PATTERN OF COMBAT CASUALTIES IN WAR AGAINST TERROR AMONG SOLDIERS WEARING BODY ARMOR AT CMH PESHAWAR

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ABSTRACT

Objective: To determine the pattern of gun shot & explosive injuries in soldiers equipped with body armor and helmet.

Study Design: Descriptive study

Place and Duration of Study: Combined Military Hospital Peshawar, from 1st June 2008 to 30th May 2010.

Patients and Methods: All combat casualties received in 'Emergency reception' of Combined Military Hospital, Peshawar were included. Data was taken from the patient's medical charts and by personal evaluation and entered in a proforma. The variables used were age, use of helmet, cause of the injury, site of injury, Haemo-dynamic Status, conscious level, intensive care treatment duration, total hospital stay, return to work & mortality.

Results: A total of 516 combat casualties were received in 'Emergency reception' of Combined Military Hospital, Peshawar, Pakistan. All patients were males with a mean age of 31.22±7.858 years. Sixty nine percent (356) cases had injury due to splinters from Improvised Explosive Devices (IED) and 31% (160) had gunshot wounds. Seventy five percent (391) patients were haemodynamically stable while 24.2 % (125) were unstable. Penetrating Extremity Injury (PEI) was the commonest injury (71.9%) followed by Penetrating Injury of Face or Neck (PNFI) in 12.0% (62), Penetrating Torso Injury (PTI) in 8.9% (46) & Penetrating Injury of Cranial Vault (PCI) in 7.2% (37). Overall mortality was 64 (12.4%)

Conclusion: IEDs have become the weapon of choice in gorilla warfare by the terrorists in addition to guns, bombs, and anti-personnel mines. The use of body armor has decreased the mortality but the morbidity in terms of limb injuries has increased.

Keywords: Body armor, Combat causality, Injury patterns

INTRODUCTION

The Pakistan Army is primarily engaged in anti-terrorist operations in a vast tribal area and is fighting an unconventional enemy. It is a gorilla war by the terrorists relying on IED's, suicide bombings, snipers and ambushes. The armed forces has evolved different security measures for the safety of its soldiers including specialized training in dealing with the terrorists and to counter their tactics, it has also equipped its soldiers with body armor, helmets and vehicular body armors. Despite the experience gained during these conflicts and the technical improvements made by our military surgeons, enemy tactics are still evolving and has continued to result in a large burden of complex extremity injuries. The evolution of tactics utilizing highly lethal IEDs in addition to guns, bombs, and anti-personnel mines have afforded the enemy a greater capability to take the life and limb of soldiers.

Extremity injuries have been reported to comprise approximately 50% of all combat wounds[1]. However, if injury occurs to exposed portion of torso or head, neck or face; mortality rate is high[2]. Utilization of individual body armor has dramatically reduced thoracic injuries and has decreased the lethality of gunshot wounds. Explosive mechanisms of injury, with IEDs being the most common, account for over 75% of all combat casualties[3]. The lethality of IEDs coupled with the protection of the thorax and abdomen provided by individual body armor has resulted in increasingly severe extremity injuries. Further more torso body armor worn by Pakistan

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Armed Forces does not protect the abdomen and the thorax from sides.

This analysis of combat casualties will help in identifying the pattern of injuries in this non conventional war and will allow for improved military personnel protective measures and better treatment of injured soldiers. Collection and careful analysis of combat casualty care statistics will allow the military medical system to more effectively treat deployed soldiers. Additionally, the information uncovered by analysis of these statistics may also provide the impetus for the leadership of the Pakistan Armed Forces to continue to improve upon personnel protective measures, such as individual body armor; and to plan for mine-resistant ambush-protected vehicles, in order to protect life and limb of Pakistan military service members and conserve the fighting strength.

