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Improvised explosive devices (IED) blast injuries in Maiduguri north eastern Nigeria

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Abstract

Background: Improvised explosive device blast injury is fairly common where terrorism flourishes especially when suicide bombers are involved, leading to mass casualties.

Materials and methods: The study reviewed all victims of improvised explosive device blast injuries in Specialist Hospital Maiduguri North Eastern Nigeria between January 2014 to December 2015.

Results: A total of 323 patients were studied age ranged from 6 months to 81 years with male to female ratio of 4.38:1. The peak age group was 20 – 29 years accounting for 26.93%. Site injured were extremities in 69.66%, and abdominal in 15.48%. Procedures performed were wound debridement in all patients, and exploratory laparotomy in 34.00% of abdominal injuries. Post-operative complications were surgical site wound infection in 11.46%, and ileus in 0.93%. The mortality was 6.50%.

Conclusion: The approach to such mass causality is to have good pre hospital care, prompt and adequate resuscitation, and definitive treatment by multidisciplinary team

Keywords: Improvised explosive device, Suicide bomb, Terrorism, developing country

Introduction

Improvised Explosive Devices (IEDs) have a devastating impact on the lives of civilians around the World. The threat of IED attack is a global problem in recent years their impacts were most acutely felt in Iraq, Pakistan, Afghanistan, Syria and Nigeria [1]. In the hands of terrorists they kill thousands every year inflict desperate physical injuries, and spread fear and disruption across affected communities. Such attacks block life-saving humanitarian aid, close down markets, schools and hospitals, and hinder the political, social, and economic development of a country [2]. IEDs are responsible for 63% and 66% of coalition forces deaths in Iraq, and Afghanistan [3, 4]. IEDs may incorporate military or commercially sourced explosives or made from homemade explosives. They are either timer- operated, victim operated, or command operated. When deployed by terrorist on civilian population especially by suicide bombers as is currently seen where teenage girls were indoctrinated by Boko Haram ideologists, the result is mass causality. Injury may be Primary (due to blast wave), Secondary (from secondary missiles), Tertiary (victims thrown against walls, vehicles etc), or Quaternary (inhalation of toxic chemicals, burns, drowning etc). More often than not many fatalities are recorded at the scene of the blast. In the event of twin or triple blasts in series fatalities are much higher as rescue workers fall victims of subsequent blasts. Survivors are usually multiply injured [5] therefore the need for pre hospital care system [6], and hospital based multidisciplinary trauma team management [7]. The study aimed at reviewing IEDs blast injuries in Maiduguri, and outcome of management.

Patients and Methods

The study reviewed all victims of improvised explosive devices blast injuries in Specialist Hospital Maiduguri Borno State North Eastern Nigeria between January 2014 to December 2015. Permission for the study was obtained from the Hospital management and informed consent was obtained from all patients. Information extracted from clinical and laboratory records and data analyzed using SPSS statistical analysis. Patients were managed by multidisciplinary trauma team. All patients were resuscitated using intravenous fluids, antibiotics (ceftriaxone/ metronidazole), tetanus toxoid, and blood where necessary. Investigations done were full blood count, blood chemistry, fasting blood sugar radiographs, abdominal ultrasound scan, intravenous urography, and CT/ MRI where necessary. All procedures were done under regional or general anesthesia.

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Results

A total of 323 patients were studied age ranged from 6 months to 81 years with male to female ratio of 4.38:1. The peak age group was 20 – 29 years accounting for 87(26.93%) and 299(92.56%) of patients below the age of 50 years table 1. Site injured were extremities, upper limbs soft tissue injuries in 78(24.15%), and 14(4.33%) fractures while lower limbs had 147(45.51%) and 76(23.53%) respectively. Of note was combat vehicle blast injuries with identical fractures involving the lower limbs showing femoral, tibia/fibular, and feet in 3, 28, and 7 on either side. Others were abdominal in 50(15.48%), chest in 47(14.55%), head and neck in 24(7.43%), external genitalia in 11(3.41%). Burns, inhalational injuries, deafness, and blindness were seen in 109(33.75%), 15(4.64%), 9(2.79%), 3(0.93%) respectively, clinical depression in 37(11.46%). Vascular (radial/femoral vessels) injury in 3(0.93%), traumatic amputations (2 upper limbs and 4 lower limbs) in 6(1.86%). Procedures performed were wound debridement in all patients (100.00%), limb stump refashioning 6(1.86%), fixation of fractures in 147(45.46%), exploratory laparotomy in 17(34.00%) of abdominal injuries where mesenteric tear in 9, small bowel injury in 3, colon in 5, bladder in 4 liver in 1 and stomach in 1 were repaired, and 2 splenectomy were done. Thoracostomy tube drainage in 11(3.41%). Post operative complications were surgical site wound infection in 37(11.46%), ileus in 3(0.93%), acute gastric dilatation in 2(0.62), deep vein thrombosis in 3(0.93%), atelectasis in 3(0.93%). The mortality was 21(6.50%)

Discussion

Improvised explosive devices in now becoming common weapons of mass destructions in the hands of terrorists, more so with the new trend of suicide bombers as carriers of such weapons. The results are devastating especially among the economically productive age groups though children and elderly fall victims. The current study found 92.56% of victims below the age of 50 years and the peak age was 20 – 29 years, similar to the findings by Khan *et al* [8] with victims mean age of 30 years. Characteristically, victims in the epicenter of the blast tend to have high fatalities, and as the radius increases from the centre multiple injuries tend to be the trend with increasing chance of survival. In this study patients were multiply injured, in keeping similar study by Boffard [9]. Combat vehicle victims of improvised explosive device tend to have identical fractures [10]. This was the case in this study with identical fractures in the lower limbs. Children usually sustain head and neck injuries rather than pelvis and long bone fractures [11]. In this series most children sustained trunk, head and neck with high mortalities due to respiratory and hemodynamic instability. A common associated finding in blast injury is burns [12]. We found similar trend, with inhalational injuries complicating chronic medical conditions like asthma. Other special injuries of note were deafness due to tympanic membrane rupture as a result of blast wave, blindness as a result of noxious chemicals or shrapnel injury [13]. Traumatic amputation is a common feature of blast injury [14] especially among the dead as body parts are usually scattered at the scene of the blast. Few survivors often present with traumatic amputation of limbs as seen in this series. Long term sequelae of blast injuries like traumatic brain injury, depression, and psychosomatic disorders are well known globally [15]. We found similar trend with depression, sleep disorders, Para suicide and personality disorders. Fatality is usually high at the scene of

the blast. For survivors, pre hospital care, and multidisciplinary management tend to improved outcome. The mortality in this study was 6.50%, lower than the 10.30% by Katz *et al* [16].

Conclusion

Blast injuries due to IEDs are on the increase due to terrorism, easy access to components and prevailing political and socioeconomic conditions in the developing countries. Containment of terrorism, arms control policies, and good governance will go a long way in addressing the menace.

Table 1: Age distribution

Age (yrs)	No	%
<10	46	14.24
10-19	64	19.81
20-29	87	26.93
30-39	76	23.53
40-49	26	08.05
50-59	08	02.48
60-69	10	03.10
70-79	05	01.55
80+	01	00.31
Total	323	100

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