PATTERN OF FACIAL GUNSHOT AND BLAST INJURIES AMONGST LAW ENFORCING FORCES

Muhammad Nazir khan, Syed Amjad Shah*, Zakaullah Malik, Ashfaq Ahmed***, Muhammad Adil Asim**

Armed Forces Institute of Dentistry / National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Peshawar Medical & Dental College Peshawar Pakistan, **Military Hospital / National University of Medical Sciences (NUMS) Rawalpindi Pakistan, ***Pakistan Naval Ship Shifa Karachi Pakistan

ABSTRACT

Objective: To assesses the pattern of maxillofacial gunshot and blast injuries amongst law enforcing forces personnel.

Study Design: Descriptive Study.

Place and Duration of Study: Combined Military Hospital Lahore from Jan 2010 to Dec 2010.

Materials and Methods: This prospective study evaluated 52 patients from Jan 2010 to Dec 2010 at Combined Military Hospital (CMH), Kohat Pakistan. All patients in this study were males as fighting corps of law enforcing forces comprises only male soldiers and officers. Patients aged from 18 to 50 years with mean age 29.12 years ± 8.56 years. They were assessed for presence of gunshot and ballistic injuries by clinical examination and evaluation of necessary radiographic investigations.

Results: Nineteen patients out of total 52 patients had no other injury which accounts for about 36.9%. In maxillofacial area upper third of face was most frequent site to receive gunshot and ballistic injuries as 10 patients received injuries to upper face which measures about 19.2%. Along with maxillofacial area upper limbs were most common site affected as 14 patients received injuries to upper limbs which is 26.9% of all patients.

Conclusion: Gunshot wounds present a great challenge to oral and maxillofacial surgeons and a multidimensional team approach is required to rehabilitate the victims of gunshot injuries.

Keywords: Gunshot, Injuries, Maxillofacial, Terrorism.

INTRODUCTION

Gunshot and ballistic injuries are among the most devastating inflictions received by maxillofacial area. They are second to motor vehicle accidents as a cause of injury and death whereas fall is an important etiology among very young and elderly[1]. Because of complex nature of these injuries, gunshot wounds present a great challenge to oral and maxillofacial surgeons and a multidimensional team approach is required to rehabilitate the victims of gunshot injuries. Although about 12% of the body surface area is formed by head and neck, in a study the incidence of maxillofacial injuries among injured soldiers during conflicts from 1914 to 1986 was found to be 16%, which is higher than expected[2].

Miscreants mainly rely on suicide bombings, snipers, bomb blasts and ambushes against security force and civilian population[3]. According to various reports over 10,000 sustained injuries while around 4700 soldiers of law enforcing forces and 15000 civilians have lost their lives during this ongoing war against terrorism[4] Federally administered tribal area (FATA) which is the main battlefield at the western borders of Pakistan is a mountainous region. Miscreants usually make hideouts at peak tops which make security forces more expose to maxillofacial gunshot injuries. Because of intricate anatomy of this region victims suffer significant esthetic and functional compromise which increases the length of hospital stays and number of out patient clinic visits. Therefore the medical,

Correspondence: Dr Muhammad Nazir Khan, Department of Oral and Maxillofacial Surgery AFID Rawalpindi, Pakistan
Email: nazeerkhan68@yahoo.co.uk
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emotional and social impact of these injuries imposes a substantial burden on hospitals, families of patients, and society as a whole[5].

The aim of this study is to analyze the pattern of maxillofacial gunshot and ballistic injuries caused by terrorist attacks on law enforcing forces personnel.

MATERIAL AND METHODS

This descriptive study was conducted in Combined Military Hospital (CMH), Kohat, Khyber Pakhtunkhwa Pakistan from Jan 2010 to Dec 2010. Ethical committee of Combined Military Hospital Kohat has given the approval for this study. Law enforcing personnel sustaining gunshot and ballistic injuries to maxillofacial area and other body parts, due to terrorist attacks in tribal areas of Pakistan were included in the study. Exclusion criteria was patients receiving injuries due to causes other than gunshots or explosions, civilian patients, victims with severe burn injuries, or patients who were dead at the time of arrival in hospital. Fifty two patients who met the selection criteria were included in the study. Patients were assessed for presence of gunshot and ballistic injuries by clinical examination and evaluation of necessary radiographic investigations. Informed consent was taken from the patients or the close relative of the patients.

