OCULAR INJURIES CAUSED BY IMPROVISED EXPLOSION DEVICES - CASE SERIES OF PATIENTS SEEN IN NATIONAL EYE CENTRE, KADUNA NIGERIA.

[1]Ugochukwu A Eze, [2]Murtala M Umar, [3]Olusegun B Olaniyi, [4]Ubong J Akang, [5]Ibrahim B Achi.

[1]Clinical Services Department, Katsina Eye Centre, Katsina, Nigeria
[2]Vitreoretinal Department, National Eye Centre Kaduna, Nigeria
[3]Glaucoma Cataract Department, National Eye Centre Kaduna, Nigeria
[4]Orbit and Oculoplasty Department, National Eye Centre Kaduna, Nigeria
[5]Paediatrics and Strabismus Department, National Eye Centre Kaduna, Nigeria

ABSTRACT

AIM: To highlight the pattern of ocular injuries as a result of improvised explosive devises by insurgents in Kaduna metropolis.

BACKGROUND: Ocular trauma is a cause of blindness in approximately half a million people worldwide and many more have suffered partial loss of sight. Trauma is the most important cause of unilateral loss of vision, particularly in developing countries. An improvised explosive device, also known as a roadside bomb, is a homemade bomb constructed and deployed in ways other than in conventional military action. In line with the insurgency in parts of northern Nigeria, there is need to identify the common associated ocular injuries with the view to recommending preventive measures and providing adequate resources to managing the challenges.

METHODOLOGY: Consecutive patients who presented with bomb blast associated ocular injuries and consented to the study from December 2011 through November 2012 were prospectively followed up. Demographic, clinical and operative data was entered into preformed questionnaire and analyzed with SPSS V16.

RESULTS: Seven eyes of five patients (2 bilateral) met the inclusion criteria with a mean age of 20 years (7-29 years), male to female ratio of 1.5: 1. Only one of the seven affected eyes had presenting VA of 6/60, 2 had NPL and 4 HM. Open globe injury was present in 3 eyes (1-ruptured, 2 corneal laceration) and retinal detachment in two eyes.

CONCLUSION: Bomb blast explosion is associated with catastrophic blinding ocular pathology thus the need to providing needed equipment/manpower to contain it and seek lasting solutions to the wave violent insurgency.

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INTRODUCTION

Approximately half million blindness worldwide is due to ocular trauma and is the most common cause of unilateral loss of vision, especially in developing countries.[1,2] An improvised explosive device (IED), also known as a roadside bomb, is a homemade bomb constructed and deployed in ways other than in conventional military action and are very destructive causing a various degrees of ocular injuries.[3] Ocular injuries account for about 5-13% of battle field casualties[4-6] Ocular blast injuries may be either primary, secondary, tertiary or quaternary respectively due to direct effect of blast wave, effect of fragments/debris from explosion, structural collapse and other mechanisms such as thermal, chemical injuries to eye and ocular adnexea. In line with the current insurgency bomb blast explosions in parts of northern Nigeria, there is need to identify the common associated ocular injuries with the view to recommending preventive measures and providing adequate resources to meet the challenges. The purpose of this series is highlight the pattern of ocular injuries as a result of recent bomb explosions in Nigeria

Correspondence to: Dr. Ugochukwu A Eze
Clinical Services Department, Katsina Eye Centre,
Katsina, Nigeria
Email: ugoreeze@gmail.com

METHODOLOGY

This was a prospective interventional case series of consecutive patients with ocular injuries that followed various detonation of improvised explosive devices (IED) that occurred between December 2011 and November, 2012 in parts of northern Nigeria who were brought to the

emergency room of the National Institute of Ophthalmology who were referred from sister hospitals after being stabilized by a trauma team. Inclusion criteria were any form of ocular injury from IED. All had ophthalmic evaluation by the ophthalmology team on call led by a consultant. Patients had visual acuity (VA) testing (with the Snellen's chart or finger counting where indicated), torch light and slit lamp examination and B- Scan. Patients with open globe injury had examination under anaesthesia and surgical repair as indicated.

Two patients underwent cornea repair and FB removal, one had pars plana vitrectomy (PPV) in India and one with NPL vision in the left eye was rehabilitated and artificial eye was offered. The demographic (age, sex, occupation), clinical (Visual acuity, laterality, extent of tissue involvement) and operative data was entered into preformed questionnaire and analyzed with SPSS V16

RESULTS

Seven eyes of five patients (2 patients with bilateral involvement) were recruited in the series with a mean age of 20 years (7-29 years), 3 males and 2 females (male to female ratio of 1.5: 1). Only one of the seven affected eyes had presenting VA of 6/60, 4 had hand motion (HM) and 2 had non perception of light (NPL) – fig.1 Four eyes (57.1%) had closed globe injury while the other three (42.9%)had open globe injuries. Individual ocular and adnexal injuries were as follows: lid laceration, corneal laceration, corneal foreign body, hyphaema, cataract vitreous haemorhage and retinal detachment – fig.3. Fig. 1 also shows scars from healed facial injury and left lower lid ectropion from cicatrization. At the end of 1year follow up, the final VA remained essentially the same except for the patient with vitreous haemorhage who had pars plana vitrectomy.