PATIENTS AND METHODS

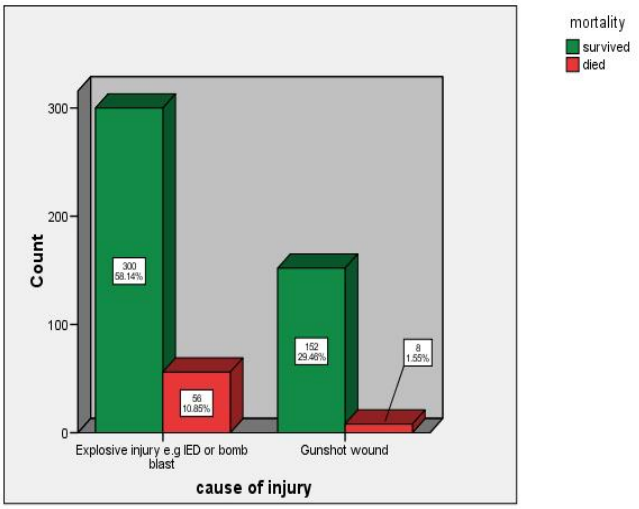
This descriptive study was conducted over 24 months, of all combat casualties received in 'Emergency Reception' of Combined Military Hospital, Peshawar between 1st June 2008 and 30th May 2010. CMH Peshawar is a tertiary care hospital nearest to the tribal area where military operations are in progress. Following patients were excluded from study; those who were not wearing torso protective gear; who were having injuries due to causative mechanisms other than GSW or explosions; who were having any co-morbid condition like HTN, asthma or IHD etc. Data was taken from the patient's medical charts and by personal evaluation. Data was recorded on a proforma. The parameters recorded were age, cause of the injury, helmet presence, site of injury (pti/ pei / phni), haemo-dynamic status, conscious level, intensive care stay, ward admission duration, total hospital stay, morbidity & mortality. The term 'Penetrating' in PTI (Penetrating Torso Injury), PEI (Penetrating Extremity Injury) & PHNI (Penetrating Head & Neck Injury) implies that shrapnel or bullet has penetrated through skin, subcutaneous tissue and deep fascia. 'Unstable' Haemo-dynamic Status implies that combat casualty received has systolic B.P less than 100 mmHg. Data entered and analyzed by using SPSS (version-15). Descriptive statistics were used to describe the data i.e. mean and standard deviation (SD) for quantitative variables while frequency and percentages for qualitative variables.

RESULTS

During the study period, 516 combat casualties were received in 'Emergency reception' of Combined Military Hospital, Peshawar, with injuries due to gunshots or explosive mechanisms (including IED injuries). All patients were males with a mean age was 31.22±7.858 years. A total of 356 (69 %) cases had primary cause of injury being splinters from IED's or bomb blast; while 160 (31 %) cases had gunshot wounds. The impact of causative agent on mortality was an important factor as demonstrated in Fig. 1. Three hundered and ninty one (75.8 %) patients were haemodynamically stable on arrival while 125 (24.2 %) patients were unstable. Mean duration of stay in hospital was 10.82 days, with minimum 1 (most such cases were brought in dead because of fatal head injury) and maximum 38 days. All patients were evacuated to operation theatre, after necessary investigations, for respective operative treatment according to injuries. The most frequently occurring injury was PEI (Penetrating Extremity Injury) occurring in 371 cases (71.9%); PNFI in 62 (12.0%); PTI in 46 (8.9%) & PCI (Penetrating Injury Of Cranial Vault) in 37 (7.2%). Overall mortality was 64 (12.4%) which was mainly due to uncontrolled haemorrhage, or lethal cranial vault injury or major vascular injury of exposed neck region. A total of 55.8% of survivors could not return to normal active service. They were either down categorized or invalided-out-of service (Fig 2).

DISCUSSION

Almost all cases having PCI were not wearing helmet at time of injury and most of them died on spot or during evacuation. The cases that sustained PTI, in spite of wearing of torso body armour, were those who were effected from weaker parts of body armour, especially sides. Most of these cases were brought-in-dead to mortuary for external examination.



