

ANAESTHESIA PERSPECTIVE OF COMBAT INJURIES AT SOUTH WAZIRISTAN AGENCY-A FIELD EXPERIENCE OF WAR ON TERRORISM

Maqsood Ahmad, Mumtaz Ahmad*

Pakistan Naval Ship Rahat Hospital, Karachi, *Medicare Hospital Jeddah

ABSTRACT

Objective: To determine the presentation form of combat injuries, different aspects of anaesthesia management and methods of effective pain control inside the field hospital.

Study Design: A descriptive study.

Place and Duration of Study: South Waziristan Scouts Hospital, South Waziristan Agency, Wana, Khyber Pakhtun Khawa province from March 2007 to August 2009.

Patients and Methods: A descriptive review of the type of injuries sustained by the troops including local civil population reporting to South Waziristan Scouts (SWS) Hospital from March 2007 to Aug 2009. All patients of combat related injuries reporting to SWS Hospital were included in this study excluding elective surgical cases, gynaecological cases and routine medical patients. Initial anaesthesia management, pain control in anaesthetized patients or analgesia provided without anaesthesia in injured patients and evacuation process of emergencies to tertiary care hospital are discussed. The data was collected from hospital records including operation theatre and was analyzed in the SPSS version 14 for windows in the form of frequency of patients.

Results: A total of 149 male (age 30 ± 15) patients were managed at SWS hospital after sustaining combat related injuries. General anaesthesia was given to 61% patients whereas 26% were operated under spinal anaesthesia. Deaths reported were 12.75% comprising 1.3% brought in dead during combat, 2.68% after cardiopulmonary resuscitation inside the hospital, 2.68% homicides by miscreants, 0.67% suicide, 0.67% of bomb disposal squad during mines search operation and 4.69% due to helicopter crash due to snow fall. Firearm and splinter injuries were the commonest in active encounter followed by IED linked injuries. Stray bullets injured a soldier in the chest causing pneumothorax and minor injuries to other 2%. Suicide 0.67% of permanent residing troop and homicides of 2.68% soldiers by the miscreants were documented. The time for casualty arrival in the hospital was 15 min to 10 hours depending upon the distance of incidence from the hospital. Ketamine was the drug of choice for induction and pain management followed by thiopentone either alone or in combination with ketamine. nalbuphine IV and diclofenac sodium IM were given to all patients for analgesia. Full stomach and lower limb emergent cases were operated under spinal anaesthesia using hyperbaric 7.5% bupivacaine. Poor supply of medicines, deficient staff and skilled workers, inefficient chain of evacuation and geographical problems were the major difficulties in that area.

Conclusions: Active initial management and team work in a fully equipped setup have the added advantage. Extreme cold, poor team work, hitches in the evacuation, support and supplies were the major problems which if covered can possibly help to manage wounded persons at source.

Keywords: Anaesthesia, Combat injuries.

INTRODUCTION

The South Waziristan Scouts is one of major Corps of Frontier Corps of KPK province covering large area of FATA (Federally Administered Tribal Area). Most of the camp area

including mess and hospital was constructed by the British in 1900 onward. Despite early establishment of this hospital and large 2 double story buildings, a female ward, x-ray, laboratory and one room operation theatre, only one doctor was looking after this hospital for a long time. It was in 1996-1998 that different specialists joined this hospital. District Headquarter Hospital, Wana, is an agency hospital operating outside the camp area with inconsistent specialist presence.

Correspondence: Dr Maqsood Ahmed, Classified Anaesthetist, PNS Rahat, Karachi.

Email: doctormaqsood@gmail.com

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Nearest evacuation area for local population of South Waziristan Agency is the Dera Ismail Khan and Multan.

The war on terrorism which is profoundly aggravated by unpredictability has created a situation of continuous stress for soldiers and locals providing bases for psychological illnesses. The type of injuries sustained depends upon the mode of acquiring these injuries, type of weapon used and the self protection methods. The extremity injuries due to IEDs contribute a major portion of these injuries which is only superseded by firearm injuries. IEDs range from rudimentary homemade explosives to very sophisticated weapon systems and has become the most significant threat to troops engaged in this war on terrorism¹.

Ketamine anaesthesia with spontaneous breathing of air was a common method inside the hospital and pulse oximeter was a very useful monitoring tool². Opioids are given along with ketamine or alone for postoperative pain.

The problems of this area are many folds and to rectify them, lots of funds are required. Poor evacuation to bigger tertiary care hospitals, deficient doctors and staff with inadequate supply of stores are major hassles. However war is manageable by improving various demanding areas by slow and steady process.

