

ORIGINAL ARTICLES

DISASTER MANAGEMENT IN COMBINED MILITARY HOSPITAL QUETTA

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ABSTRACT

Objective: To review the mass casualty management at Combined Military Hospital Quetta (CMH QTA), from 2012 to 2015 and to recommend measures for enhancement of capabilities in order to handle major mass casualty events.

Study Design: Descriptive, cross sectional.

Place and Duration of Study: Combined military hospital Quetta, from Jan 2012 to Dec 2015.

Material and Methods: This study is a review of the patients brought to CMH QTA, in different types of mass casualty events from 2012 to 2015. The type of trauma, the procedure carried out and the patient outcome in each case was recorded. The data were analyzed and based upon the mortality and morbidity of casualties, the evaluation of facilities available and required was carried out as per Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards.

Results: Over a period of four years, out of 3507, the highest number of casualties (42%) were received in year 2013. Civilians represented the commonest victims (79%) followed by army personnel (13%) and frontier corps (8%). The gunshot wounds and Improved Explosive Device (IED) blasts were on the top (53.5%) as a cause of mass casualty followed by road traffic accidents (37.5%). The highest number of patients (89%) underwent minor procedures like debridement, stitching and aseptic dressing. Twenty five percent of patients required a team work of various surgical specialists.

Conclusion: The existing resources are sufficient for managing minor and moderate mass casualty scenarios but proper planning and enhancement of resources (equipment, infrastructure and personnel) is essential to cope with any probable major mass casualty event. We recommend training of paramedical staff for receiving, triage, resuscitation and definitive management of casualties.

Keywords: Casualty, Management, Mass, Mortality, Trauma.

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INTRODUCTION

According to World Health Organization, disaster is a sudden phenomenon which reaches a magnitude that it requires external assistance¹. Mass casualty events can be classified into mild, moderate and major². At Combined Military Hospital Quetta (CMH QTA) simultaneous arrival of seven to thirty casualties was termed as minor mass casualty event. Thirty one to fifty casualties received simultaneously represent moderate while more than fifty represent a major mass casualty event². Each year the disasters cost huge amounts of money and lots of lives¹. From

1980 to 2010, 138 incidents of mass casualty occurred costing more than eighty thousand lives while fifty million people were traumatized directly or indirectly³. Approximately 90% of all disasters hitting Pakistan are floods⁴. The flood in 2012 claimed 500 deaths, affected 15 million people and 14000 villages⁴. Unlike some disasters like storms and floods, the disasters like earthquakes, different forms of terrorism, industrial, train and road traffic accidents cannot be predicted⁵. Being the frontline state of war against terrorism, Pakistan is continuously bearing the brunt of terror attacks which are being carried out with newer tactics on each passing day⁶.

The main aim of disaster management in health care system is to reduce the impact of damage by controlling the mortality and

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morbidity of the casualties by early intervention and follow up⁷. Moreover routine patient management and safety of the staff is also important for an effective disaster management strategy in health care system⁵. The in charge of the disaster management must be someone who is experienced in leadership and disaster management¹.

Mass casualty incidents can occur at any time but damage can be minimized by proper strategy at rescue efforts⁸. In disaster situations the hospital resources, management plans and replenishment strategies fail⁹. The poor preparedness increases the vulnerability to massive damage in disaster situations¹⁰. The geo-climatic situation of Balochistan province, the instability in Afghanistan and Indian dream of hegemony in South east Asia, predisposes Balochistan to many types of disasters¹¹. In order to remain prepared for any disaster, a multi-hazard disaster management plan must be devised to be flexible enough for meeting most of

from hospital ethics review committee. The sampling technique was non-probability consecutive and all disaster casualties brought to CMH Quetta during the period of study were included. The casualties received in CMH QTA as a result of various mass casualty events were broadly categorized as alive and brought in dead. The casualties received as alive were divided into those who were admitted and those who were managed as outpatients. The duration of stay either less than or more than 7 days, the type of procedure and the final outcome in terms of death or discharge of the patients were recorded. Data of the type of trauma like gunshot wounds, Improvised Explosive Devices (IEDs), bomb blasts or road traffic accidents was also recorded. Number of hospital admissions, duration of hospital stay and the number of deaths were taken as the end points of the audit of primary response, clinical audit and mortality audit respectively. This was followed by an analysis of measures taken at CMH Quetta to prepare for