Figure 1: show left eye phthisis bulbi in a blast survivor before (a) after rehabilitation (b)

Figure 2: bar chart showing distribution of presenting VA in affected eyes

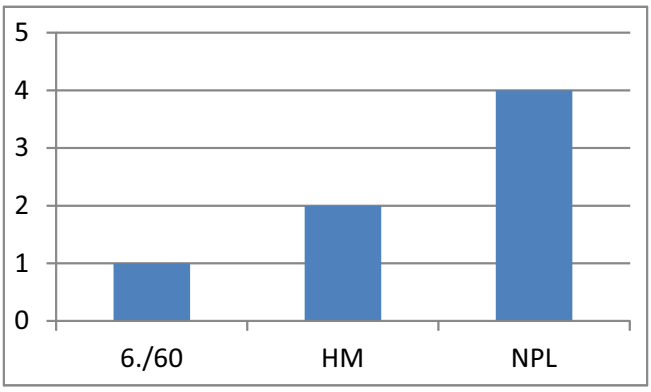
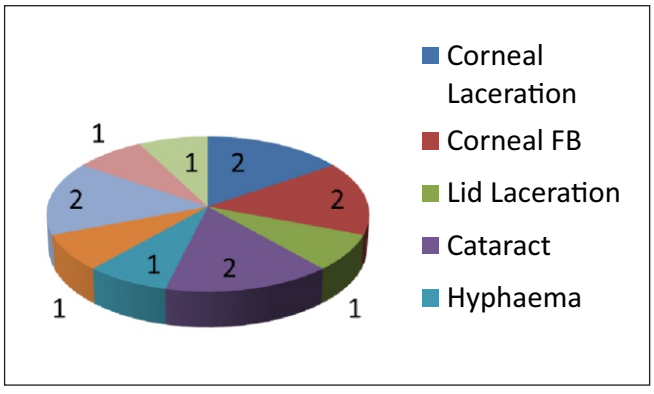


Figure 3: showing distribution of specific ocular injuries in the series



DISCUSSION

Nigeria is being plagued by about two decade's long challenge of insurgency. The 2018 Global Terrorism Index ranks Nigeria 3rd in the world and leading in Africa. The same report estimates the total fatalities 2016 – 2018 to be 8,304.[8] IED related injuries are said to be responsible for 32% and 38% of combat related deaths and injuries respectively.[9-11]

IED related ocular injuries are mostly associated with other life threatening injuries such as head, chest, abdominal and skeletal injuries. A larger series in Turkey has also reported traumatic brain injury which was not seen in this study.[12] This is most likely due to a small sample size and the fact that our institution was a mono-specialty centre.

Eye injuries from IED caused significant ocular morbidity as highlighted in this study where 85.7% (6/7 eyes) of affected eyes had poor visual outcome. This is as a result of severe distortion of structural and functional anatomy of the affected tissue.

In resource constrained settings like ours, such injuries exert a lot of pressure on the health system as most victims need multispecialty tertiary ophthalmic intervention such as penetrating keratoplasty (PKP), pars plana vitrectomy, retinoplexy, retinotomy, chorioretinoectomy and the likes. These procedures are not only very expensive but also carry poor visual prognosis. The time of these injuries occurred, these procedures were not readily available in the country. One patient had to travel to India to undergo a PPV.

In this series 4 out of 7 eyes had closed globe injury which all presented with poor vision and remained blind at the end of follow up except for one eye that presented with VA of 6/60. Unlike another series in India that reported ocular injuries in 16 patients following IED explosion in a commuter train which reported that 33.9% of affected eyes had minor and non-vision threatening injuries such as lid, conjunctival and corneal injuries and periocular haemorhages.[13] Like in our series, 3 eyes had open globe injury. Open globe injuries are thought to be from projectile objects or from tissue damage along air fluid interface from direct blast effect.[13] Corneal foreign body was found in one eye which is likely due to a projectile object. There is need to equip at least one tertiary institution in each geopolitical zone in Nigeria with equipment and man power needed to carry out retinal surgeries, National Eye Centre Kaduna currently about the only public health facility in Nigeria that does pars plana Vitrectomy.

CONCLUSION

Bomb blast explosion is associated with catastrophic blinding ocular pathology the most common of which are globe rupture, Intraocular foreign body, retinal detachment Phthisis and eventual blindness in most case. Thus there is need to provide needed equipment/manpower to manage the impact and also to seek lasting solutions to the wave violent insurgency. The visual outcome is dependent on impact of the explosive, VA at presentation, extent of tissue damage availability of prompt definitive intervention.

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