The study describes various aspects of anaesthesia management of casualties reported from March 2007 to Sep 2009, peri-operative analgesia choices, problems encountered during management and suggestions for future improvement. A good repute with local population can be developed through frequent medical camps, eye surgery camps and malaria eradication program. The provision of clean drinking water will safeguard the gastrointestinal diseases and education of local population will create a safe working environment for troops by developing awareness among habitants.

PATIENTS AND METHODS

All male combat related injury patients reporting to South Waziristan Scouts Hospital at South Waziristan Agency, Wana, from March 2007 to Aug 2009 were included in this study. Elective surgical cases, gynaecological cases, female patients and routine medical patients were excluded. The data for this study was collected from the hospital record while managing all injuries at the same place by same person. Initial anaesthesia management, pain control in anaesthetized patients or analgesia provided without anaesthesia in injured patients and evacuation process of emergencies to tertiary care hospital are discussed. The working problems of this area are briefly described in anaesthesia perspectives.

All injured cases or deaths due to combat are included. Similarly deaths after cardiopulmonary resuscitation are included in the study. Road traffic accidents, injuries due to personal conflicts, patients of chronic and acute surgical or medical problems are excluded. Antiseptic dressings of injuries on 2nd hospital visit and daily sick reports of routine cases are not part of this study. Similarly all injuries treated in forward trauma centre (FTC) (a setup run by army in different areas) are not included. The variables included were nature of injury, time of reporting in the hospital, hypovolemic shock, operation performed, anaesthesia management, peri-operative analgesia, evacuation method and problems encountered. The study is limited to only SWS Hospital and has its limitations like only those cases were selected which reported to SWS whereas other setups are also working in that area. The patients included in this study are only part of self experience and did not depict the whole image. The results are analyzed by SPSS (version 14 for windows) for presentation after collecting the data during study period.

RESULTS

This study constituted of 149 male (age 30 ± 15) patients brought to the hospital for

management. Majority of patients, 91 (61%), were managed *ab initio* under general anaesthesia and others, 39 (26%), were given spinal anaesthesia while ketamine was the drug of choice for majority, 110 (74%). Deaths reported during this time period due to war injuries were 19 (2.7%). The helicopter crash occurred due to snow fall, claiming all passengers (total 07 including pilots). Firearm and splinter injuries were the commonest kind of injury in encounters followed by IEDs injuries. Stray bullets inside the camp injured a soldier in the chest causing pneumothorax, minor injuries to 3 (2%) and homicides of 4 (2.68%) soldiers by the miscreants after kidnapping were documented. The time for casualty arrival in the hospital was 15 min to 10 hours depending upon the distance of incidence from the hospital. General anaesthesia cases had either total intravenous anaesthesia using ketamine IV alone or in combination with diazepam IV and nalbuphine IV, nalbuphine IV, or intermittent positive pressure breathing following intubation. Spinal anaesthesia was used for lower limb surgery and full stomach cases. Combination of inhalational agent (halothane) was used in mixture of oxygen (O₂) and nitrous oxide (N₂O). Poor supply of medicines, equipment, deficient staff and skilled workers, inefficient chain of evacuation and geographical problems were the major difficulties in that area.

Various agents are useful for pain relief following injuries like ketamine IV, nalbuphine IV and diclofenac sodium IM either alone in recommended doses or in combination for balanced analgesia but in low doses. Ketamine had the major advantage of providing rapid anaesthesia and analgesia without jeopardizing airway. Suxamethonium 1-2 mg per kg IV and atracurium 0.5 mg per kg IV in initial doses were used as muscle relaxants. The anaesthesia was maintained either spontaneously on ketamine patients or on mixture of oxygen (O₂), nitrous oxide (N₂O) and halothane 1% to 2% titrated to the effect. Ketamine anaesthesia was sometimes supplemented with inhalational anaesthesia

where required. Blood for transfusion was drawn fresh due to non-availability of blood in blood bank; otherwise haemaccel and ringers lactate solutions were initially started depending upon the condition of the patient. The triage area was

Table-1: Descriptive statistics of anaesthesia management.

Parameter	No	Frequency (%)
Total cases	149	100
General anaesthesia	91	61
Spinal anaesthesia	39	26
Overall deaths	19	12.75

Table-2: Injury distribution of cases.

Parameters	No	Frequency (%)
Small arm injury	100	67
Improvised explosive devices injury	30	20
Deaths due to helicopter crash	7	4.8
Homicide by miscreants after capture	4	2.68
Deaths during CPR inside the hospital	4	2.68
Brought in dead	3	2
Bomb disposal squad death during bomb disposal	1	0.67

just outside the operation theatre and all routes of evacuation were used depending upon the availability, weather, terrain and security. Overall limb injuries were very common due to IEDs resulting into long term disability in the form of below knee limb loss. Evacuation by helicopter was most effective and speedy followed by public transport on local single or double cabin vehicles.

