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Hospital Administration

ASSESSMENT OF DISASTER PREPAREDNESS BY CONDUCTING A MOCK DRILL IN A TERTIARY CARE TEACHING, RESEARCH AND REFERRAL MEDICAL INSTITUTE IN SOUTH INDIA

K. Vamsi Krishna Reddy — Senior Resident, Department of Hospital Administration, All India Institute of Medical Sciences, New Delhi

Jonnala Sindhu* — Junior Resident, Department of Hospital Administration, Nizams Institute of Medical Sciences, Hyderabad *Corresponding Author

N. Lakshmi Bhaskar — Associate Professor, Department of Hospital Administration, Nizams Institute of Medical Sciences,Hyderabad

ABSTRACT

Background: Disaster management occupies an important place in this country's policy framework as it is the poor and the under-privileged who are worst affected on account of calamities /disasters. Disasters and mass casualties can cause great confusion and inefficiency in the hospitals. Hospital disaster drills provides the opportunity to plan, prepare and when needed enables a rational response in case of disasters/ mass casualty incidents.

Method: A mock drill was conducted to assess disaster preparedness of the hospital on 15th Sep 2015. Mock drill was done under the supervision of Department of Hospital Administration. The drill assessed the functioning of Emergency and other areas in the hospital during disaster situations. The assessment was done on the basis of a checklist/questionnaire developed from the "Tool for Evaluating Core Elements of Hospital Disaster Drills" prepared by The Johns Hopkins University Evidence based Practice Centre, Baltimore.

Results: Thus assessment of drills showed that the Incident Command System (ICS) and Treatment zone worked efficiently but the Restriction Zone and Triage Zones need to be strengthened and managed more efficiently.

Recommendations: There is need to conduct regular drills and their proper assessment with standardized tools should be done by appropriate authorities who are well trained beforehand. A tabletop exercise can help to motivate hospital staff to learn more about disaster preparedness and can help to teach staff about aspects of disaster-related patient care in a way that simulates the practice setting.

KEYWORDS : Disaster Preparedness, Mass Casualty Incident, Incident Command System, Restriction Zone, Triage Zone, Treatment Zone

BACKGROUND

Disasters in the communities come in all shapes and sizes. Some impact a small number of people and put intense demands on the health system for a short period. Others may involve a large number of casualties but reach a plateau only after a latent period, placing heavy continuing demands on the health system. Natural disasters like hurricanes, earthquake, tsunamis, floods and volcanoes, and man-made disasters like chemical plant explosions, industrial accidents, building collapses and acts of terrorism all point toward a growing threat of a Mass Casualty Incident (MCI), Preparing of MCI is a daunting task, as unique issues must be considered with each type of event. The Hospital disaster Preparedness has therefore taken on an increased importance at local, state and national levels[1.] when the resources of the hospitals (infrastructure, trained manpower and Organization) are over-whelmed beyond its normal capacity and additional contingency measures are required to control the event, the hospital can said to be a disaster situation.[2]

Not only there is an urgent need to increase the preparedness of hospitals in mass casualties, but also the hospitals have to expand their focus to include both internal hospital planning as well as be a part of the regional plan for disasters and mass casualties. Preparedness for disasters is a dynamic process. In addition to having a well-documented disaster management plan (DMP) in place, it is prudent to have regular drills to test the hospital's DMP. The drills may be hospitals disaster drills, computer simulations and tabletop or other exercises[3-5]. In India hospitals rarely have a documented DMP and even rarely conduct disaster drills or publish the reports of such drills. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) actually requires hospitals to test their emergency plan twice a year, including at least one community- wide drill.[3]

The purpose of the hospital disaster drill is to train hospital staff to respond to an MCI, to validate the readiness and effectiveness of the hospitals DMP to make new hospital staff to become aware of procedures in disaster response, to incorporate advancements in knowledge and technology into the DMP and use the reports from the drill to reinforce the DMP. Hospital disaster drills should test various components viz. incident command, communications, triage, patient flow, drugs and consumables stock, reporting, security and other issues[6-8]. This study aims to assess the disaster preparedness of the hospital by conducting a mock drill at Nizams Institute of Medical Sciences, a tertiary care teaching, research and referral medical institute in a South Indian city, Hyderabad.

METHOLODOLGY

A mock drill was conducted to assess disaster preparedness of the institute's hospital on 15th Sep 2015. Mock drill was done under the supervision of Department of Hospital Administration. The drill assessed the functioning of Emergency and other areas in the hospital during disaster situations. Before mock drill, questionnaire was filled up by the observer in which type of drill, type of agency giving information needed for commencement of drill, areas to be monitored during the drill etc. were registered and thereafter drill assessment tool developed from the "Tool for evaluating core Elements of Hospital Disaster Drills" prepared by The Johns Hopkins University Evidence-based Practice Centre, Baltimore was used to evaluate the drill.