Demographic information including patients name, age, gender, rank, and date of injury was recorded. Maxillofacial injuries were categorized according to site of injury i.e. upper face, naso-orbitoethmoidal, zygoma, maxilla, mandible, soft tissue injuries, temporomandibular joint (TMJ) injuries and multiple fractures. Injuries to areas other than maxillofacial region were arranged according to the body part involved i.e. head, eye, thorax, upper limb, lower limb, and injuries to multiple body parts. Descriptive statistics i.e. frequency and percentage were used to analyze the data on SPSS version 17.

RESULTS

During the study period 52 patients were received at Combined Military Hospital Kohat with gunshot and ballistic injuries. All patients were male as fighting corps of law enforcing forces comprises only male soldiers and officers. Patients aged from 18 to 50 years with mean age 29.12 ± 8.56 years, which is on younger side because all patients were serving soldiers.

Distribution of injuries to different parts of body along with maxillofacial area is illustrated in table-1. All patients included in the study received maxillofacial injuries amongst which 19 patients had no other injury which accounts for about 36.9%. Along with maxillofacial area upper limbs were most common site affected as 14 patients received injuries to upper limbs which is 26.9% of all patients. Four (7.7%) patients received injuries to eye while 02 patients (3.8%) sustained injuries to head whereas three personnel (5.8%) were victims of lower limb injury. Only one patient (1.9%) received injury to thorax whereas 09 patients (17.3%) got injuries to multiple body parts other than maxillofacial area.

Table-2 shows distribution of injuries in maxillofacial area. Upper third of face was most frequent site to receive maxillofacial gunshot and ballistic injuries as 10 patients received injuries to upper face which measures about 19.2%. About 7 patients (13.5%) had injuries to multiple bones of the face. Whereas naso-orbitoethmoidal area and mandible were the third most common areas of facial hard tissue to be affected as 5 patients (9.6%) each received injuries to aforementioned areas. Zygomatic, maxillary and dentoalveolar tissues were among the least common areas to be involved in maxillofacial gunshot wounds. Dislocation of TMJ was observed in 4 patients (7.7%), which was believed to be caused by sudden shout by the victim of blast injury. Two of the patients who had TMJ dislocation also sustained injury to their ear drum. In 12 cases (23.1%) bullet or shrapnel caused injury to soft tissues of face only without damaging any facial skeleton.

DISCUSSION

Extremism and violence has become anonymous threat for the peace of world for a decade or so. Attacks in different parts of world including world trade centre, London attacks, Bali attacks in Indonesia and various bombings in different cities of Pakistan are few examples of intimidating activities of various terrorist organizations. Miscreants and extremist organizations have established themselves at various parts of world and are using this deteriorating law and order situation for their interest. Now a days miscreants are not only targeting the government installations but are pursuing their unlawful activities against civilian population as well. However the present study was carried out to determine the pattern of gunshot injuries among the law enforcing forces.

Anti-terrorist operations in FATA are quite unconventional as enemy strategies are primarily based on violence and there is neither any uniformed enemy nor any defined front lines[6]. The complex geographical situation of FATA at Pak-Afghan border complements the guerrilla war tactics of enemy. Outlaws mainly rely on ambushes, sniper shooting, suicide attacks, bomb blasts and improvised explosive device (IED) against the security forces. They use rifles and guns capable of causing high velocity avulsive and penetrating injuries and IEDs, which are destructive homemade devices made of explosives like trinitrotoluene (TNT), C4 plastic explosives etc. Miscreants mainly use IEDs to target convoys of armed forces while forward operating bases are their main target during ambush attacks.

Explosions result in four different types of injury which comprise primary injury (overpressure or implosion injury as a result of blast wave), secondary injury (caused by projectiles from primary bomb fragments or secondary fragments), tertiary injury (caused by whole body translocation due to blast wave energy) and quaternary blast injury (due to fire and heat generated from explosion)[7]. Gunshot injuries to maxillofacial area have functional, esthetic and emotional consequences and have long term impact on quality of life of the victim. The role of maxillofacial surgeon is to recognize not only the physiological effects but also the psychological consequences of these ballistic and gunshot injuries.

Table-1: Maxillofacial and associated injuries amongst law enforcing forces personnel (n=52).

Site	Frequency	Percentage
Maxillofacial only	19	36.5
+head	02	3.8
+eye	04	7.7
+thorax	01	1.9
+upper limb	14	26.9
+lower limb	03	5.8
+multiple injuries	09	17.3
Total	52	100

+ indicates injuries in addition to maxillofacial area.

Table-2: Distribution of injuries in maxillofacial region (n=52).