DISCUSSION

The pattern of injuries in this area is like a gorilla war which operates on unpredictable grounds. Anti-terrorist operation is markedly different from outburst war as the enemy is hidden leading to late response to counter those mischievous attacks. At times it becomes impossible to differentiate friend from enemy as

terrorists resemble locals in their outfits and appearance while speaking the same language, except foreigners. Most of them are ruthless criminals who play in other hands and have no self agenda. Apparently their main aim is to spread panic and threaten the local population so as to command them and weaken the defence forces by their gorilla activities. There is no order of war and any defined demarcation in war on terrorism³.

The IEDs are the weapons of choice and have witnessed a substantial increase in the proportion of injuries by this mechanism⁴. The reported US deaths due to IEDs in Operation Iraqi Freedom and Afghanistan are 63%⁵. Latest study claimed lethality of 26.5% by the IEDs⁶. The reported difference in percentages is multi factorial and variable depending upon terrain, staff training, body armour, and prior search operations. A study by Ramasamy et al suggests improvements in vehicle protection may prevent the splinter of IEDs entering the passenger compartments and thereby reducing fatalities⁷.

The miscreant snipers were accurate and extremely fatal due to unpredictability. Although apparently successful, they failed to engage all troops in their disastrous trap. Kidnapping was a common threat and the procedure was simple. At a time they created a boulder obstacle on the road for the convoy and came one after another to rescue. A simulated friendly atmosphere thus produced led to kidnapping of troops within a few hours. Simple torturing and slaughtering after kidnapping happened on few occasions resulting in harassment and demoralization of troops. Psychological diseases were common due to stress and fear of unknown as the main contributing factor.

Stray bullets caused minor injury in 4 cases and a pneumothorax. A helicopter crash in rainy and cloudy winters claimed 7 lives and all had charred unidentified bodies with multiple fractures. The stable casualties were transferred to the tertiary care by road. Helicopter was called in emergent cases and travel time was 30 minutes

as opposed to 3-4 hours in the day time by road. Transport on army vehicle was sometimes impossible for days due to non-clearance of the road and threat of ambush. For emergency civil transport was readily available.

Pain management is an essential component of combat injuries and regional anaesthesia provides excellent pain relief for the operation and postoperatively⁸. Spinal anaesthesia was used in 30 patients for lower limb surgeries with excellent results. The continuous peripheral nerve blocks (CPNBs) provide excellent analgesia to war wounded patients but the experience is limited⁹.

The cornerstone of acute pain management has been the opioids despite their potential negative effects like respiratory depression. A multi model approach towards pain management is increasingly used and it encompasses regional analgesia with continuous epidural or peripheral nerve block infusions, judicious opioids, acetaminophen, anti-inflammatory agents, anticonvulsants, ketamine, clonidine, mexiletine, antidepressants and anxiolytics as options to treat or modulate pain at various sites of action¹⁰. Oral transmucosal fentanyl citrate has been studied in austere combat environment and recommended¹¹ but we used nalbuphine hydrochloride IV and IM. The continuation of pain control throughout operation, postoperatively and during transport demands multimodel balanced analgesia. The importance of pain management is stressed by the Surgeon General of the British Defence Medical Services in 2007 by making it one of his three 'main efforts' (personal communication, Lt General L. Lilly white L/RAMC, March 2010)¹².

The emergency field anaesthesia of short duration is best provided by ketamine hydrochloride either alone or combined with benzodiazepines and opioids. Traditionally field anaesthesia was based on a simple and reliable technique where minimal equipment and drugs are required while ensuring rapid and safe recovery. Ketamine alone fulfills the criteria for

war injuries management and had been declared “drug of war” in one study¹³.

No single regime for anaesthesia is recommended for disaster management/ combat injuries but a balanced approach had been used in all cases considering pattern of injury, hypovolemia, surgical emergency, surgical procedure plan, availability of operation room staff and equipment. Unfortunately both staff and equipment are either deficient or not readily available. Utilizing the adaptation of more practical portable equipemnet to deliver anaesthesia for life or limb saving situations can be a different experience from customary anaesthesia practices in operation room¹⁴.

CONCLUSION

Active initial management comprising effective pain control of war like injuries can save precious lives in the beginning of incidence. A team work of trained doctors and staff working in shifts in a fully equipped setup have the added advantage. Extreme cold, poor team work, hitches in the evacuation, support and supplies were the major problems which if covered can possibly help to manage wounded persons at source.

Conflict of Interest

This study has no conflict of interest to declare by any author.

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