

EXERCISE AZM-E-NAU-3, THE LABORATORY PERSPECTIVE

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ABSTRACT

Objective: To describe the adequacy of laboratory equipment and human resource for dealing one thousand war wounded casualties.

Study Design: A descriptive study.

Place and Duration of Study: Combined Military Hospital Bahawalpur, from 10th April to 19th April 2010.

Material and Methods: Two teams each headed by a qualified pathologist worked round the clock in twelve hour shift dealing with the samples of war wounded (WW) casualties along with routine indoor /outdoor workload. Receipt of samples, analysis, reporting, record keeping, blood donation and transfusion were according to the protocol following turn around time (TAT).

Results: A total of 5487 analyses were done in a period of ten days. All range of investigations were requested but blood complete picture (CP) constituted the maximum (33.9%) followed by hepatitis screening (22.7%) and biochemical profiles (17%). Other investigations were in connection with the preparation of the patients for surgery. A total of 101 pints of blood were issued during the course of exercise, with maximum on the 16th April 2010 constituting 20.7% of total. Maximum number of pints of blood issued to any single WW casualty was five amounting to 4.9% of the total.

Conclusion: CMH Bahawalpur pathology laboratory successfully managed the load of 1000 WW casualties by providing prompt laboratory support for treatment, by timely delivery of requisite results of investigations and blood transfusion.

Keywords: Exercise Azm-e-Nau-3, Military hospital exercises, Military medical exercises.

INTRODUCTION

Military exercises are carried out round the world to assess and evaluate own resources, for enhancement in level of preparedness and improvement of existing policies and procedures for delivering optimally in the hour of need. A military exercise (also called war game in American English) is the employment of military resources in training for military operations either exploring the effects of warfare or testing strategies without actual combat¹. Military medical exercise may be an independent endeavor or part of military exercise, generally carried out as joint medical exercises for medical readiness and training (MEDRETE)² purposes or joint aero medical evacuation for rapid treatment of acutely injured to decrease mortality³.

Exercise Azm-e-Nau-3 which translates as "New Resolve" was a six weeks field exercise (war game) in southern Punjab involved more than 50,000 troops belonging to all arms and services, besides engagement of various equipment and aircraft of the Pakistan Air Force. It was both warning and show of confidence to the world that nation is capable to defend its homeland whether eastern or western borders⁴.

Medical support plan for casualty handling and evacuation was prepared at Corps Head Quarter Bahawalpur by Director Medical Services, incorporating forward treatment centers (FTC) and field medical units. Combined military hospital (CMH) Bahawalpur was designated as the base hospital to receive casualties of all types and nature.

Combined Military Hospital (CMH) Bahawalpur, a tertiary care hospital, prepared comprehensive casualty management program which was enforced on the day of commencement of exercise with which the

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hospital immediately went on twelve hours shift, ready to receive (mock, simulated) casualties. Each shift in the laboratory had physical presence of pathologist with team of dedicated laboratory technicians. The aim of the study was to find out and highlight the level of preparedness in terms of electro medical equipment and human resource adequacy for dealing one thousand war wounded casualties. This analysis may help reviewing the current medical support plan for casualty handling and evacuation to this hospital for the future planning.

MATERIALS AND METHODS

The descriptive study was carried out in CMH Bahawalpur from 10th April to 19th April 2010. Two teams each headed by a pathologist worked round the clock in twelve hours shift, not only dealing with WW casualties but also performed the routine analysis for indoor and outdoor workload. Protocol for receipt of samples, analysis and reporting was followed. Mock samples; either sample containers labelled with ww casualty number or request form mentioning WW casualty number were sent to the laboratory for investigation or issue of blood from operation theatre, ITC or surgical ward.

Human resource included two pathologists, ten laboratory technicians and one sanitary worker. CMH Bahawalpur pathology laboratory was equipped to carry out all the routine investigations and provision of safe blood transfusion required for 1000 WW casualties. Electro medical equipment included semi automated chemistry analyzers, haematology analyzer, blood bank (500 pints holding capacity), microscopes, centrifuges, autoclaves, incubators, water baths and micropipettes. Sufficient quantity of reagents and kits were available to meet the requirement of 1000 WW casualties.

Patient ID was designated by the alphabets WW with a numerical figure denoting the specific patient like WW 121. This ID was suffixed with the day of the attack (battle) D (-1) meant the day before the attack, D (Day) the day of attack and D (+1) a day after the attack etc. WW 121 D (+1).

This ID was followed for all investigations, reports and medical record. Data collection in the form of work lists for analysis were prepared according to the same ID and the results were reported and recorded as hard copy in the laboratory registers. Special emphasis was given to TAT of each test by adopting following procedure.