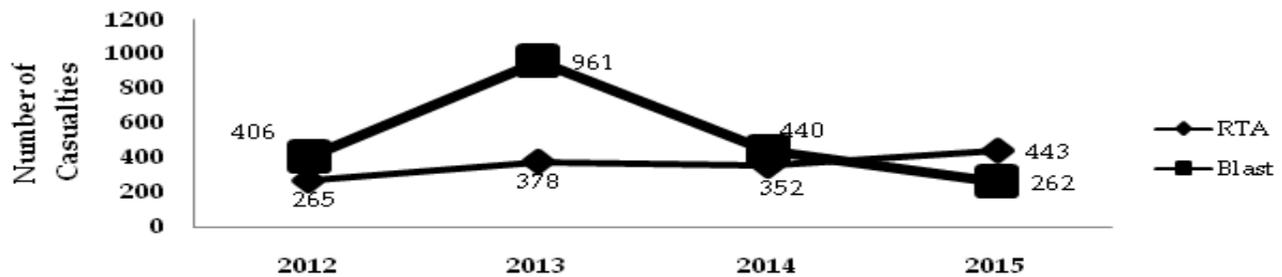


Figure: Year wise break down of number of casualties due to different mass casualty events.

the contingencies. Such plans must be based upon the local data followed by their re-evaluation. The aim of this study was to undertake clinical audit of mass casualty management at CMH QTA, from 2012 to 2015 and to carry out a review of the measures being taken and those required for the enhancement of capabilities to handle major mass casualty events.

PATIENTS AND METHODS

This descriptive study was carried out in CMH QTA from January 2012 to December 2015. The consent to carry out the study was taken

management of mass casualties. Disaster response preparedness criteria developed by Joint Commission on Accreditation of Healthcare Organizations (JCAHO) including six critical areas like communication, supplies, security, staff, utilities and clinical activity were employed to evaluate disaster preparedness¹². Based upon the analysis minimum requirements were laid down to enhance the capability of CMH QTA for managing mass casualty events. Statistical Package for the Social Sciences (SPSS)-19 was used for data analysis. Descriptive statistics were employed. Frequency and percentages were

calculated for the types of casualties, brought in dead, admitted casualties, types of procedures carried out and the deaths.

RESULTS

A total of 3507 casualties were received during the study period in CMH QTA in various mass casualty events. The highest percentage of casualties was received in 2013 (42%, n=1459), followed by 21% (n=751) in 2014, 19% (n=661) in 2015 and 18% (n=636) in 2012 (fig). Fifty nine percent (n=2069) of casualties received in CMH QTA resulted from bomb blasts, IEDs and gun-shot wounds while 41% (n=1438) resulted from road traffic accidents. The year-wise distribution of casualties revealed that highest number of blasts and gun-shot wound injuries occurred in 2013 while of road traffic accidents occurred in

patients, the highest percentage (89%) of the patients underwent minor procedures like debridement, stitching and aseptic dressing followed by laparotomy (3%) and open reduction internal fixation (2.6%) (table-I). Twenty five percent of the admitted patients were managed by a team of surgeons belonging to different specialties.

Review of the preparedness for mass casualty management at CMH QTA, revealed that five steps i.e. motivation, enhancement of training, mass casualty management drills, enhancement of resources and quality management have been adopted. The first step was motivation of all the staff members especially inculcation of soft skills through lectures and supervision. Enhancement of training of our available staff was our second step. This was

Table-I: Types of procedures carried out on admitted patients.