Site	Frequency	Percentage
Upper third	10	19.2
Nasoorbitoethmoidal region	05	9.6
Zygoma	03	5.8
Maxilla	03	5.8
Mandible	05	9.6
Dentoalveolar	03	5.8
Soft tissue only	12	23.1
TMJ dislocation	04	7.7
Multiple injuries of face	07	13.5
Total	52	100

The fighting corps of law enforcing directly involved in the anti-violence operations have only male soldiers and officers so all the afflicted personals in this study were male and most of them were towards younger side of the age group (mean age 29.12 ± 8.56 years). In another study conducted in Iraq, terrorist attacks affected wide range of age groups (3 to 68 years) and affected both sexes (male 63%, female 37%) because it included both civilian population and armed forces victim[2].

Since pattern of gunshot injuries is dependent upon the protective measures taken, unprotected body zones are involved in a larger proportion of injuries, particularly the extremities and the head and neck region[8,9]. Protective gadgets used by law enforcing forces of Pakistan are helmets and bullet proof jackets that protect the head and chest from gunshot injuries. The injuries to the chest were due to bullets with entry points in maxillofacial area and exit in chest near at or around scapula. The reason for such pattern of chest injuries is due to snipers sitting at hill tops. Therefore gunshot injuries to head and thorax were very few (3.8% and 1.9% respectively) in this study which illustrates the role of the protective gears very well. Dislocation of TMJ was observed in 4 patients (7.7%), which was believed to be caused by sudden shout by the victim of blast injury. All the four patients were followed up and they presented with complaint of pain or clicking in TMJ.

Gunshot wounds most commonly involve single region of body e.g. head/neck, thorax, abdomen, or limbs. On the other hand splinters and shrapnel from explosive devices like IEDs are likely to affect multiple body regions simultaneously[10]. Our results show that high number of patients had injury to one body region only i.e. maxillofacial area (36.5%) whereas only 17.3% patients had injury to multiple body regions. This could be because most of the victims included in this study were involved in ambush encounters and sniper shooting resulting in gunshot injuries rather than blast injuries which usually results in injuries to multiple regions of body. In a study[11] by Sheffy N et al, conducted on terror victims it was concluded that high number of victims (i.e. 58.3%) of gunshot injuries had injury to one region of body while only 27.4% victims of injuries due to secondary fragments from explosive devices.

During ambush attacks, sniper shooting and offensive attacks against terrorists head and neck, and maxillofacial area is highly exposed as protective helmets used by law enforcing forces does not have any protective shield to protect the face. Secondly terrorists try to aim for head and upper part of face to increase the number of deaths that resulted in high magnitude of injuries to upper part of face and naso-ethmoidal area both of which resulted 28.8% of total injuries to maxillofacial area. Breeze J et al in their study described the significance of combat eye protection (CEP) in reducing the ballistic facial and eye injuries[12]. They explained that facial wounds were present in 25.1% of servicemen wearing CEP as compared to 39.6% who chose not to wear CEP similarly use of CEP resulted in significant decrease in incidence of eye injuries. Likewise in our study eye and upper third of face were involved in gunshot and ballistic injuries quite significantly (more than 30%). Therefore addition of combat eye and face protection in the form of protective facial shields, ballistic goggles, or ballistic sun-glasses could result in significant reduction of maxillofacial and eye gunshot and ballistic injuries.

Unlike gunshot injuries among civilian population which are mostly caused by low velocity handguns during interpersonal violence, injury pattern among security personnel present a more devastating pattern due to high velocity firearms used in military warfare[13]. Gunshot injuries of extremities that have single entry and exit wound, maxillofacial gunshot injuries result in avulsive and complex injuries and cause more functional and esthetic compromise. Thus ballistic and gunshot injuries to face not only increase the morbidity for patient but also cause increased financial burden on state as duration of hospital stays and frequency of Out Patient Department (OPD) visits is much greater than injuries to any other region of body.

CONCLUSION

Gunshot or ballistic injuries can cause significant damage to patient's life. Careful examination of head and neck region following gunshot or ballistic injuries is highly recommended to rule out injuries to vital structures such as brain, eye and neck. Over the past few years advancements in body armor

particularly chest protection jackets and ballistic helmets have resulted in significant reduction in gunshot and ballistic injuries to chest and head but proportion of gunshot injuries to exposed parts of the body particularly limbs and face has increased. Therefore improvements in protective equipment particularly addition of ballistic goggles or sheets can result in significant reduction in maxillofacial gunshot injuries.

CONFLICT OF INTEREST

The authors of this study reported no conflict of interest.

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