On receipt of request form of WW casualty for a particular test the request form was endorsed with the time of receipt in laboratory and one sample obtained from the previous day's available sample (which was to be discarded) was given this ID so that actual analysis could be performed simulating the real time scenario so as to ascertain the time from receipt to result as done for real patient. All analysis carried out in the laboratory for ww casualties were recorded in the registers specially made for exercise Azme-e-Nau-3 so that this could be referred to for post exercise data analysis. Brought in dead were marked with tag "dead" and kept in the mortuary. They were handed over to the NOK (next of kin) after proper documentation between wardmaster and the laboratory staff.

Blood is an important commodity; its provision in ample quantity during the war needs to be planned during the peace time. All the blood transfused during the exercise period was shown (on papers) to be received from civil population on voluntary basis through blood bank services of BVH (Bahawal Victoria Hospital) and from prisoners of jail by prior liaison between CMH, medical superintendent of BVH and superintendent jail Bahawalpur.

Strict protocol was adopted for issuance of blood to the ww casualties. On receipt of blood issue proforma the status of requirement was assessed, whether un-crossmatched (required immediately) or for surgery after completion of laboratory investigations. Blood group O negative was issued immediately on priority for un-crossmatched demands. For other cross match and issue proforma, one sample obtained from the previous day was given the ID mentioned on

the request form for issue of blood and time of receipt in the laboratory. Blood grouping was done, cross match was put up and compatibility was verified by the pathologist, subsequently issuing the blood in an hour's time. Data was analyzed using microsoft excel. Descriptive statistics were used to describe the results.

RESULTS

A total of 5487 analyses were done in pathology laboratory over a period of 10 days with effect from 10th April to 19th April 2010. Maximum number of analysis was done on the 10th April 2010 which included screening of blood (hepatitis, VDRL and HIV) for transfusion, which were 14.5% of the total investigations carried out in this period. All range of investigations were requested during the period of exercise but blood CP (complete picture) constituted the maximum i.e, 33.9% of the total investigations carried out, followed by hepatitis screening: 22.7% and chemistry profiles: 17%. Least requested investigation was stool R/E (routine examination) i.e, 0.02%. Other investigations like BT/CT (bleeding time/clotting time) 0.05%, haemoglobin estimation: 1.8%, blood grouping: 5.7%, VDRL: 3.6% and HIV: 3.6% were requested

of total pints of blood issued (Table-2). Maximum

Table-1: Work load of pathology laboratory (n = 5487).

Parameter	Total Investigations (n)	Percentage (%)
Blood CP	1859	33.9
BT/CT	03	0.05
Hb %	98	1.8
Blood grouping	312	5.7
X-match	271	4.9
Chemistry	934	17
Hepatitis screening	1248	22.7
Widal	06	0.1
Urine R/E	351	6.4
Stool R/E	01	0.02
Stool occult blood	02	0.04
Urine culture	02	0.04
VDRL	200	3.6
HIV	200	3.6

number of pints of blood issued to single ww casualty was 05 units amounting to 4.9% (Figure-1).

There were 72 brought in dead who were

Table-2: Frequency of work load and issue of blood according to days.

Days	No of investigations (n=5487)		Pints of blood issued (n=101)	
	Total	Frequency (%)	Total	Frequency (%)
10 th April	800	14.5	-	-
11 th April	119	2.2	01	0.9
12 th April	427	7.8	11	10.9
13 th April	645	11.7	14	13.9
14 th April	481	8.8	15	14.8
15 th April	739	13.5	14	13.9
16 th April	772	14	21	20.7
17 th April	604	11	11	10.9
18 th April	563	10.3	11	10.9
19 th April	337	6.1	03	2.9

in connection with the preparation of patients for surgery (Table -1).

A total of 101 pints of blood were issued to WW casualties. Frequency of issue was maximum on 16th April 2010 amounting to 20.7%

dealt with by laboratory and wardmaster staff (Figure-2).

DISCUSSION

Military exercises in general and military medical exercises in particular are conducted all

over the globe to enhance preparedness and readiness⁵. Military medical exercises incorporate mock drills by giving calls to activate emergency preparedness plan for putting all departments on the alert and setting up triage and treatment stations. To make the scenario more realistic, simulated casualties use various props, fake blood and plastic wounds⁶.

SIMMAN 3-G an advanced simulated patient is in use in military medical exercises that responds automatically to intubation, drug administration and other treatments. It has an air compressor to simulate breathing and fluids to simulate bleeding and sweating. The eye lids blink and pupils react to light⁷.

Evacuation of casualties / patients is given due importance during these exercises especially aero evacuation in the form of joint aero-medical evacuation for rapid treatment of acutely injured to decrease mortality³. Emergency medical treatment area (EMT) carrying the same equipment as in civilian emergency room has been designed possessing air-drop capabilities where required⁸.