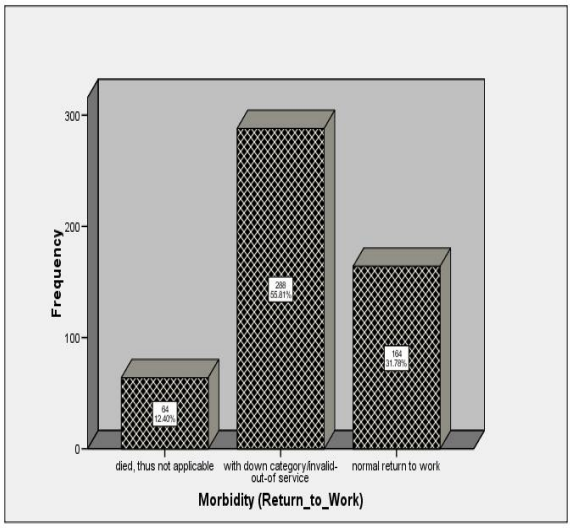


Fig. 1: Description of mortality according to the cause of injury (n=516).	Fig. 2: Description of morbidity of mortality (n=516).

There are numerous factors that differentiate the combat medical experience in the present anti-terrorist operations in FATA from those encountered in the 1965 & 1971 wars. Foremost is that Pakistan Armed Forces are primarily engaged in anti-terrorist operations in a gorilla war, in which enemy tactics are primarily based on terrorism. There is no uniformed enemy, no defined front lines or order of battle[4]. Most combat casualties occur due to ambush, suicide bombing or increasingly from the use of improvised explosive devices. IEDs are destructive devices constructed from home-made, commercial, or military explosive material that are deployed in ways other than conventional military means[5]. IEDs are designed to destroy, disfigure, or otherwise interdict military assets in the field and include buried artillery rounds, antipersonnel mines, and "car bombs". IEDs have become a greater threat to Pakistan Armed Forces especially during mobility. US forces have encountered almost 63% of the deaths due to IEDs in combat operations, Operation Iraqi Freedom/ Operation Enduring Freedom[4] (OIF/OEF) and Afghanistan[5]. From June 2003 to June 2009, 1842 coalition soldiers were killed by IEDs in Iraq, and 487 died as a result of similar devices in Afghanistan[6]. The lethality of IEDs is demonstrated by the recently reported percent killed in action (KIA) rate of 26.5% [7].

The current conflict has witnessed a substantial increase in the proportion of injuries caused by explosive mechanisms. In addition to IEDs, explosive mechanisms of injury include mortars, rocket-propelled grenades, and landmines. Over the course of the 20th century, a generalized trend has occurred whereby the number of "casualties due to explosives" has increased relative to those caused by gunshots. In World War I, 65% of combat casualties resulted from gunshots[8]. This decreased to 35% during Vietnam[9] and has been reported to be around 20 % in recent studies of OIF/OEF[10]. An analysis of the epidemiology of injuries in OIF/OEF documented that 81% of all injuries were due to explosions[11].

Wounding patterns during operation Al-Meezan & Rahe-Raast were also different from 1965 & 1971 war. They are similar to injury pattern inflicted on US forces in OIF/OEF. The distribution of wounds is reflected by the different mechanisms of injury. Gunshot wounds most commonly involve single body regions (e.g., head/neck, thorax, abdomen, or extremities) and characteristically have a single entrance and exit wound. In contrast, explosive injuries tend to simultaneously affect multiple body regions. The percentage of head and neck wounds in 'operation Al-Meezan & Rahe-Raast' has increased relative to prior conflicts, while

thoracic and abdominal injuries have decreased.

US Armed Medical Forces sensed this change in injury pattern in OIF/OEF, and since 2006, US Armed Forces have also increasingly deployed mine-resistant ambush-protected vehicles to combat the deleterious effects of IEDs. These vehicles are heavily armored vehicles with "V"-shaped hulls that deflect explosive forces originating below the vehicle away from the passenger compartment. Reports in 2008 attributed a 99% reduction in fatalities from roadside bombs to the use of mine-resistant ambush-protected vehicle[12]. As of 2008, only eight soldiers had been killed due to blasts in which mine-resistant ambush-protected vehicles were targeted, and most of those soldiers killed were partially exposed in the vehicle's turret[13].

As a result of such military personnel protective measures, a larger proportion of injuries are being encountered in the unprotected body zones, specifically the extremities and the head and neck region. The blunt impact of blast mechanisms may also be responsible for an increased risk of extremity fracture and injuries to the head and axial skeleton. Improved battlefield first-aid training, strategic placement of 'advanced paramedics', decreased time to medical evacuation, and sophisticated surgical care all contribute to an exceptionally low case fatality rate for soldiers with total personnel protective gear, and injured on the battlefield.