Surgeon	Procedure	Number	Remarks
Orthopedic surgeon	External Fixation with POP	18	In about 25% of these procedures required a team work of at least 2-3 surgical specialties.
	Open Reduction Internal Fixation	63	
	Amputations	14	
General Surgeon	Debridement, ASD, Stitching	2105	
	Exploratory Laparotomy	71	
	Vascular repairs	24	
Thoracic surgeon	Chest tube intubation, Thoracotomy removal of Foreign Body	51	
Neurosurgeon	Craniotomy (Removal of Foreign Body from scalp bones, haematomas , Neck exploration	32	

2015 (fig). Civilian casualties (79%, n=2761) outnumbered those of the army personnel (13%, n=463) and frontier corps (8%, n=283). The primary care, clinical and mortality audit revealed that 91% (n=3192) were injured but alive while 9% (n=315) were brought in dead. Out of the total injured but alive, 25.5% (n=814) were managed as outpatients and 74.5% (n=2378) were admitted. The hospital stay of 75% of the admitted patients was less than 7 days while of 25% was more than 7 days. Forty two (1.8%) died after admission. Out of the total admitted

being achieved by biannual CBRNe (Chemical, Biological, Radiological and Nuclear warfare) courses, quarterly ATLS (Advanced Trauma Life Support), PTC (Primary Trauma Care), BLS (Basic Life Support), monthly mortality and morbidity reviews, weekly clinico-pathological conferences (CPCs) and various lectures by guest speakers. Regular mass casualty drills involving the doctors of various specialties and the paramedical staff had been third step. These drills were carried out monthly followed by audit of the observed lapses for improvement at each

level. Despite our continuous efforts for resource enhancement with the landmark achievements of establishment of burn unit and emergency medical service in QTA Cantonment, the high incidence of mass casualty events in Quetta with subsequent burden on CMH QTA demands enhancement of finance, equipment, buildings and human resource. Finally, quality management and clinical governance are essential for the efficacy and sustainability of the system which were ensured by daily hospital round by Commandant, feedback proformas, head of departments conferences, mortality/morbidity reviews, complaints/ compliments received and monitoring quality of care against demonstrated performance through inspector general Hospitals clinical audit guidelines. The evaluation of disaster response based upon Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards revealed that 4 out of 6 tested areas were adequate (table-II).

DISCUSSION

The developed world can bear the effects of disasters easily because of strong economies and well- developed systems however the progressing countries suffer from disasters badly

possible by triage⁵. Two studies revealed that approximately 42% of the nurses and house officers had no idea of the triage and disaster management plan of their hospital highlighting the need of training them for mass casualty management^{3,6,13}. Guerdan et al recommend enhancement of the human resource by specific training to the primary physicians, under graduate and post graduate students for all forms of disasters^{1,14}. The motivated medical responders may lead to risk reduction¹⁵. We agree with Zhong and Siddiqui et al. that an effective emergency response team for pre-hospital care is essential to save many valuable lives^{7,13}. Availability of miniature, portable equipment for on spot triage may help improve patient outcome by early diagnosis⁷.

According to JCAHO, every hospital should conduct mass casualty drill at least twice a year. Mehta S, in his editorial also believe that the mass casualty drills must be conducted regularly followed by the audit of the deficiencies in terms of manpower, equipment, coordination, triage, medicine and the security in order to improve the preparedness⁵. Keeping these guidelines in mind, the mass casualty management drills are being

Table-II: Evaluation of disaster response at CMH Quetta from 2012-2015, based upon JCAHO standards¹².

