscitated with intravenous fluids, parenteral antibiotics (metronidazole and ceftriaxone), tetanus toxoid, and blood transfusion where indicated. Investigations done were full blood count, blood chemistry, urinalysis fasting blood sugar, plain radiographs, ultrasound scan, and CT scan where necessary.

The patients were managed by a multi-disciplinary trauma team. All patients had surgery under anesthesia (regional or general). Procedures done were debridement, external fixation of fractures, chest tube drainage, laparotomy (organ repairs, bowel resections, splenectomy, Nephrectomy among others}, Limb amputations, with some patients having multiple procedures. Rehabilitative measures were offered in form of physiotherapy, psychotherapy, and limb prostheses.

3. Results

A total of 338 patients were studied age ranged from 3 months to 76years, and peak age group 30 – 39 years accounting for 98(29%) table 1 with male to female ratio of 4.83:1. The pattern of injuries were upper and lower extremities in 134(39.65%), and 175(51.78%), and abdomen in 40(11.83%). Four patients presented with traumatic amputation of left arm in 2(0.59%), 1(0.3%), and 1(0.3%) right index finger. Fractures of left humerus, radius/ulna, and hand in 19(5.62%), 12(3.55%), and 2(0.59%) respectively. Right upper limb fractures were humerus, radius/ulna, and hand in 16(4.73%), 8(2.37%), and 5(1.48%). Soft tissue injuries of the upper extremities were 38(11.24%) and 34(10.06%) on the right and left respectively. Lower limb fractures were pelvis in 6(1.78%), right femur in 15(4.44%), tibia/fibular in 17(5.03%), and foot in 3(0.89%). Left femoral fracture seen in 27(7.99%), tibia/fibular in 25(7.4%), and foot in 3(0.89%), while soft tissue injuries seen in lower extremities were 42(12.43%) on the right and 37(10.95%) on the left. Seven (2.07%) patients had spinal injuries. Abdominal injuries were mesenteric in 29(8.58%), large and small bowel in 14(4.14%), bladder in 9(2.66%), stomach in 7(2.07%), liver in 5(1.48%), spleen and kidney 3(0.89%) each. Others were urethral disruption injuries, and scrotal involvement in 6(1.78%), and 4(1.18%) respectively. Chest involvement were flail chest in 3(0.89%), hemopneumothorax in 17(5.03%), suck – in chest in 2(0.59%), lungs and mediastinum in 6(1.78%). Head and neck injuries were severe maxillofacial in 5(1.48%), skull and brain in 7(2.07%), and soft tissue of the neck in 11(3.25%). The co- morbid medical conditions were hypertension in 33(9.76%), diabetes mellitus in 17(5.03%), sickle cell disease in 7(2.07%), and asthma in 5(1.48%). The procedures done were serial wound debridement in all patients (100%), exploratory laparotomy in 37(92.50%) table 2. The post-operative complications were limb shortening in 49(14.50%), and surgical site infection in 39(11.54%) table 3. Twenty-nine (8.58%) patients died. Causes of death were sepsis in 9(2.66%), kidney failure in 5(1.48%), while hemorrhage, tetanus, deep vein thrombosis/ pulmonary embolism, and diabetic ketoacidosis accounted for 3(0.89%) death each. Other causes of death were meningitis, and disseminated intravascular coagulation in 2(0.59%) each while 1(0.30%) died of cerebrovascular accident. Out of the 29 patients that died 5 had primary brain injury, 4 had mediastinal injury, 3 severe maxillofacial injuries. Multiple injuries were found in 19 patients.

4. Discussion

Gunshot injuries cut across all age groups with predominance in the economically productive age groups. The current study found peak age group 30 – 39 years accounting for 29%, with 80.84% below the age of 50 years. Similar trends were found in Enugu and Lagos [7, 8]. The commonest sites affected were the extremities, abdomen, chest and head and neck. These findings were in variance to

what was obtained in Pakistan where head and neck was the commonest site. Reasons for the attack were arm robbery in previous study from Maiduguri[10], gang related violence in US [11]. However the current study found terrorism by the Boko Haram fundamentalists as the sole reason for attack. Late arrival of victims to the Hospital is common findings in developing countries where information communication and transport systems are poor [12] these study found the same as most attack occurred at night and until day broke before help arrived even at that the pre hospital emergency medical services were lacking as is found in most part of developing countries [13]. The importance of pre hospital trauma care system has been emphasized by world health organization [14, 15]. Adequate pre hospital care would have prevented complications at presentation such as hemorrhage, shock, sepsis and renal failure at presentation, thereby improving outcome.

5. Conclusion

Firearms injuries are fairly common and are on the increase especially in developing countries. Good governance, poverty alleviation, education, and gun control policy by respective governments are essential in reducing the menace. Effort should be made to address the root causes of terrorism globally.

Table 1: Age distribution

Age(yrs)	No	%
<10	20	5.92
10 -19	49	14.50
20 -29	67	19.82
30 -39	98	29.00
40 -49	38	11.24
50 -59	29	8.58
60 -69	27	7.99
70 -79	10	2.96
Total	338	100

Table 2: Procedures performed

Procedure performed	No	%
Wound debridement	338	100.00
Plaster of Paris/Traction	246	79.61
Open reduction and internal fixation	63	20.39
Laparotomy	37	92.50
Thoracostomy tube drainage	25	89.29
Tracheostomy	5	21.74

Table 3: Post-operative complications

Post-operative complications	N	%
Limb shortening	49	14.50
Surgical site infection	39	11.54
Clinical depression	21	6.21
Osteomyelitis	13	3.85
Deep vein thrombosis	9	2.66
Acute renal failure	9	2.66
Residual abscess	7	2.07
Reactional hemorrhage	5	1.48
Salivary fistula	5	1.48
Acute gastric dilatation	5	1.48
Enterocutaneous fistula	3	0.89
Gas gangrene	3	0.89
Meningitis	3	0.89
Ogilvie's syndrome	2	0.59

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