The assessment was done on the basis of a checklist/questionnaire viz. Incident Command System (ICS)/Incident Command Zone i.e. the controlling authority of the incident disaster, Triage Zone, Restriction Zone and Treatment Zone. The checklist/questionnaire was developed from the "Tool for Evaluating Core Elements of Hospital Disaster Drills" prepared by The Johns Hopkins University Evidence based Practice Centre, Baltimore.

The **Incident Command System (ICS**) was either in the Department of Hospital Administration or in emergency itself. In the situation of any crisis, either duty Resident Hospital Administrator or the office of medical superintendent was the place where the information regarding disaster was first received and measures to manage any sort of crisis situation were planned and activate the disaster plan.

The **Restriction Zone** was created at from entrance of Emergency till O.P card issue counter side where security guards were posted who checked the entry of visitors and restricted unwanted people in the area.

The **Triage Zone** was created area after the Restricted Zone where the victims were categorized according to the severity of the injuries and possibility of outcome. It was the area outside the Emergency Medical officer room and the observation area which was designated as Triage Area.

Lastly, **Treatment Zone** was created in the Surgery Emergency (S.I.C.U), as this area is well equipped with all sorts of life saving machines and drugs in the form of disaster kit. A well experienced team of doctors including Faculty of Department of Surgery, Orthopaedics & Medicine Senior Residents along with Junior Residents and other Health Care Workers were posted there.

The drills assessed not only the functioning of Emergency area of the hospital but also other important factors which play important role for implementing disaster plan effectively i.e., communication both internal and external, security arrangements, effective media & public control etc.

RESULTS:

The mock drill was done on 15.09.2015. It started after a call was received from the police control Room to duty Hospital Administrator and subsequently to Medical superintendent. An ambulance was rushed along with team for disaster to site of building collapse. Till this mock drill, as such there was no disaster plan on papers and in practice therefore although the ambulance and the medical team reached the venue well in time but the preparation of the staff in the emergency was not up to the mark. This drill was assessed by the assistant Nursing superintendent and the Senior Resident of Hospital Administration. In drill it was observed that disaster control room was established and received timely updates from the disaster site but no disaster management plan was there due to which no co-ordination of activities was found in restriction zone, triage zone and treatment zone. This drill included Pre-disaster briefing, disaster phase and post disaster briefing.

Pre-disaster briefing: Healthcare workers of the hospital were briefed about the drill and their job actions during the drill. To make all the staff aware of the mock drill a meeting was held a day before the drill under the chairmanship of Deputy Medical superintendent and conveyed the same through group messages and official mails. A brief disaster management plan was made in terms of a flow diagram so as to handle the external disaster scenario as there is no disaster management plan in NIMS. The hospital emergency was also prepared for adequate equipment and inventories.

Disaster phase: An apartment building collapse scene was created in Punjagutta area which is in the vicinity of NIMS. The incident command system was created in the duty Hospital administration resident control room.

External Disaster Response: As soon as the information is received by duty resident, ambulance started from the hospital to disasters venue. The emergency department is declared as disaster control zone. Here the Deputy Medical Superintendent took charge of the emergency area. The area was restricted and cleared off the visitors and stable patients were shifted to nearby wards. The Triage zone and the treatment zone were created in surgery cum orthopedic I.C.U. In charge emergency and nursing superintendent took charge of treatment zone and triage zone respectively. A total of 20 volunteers who acted as victims were brought in the hospital by five ambulances as a part of drill from the above location. These victims admitted in emergency directly without any delay.

During this drill all the following zones were assessed for the disaster response :

TAB 1: DRILL OBSERVATION; INCIDENT COMMAND SYSTEM

S.No	Points evaluated	Mock Drill
1.	Did drill start on time?	No
2.	Time taken by in charge to take command?	20-30 min
3.	Time taken to activate disaster plan?	Not Activated
4.	Was disaster control room established?	No
5.	Location of disaster control room	-
6.	Was disaster plan followed?	No
7.	Was staff updated?	Yes

The incident command zone has been defined as a zone where the information about disaster is first received and then after confirmation, the authorities activate disaster plan accordingly and take control of all the activities and instructions. The observations regarding the incident command zone are depicted in Table No. 1 above.

In NIMS till mock drill, there was no designated control room or command room for disaster management in case any disaster occurs. Thereafter it was decided that in future either the Medical superintendent/Deputy Medical superintendent will take charge of the situation and ICS and will instruct the concerned officials accordingly. Also their respective offices will act as disaster control room or incident command zone. So it was analyzed that while conducting the drill, the drill was neither started on time nor the disaster plan was followed. The time taken by in charge to take command of the ICS was 20-30 minutes. Also as there was no documented disaster plan till mock drill, but for the sake of drill a flow diagram of the course of action and job responsibilities were identified. The time taken to initiate the disaster plan in the form of the job responsibilities ranged from 20 to 30 minutes. The Disaster control room was established in duty Hospital administration resident room in the emergency building. Also the staff was kept updated regarding the drill activities and also the scenario outside the hospital. The staff included Medical superintendent, Deputy Medical Superintendent, Senior Resident and Junior Residents of the department of hospital administration.