S. No.	Features	Adequate	Inadequate
1.	Communication with Law enforcement agencies & other Hospitals	Yes	-
2.	Supplies (Self sufficiency)	-	Yes (Only 08 Operation Theatres, limited stretchers & wheel chairs)
3.	Security (Staff & Patients)	Yes	
4.	Staff (Sufficiently Available)	-	Yes (Vascular surgeon not available, Only 2 surgery residents & 4 house officers for the whole hospital available)
5.	Utilities (Availability for at least 96 hrs)	Yes	-
6.	Clinical Activity (Routine services unhindered)	Yes	-

in the form of disruption of the routine system apart from the effects of the disaster itself³. In disaster situations, instead of saving all the lives, the objective shifts to saving as many lives as

carried out at CMH QTA on monthly basis.

Many guidelines for disaster management arose after challenges faced like establishment of isolation facilities and infectious disease

surveillance system in China after SARS epidemic⁷. Similarly, the disaster management approach of Israel involved the employment of people from all walks of life¹. Such an involvement of people not only shares the burden and improves outcome but also inculcates a sense of responsibility among society. For coordinated response, a central command and control system for disaster management must be in place locally as well as at national level (like NHEPRN, National Health Emergency Preparedness and Response Network)⁶. The information desk set up is also essential to reduce unnecessary overcrowding⁶. At CMH Quetta, the local security and the information desk set up, during disaster situations, is maintained with the help of sister units. Such support helps reduce panic, prevents further damage and ensures smooth working of staff.

Majority of the casualties in our set up were civilians many of them being poor and mostly the identity was not clear. Financial constraint was another limitation. A study by Bajao et al recommend allocation of a reserved fund for disaster situations along with development of effective networking between the hospitals in terms of human resource, equipment and blood bank services¹⁰.

After the acute management of casualties, psychological support is also an essential component of management of the casualties and their relatives⁷. The casualties and their relatives need psychological support in acute phase in order to reduce the shock effects and later on for enhancing their depression coping skills⁷. The psychological follow up of the casualties and improvement of soft skills of nursing staff needs more improvement in our set up which can be improved through formal and informal interpersonal communication skills workshops. The psychologist being an important member of disaster management team at CMH QTA plays an active role in this regard.

An active blood bank with a directory of potential healthy donors and an active infection

control committee had also been our strength at CMH QTA. Enhancement of resources can be done by training the staff for cross-disciplinary assistance of clinicians in disaster situations¹⁶. Moreover the non-emergency surgeries could be postponed in favor of emergency surgeries¹⁶.

It is imperative for the hospitals to remain prepared for all sorts of disasters⁹. Availability of written guidelines, training of staff, mock exercises, evaluation of preparedness of staff, hospital evacuation plan, involvement of community, command and surveillance system is also essential^{3,10}. Cooperation with local emergency medical services and a referral system is also important in order to distribute the hospital load for effective management of casualties¹⁰. Our study revealed a mortality rate of 1.8% of the total admitted patients which is lower than the finding in a previous study conducted in our institute in 2004, on mass casualty event which showed a mortality rate of 4% out of a total of 141 admitted patients¹⁷. The reduced mortality rate in our set up is a reflection of the improvement in the preparedness for mass casualty management. The same study revealed an expenditure of Rs. 3.6 million on non-entitled casualties in a single mass casualty event occurring in March 2004¹⁷.

Based upon the findings, establishment of Emergency Medical Service like 1122 comprising trained paramedical staff for receiving, first aid management and further transport of casualties to the concerned hospital is recommended for the Quetta city and surroundings. Moreover establishing a revolving fund with government of Balochistan at Corps level may help in the early settlement of financial issues of the civilian, non-entitled patients. This successfully implemented model at CMH QTA and our recommendations may become the backbone for developing national level guidelines for effective mass casualty management.

CONCLUSION

The existing resources are sufficient for managing minor and moderate mass casualty

scenarios but proper planning and enhancement of resources (equipment, infrastructure and personnel) is essential to cope with any probable major mass casualty event. We recommend proper training of paramedical staff for receiving, triage, resuscitation and definitive management of casualties.

Disclosure

The data of this article was presented in Surgeon General's International Conference (SGIC) 2016, by the authors.

CONFLICT OF INTEREST

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

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