Largest peace time medical exercise in US Navy history involved 618 simulated casualties treated on the trauma hospital ship USNS "Mercy" in which 1470 medical personnel participated. The mission was to provide acute medical and surgical care in support of US troops in hostile areas anywhere in the world⁹.

Exercise Azm-e-Nau-3 was the largest ever field exercise on the eastern border as part of efforts for preparedness to face new challenges. In this exercise simulated patients were treated representing battle field trauma, disease, non-battle injuries and combat stress casualties which would have not been possible without fully equipped laboratory and its trained staff.

Soon after the casualties were received in emergency reception area, the information was disseminated on public address system to all wards and departments of the hospital. After triage, simulated patients/casualties were assigned identification numbers e.g., WW-121

(D+1) which were followed throughout the stay in the hospital. Handling of dead, their documentation and disposal was also the part of this exercise.

Pathology laboratory also received lab request forms / simulated samples / requests for blood endorsed with these ID numbers. All the samples of WW casualties / patients were analyzed according to priority without hampering the routine laboratory work.

British medics and para-medics also carried out exercises in similar manner by going through series of realistic scenarios for treating the casualties, surgeons conducting operations and laboratories sorting out blood for transfusion¹⁰.

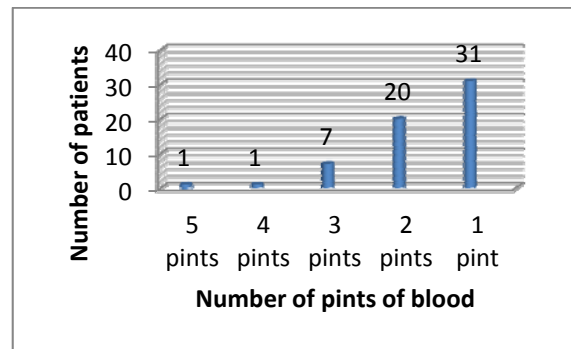


Figure-1: Number of pints of blood issued to the war wounded casualties (n=101).

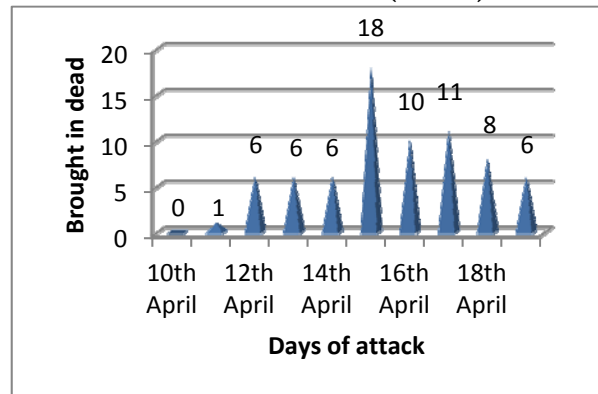


Figure-2: Distribution of brought in dead to the hospital (n=72).

CMH Bahawalpur pathology laboratory was fully equipped to deal with one thousand casualties/patients. Pathology laboratory carried out the analysis, blood screening, and blood

cross-match so as to polish the skills and keep the laboratory team sharp to respond to any emergency situation because the main workload during the period of exercise was trauma related requiring blood transfusion. Workload pertaining to screening was in connection with blood donor screening and pre-operative workup for the surgeries.

China's People's Liberation Army (PLA) carried out exercise "Mission Action 2010" engaging 30000 troops in simulated confrontations with more practical significance comprehensively assessing medical support, POL supply and war indemnity. Military hospitals near the exercise area were given the responsibilities for medical support, at the same time the hospitals subordinated to each division were to provide accompanied support¹¹. In exercise AN-3, CMH Bahawalpur a tertiary care hospital was designated as the base hospital to receive all types of casualties / patients from the exercise area. After the receipt of casualties / patients, proper documentation was done and whatever treatment was required after laboratory investigations and radiological examinations was instituted and recorded in the medical charts.

These mock drills on simulated patients did make a difference, weak areas were identified and deficiencies were made up. Procurement of automated equipment is underway which would further improve the efficacy. Field medical units and base hospitals must carry out regular mass casualty management exercises (mock exercises with simulated patients) for enhancing the level of preparedness and readiness of medics and para-medics to deal with the future challenges in befitting and professional manner. This is an

international norm and is conducted by nations as MEDRETEs (Medical Readiness Training Exercises)² and STX (Situational Training Exercises)¹².

CONCLUSION

CMH Bahawalpur pathology laboratory successfully managed the load of 1000 WW casualties by providing prompt laboratory support for treatment, by timely delivery of requisite results of investigations and blood transfusion adopting twelve hour shift.

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