The low case fatality rate does not, however, reflect the severity of injury sustained and, in many cases, soldiers are surviving more significant injuries than ever before. Stansbury et al. conducted a review of the US Joint Theater Trauma Registry and Military Amputee Research Program databases and reported on the rate of major extremity amputations, defined as an amputation proximal to the wrist or ankle[12]. It was found that 7.4% of all casualties with extremity injuries who were unable to return to duty within 72 hours of injury sustained major extremity amputations. Nearly 88% of these amputations were a result of an explosive mechanism, and 18% of these amputees sustained more than one major extremity amputation. Ramasamy et al. provided a descriptive analysis of all combat casualties presenting to a British Military Field Hospital during a 10-month period in 2006 as a result of IED blast[13]. Extremity injuries were found in 86.7% of all casualties. Fractures were present in 52% of all casualties and amputations were reported in 7% of the surviving soldiers and 50% in soldiers KIA (Killed in Action) or DOW (Died of Wounds). These injury patterns not only have important implications for the present conflict, but will also substantially impact the future as the burden of ongoing care for injured soldiers.

CONCLUSION

IEDs have become the weapon of choice in gorilla warfare by the terrorists in addition to guns, bombs, and anti-personnel mines. The use of body armor has decreased the mortality but the morbidity in terms of limb injuries has markedly increased. Personnel protective measures, such as individual body armor, mine-resistant ambush-protected vehicles and rapid casualty evacuation can help reduce the burden of injuries.

REFERENCES

1. Covey, DC. From the frontlines to the home front: the crucial role of military surgeons. J. Bone Joint Surg. 2009; 91-A: 998–1006.
2. Mazurek, MT, Ficke, JR. The scope of wounds encountered in casualties from the global war on terrorism: from the battlefield to the tertiary treatment facility. J Am Acad Orthop Surg. 2006; 14:S18–23.
3. Covey, DC. Blast and fragment injuries of the musculoskeletal system. J Bone Joint Surg. 2002;84-A:1221– 34.
4. Bird, SM, Fairweather, CB. Military fatality rates (by cause) in Afghanistan and Iraq: a measure of hostilities. Int J Epidemiol. 2007; 36:841–6.
5. Belmont, PJ, Goodman, GP, Zacchilli, M., et al. Incidence and epidemiology of combat injuries sustained during "The Surge" portion of Operation Iraqi Freedom by a US Army Brigade Combat Team. J Trauma 2010; 68(1):204-10.
6. Beebe, GW, DeBakey, ME. Death from wounding. In Battle Casualties, , Thomas CC, Springfield, IL, 1952: pp. 74–147.
7. Hardaway, R. M. Vietnam wound analysis. J. Trauma .1978; 18:635–43.
8. Owens, BD, Kragh, JF, Jr., Macaitis, J, et al. Characterization of extremity wounds in Operation Iraqi Freedom and Operation Enduring Freedom. J. Orthop. Trauma. 2007; 21:254– 57.
9. Owens, BD., Kragh, JF., Wenke, JC, et al. Combat wounds in Operation Iraqi Freedom and Operation Enduring Freedom. J. Trauma. 2008; 64:295–99.
10. Vanden Brook, T. Pentagon: New MRAPs saving troops' lives. USA Today, April 4, 2008. Available at: http://www.usatoday.com/news/military/2008-04-03-MRAPsN.htm. Accessed August 25, 2009.
11. Knight Ridder. New concerns after 2 die in MRAP. May 6, 2008. Available at: http://www.military.com/news/article new-concerns-after-2-die-in-mrap.html. Accessed August 25, 2009.
12. Stansbury, L. G., Lallis, S. J., Branstetter, J. G., et al. Amputations in U.S. military personnel in the current conflicts in Afghanistan and Iraq. J. Orthop. Trauma. 2008;22(10):43– 46.
13. Ramasamy, A, Harrisson, SE., Clasper, JC, Stweart MP. Injuries from roadside improvised explosive devices. J. Trauma. 2008; 65:910–14.