TAB 2: DRILL OBSERVATION; RESTRICTION ZONE ANALYSIS

S.No	Points evaluated	MockDrill
1.	Were boundaries well defined	Yes
2.	Did in charge took command?	Yes
3.	Time taken to take charge ?	20 – 30 min
4.	Was the zone setup well in advance ?	No
5.	Victim documentation was done ?	No
6.	Was security efficient ?	No
7.	Was disaster plan available to staff ?	Yes

The Restriction Zone is a zone where disaster victims are received, triaged and treated hence flow of other routine patients and their attendants cum visitors cum visitors is restricted. This zone should be set up as soon as the information regarding disaster is confirmed and the in charge should ensure deployment of appropriate number of security personals so as to check limited entry of visitors and also quick mobilization of excess of patients who are stable to the other areas.

Table No 2 illustrates observations related to Restriction Zone. It was created in Emergency beside information counter area and its boundaries are well defined and guarded by security personnel. The in charge of Restriction Zone was Emergency Medical Officer. Time taken to take charge of the area was about 20 – 30 minutes. The security was found to be deficient in number. Though Victims were received, victim documentation was not done by Emergency Medical Officer (EMO) in the restriction zone on a separate disaster documentation sheet. The staff in the restriction zone included EMO, Fessey workers (Hospital Attendants), Information counter Personals and security guards. The staff in the restriction zone was not aware of the disaster plan however they were given verbal instructions regarding their job actions therefore security was found to be inefficient.

TAB 3: DRILL OBSERVATION; TRIAGE ZONE ANALYSIS

S.No	Points evaluated	Mock Drill
1.	Were boundaries well defined	Yes
2.	Did in charge took command?	Yes, Anaesthetist
3.	Time taken to take charge ?	-
4.	Was the zone setup well in advance?	No
5.	Was colour coding done?	No
6.	Was space allotted sufficient?	No
7.	Was supply of medicines & equipment adequate?	Yes

Triage zone has been defined as an area where the victims will be classified on basis of their severity of injuries into moribund (Black), requiring immediate treatment (Red), or those who are stable (Green) and those who can wait (Yellow). This area should be commanded by an Anaesthetist or a Medical faculty. The victims from this area should be shifted to the treatment zone with proper and clearly visible triage labelling.

Table No 3 illustrates observations related to Triage Zone. The triage area was created in the Observation area where along with triaging minor treatment for stable patients was done. It was found that triage area was developed and taken command by the Assistant Nursing

Superintendent and Faculty from Department of Anaesthesia. The triage team included Faculty, Senior Resident and Junior Residents of Anaesthesia Department. Although the space allocated for triaging found to be deficient where other routine patients were also present the area functioned efficiently because of sufficient supply of medicines and consumables required to treat minor injuries. The victims were triaged and given treatment accordingly in the treatment zone but were not given any colour coded labels.

TAB 4: DRILL OBSERVATION; TREATMENT ZONE ANALYSIS

S.No	Points evaluated	Mock Drill
1.	Were boundaries well defined	Yes
2.	Did in charge take command?	Yes
3.	Time taken to take charge?	10-15 min
4.	Was staffing sufficient in this zone?	No
5.	Was disaster plan available to staff?	No
6.	Did zone function efficiently?	Yes
7.	Were updates regarding victims and situation outside hospital available?	Yes
8.	Optimum security control in the zone?	No
9.	Were supplies and equipment's adequate?	Yes

The Treatment Zone is the area where victims are actually treated according to their triage labels. During the drill, it was created in the Surgical ICU. Table No.4 shows that boundaries of this area were well defined. The In charge was Clinical In charge of Emergency assisted by sister in charge of emergency. Time taken to take charge of the area was 10-15 minutes. It was observed that the staffing was insufficient in the area. They were kept updated regarding the situations inside as well as outside the hospital. There was sufficient supply of disaster inventory (medicines and equipment). Also security control in this zone was found to be inadequate.

Thus assessment of drills showed that the ICS and Treatment zone worked efficiently but the Restriction Zone and Triage Zones need to be strengthened and managed more efficiently. Time taken to take charge of the zones should be reduced. After assessment of the mock drill it was found that there was lack of awareness and also co-ordination among the staff regarding their job and responsibilities during disaster. Disaster management strategy/policy (DMP) to the hospital is not available, Hence it is felt that it needs to be prepared and circulated to the staff and should be updated and instructed regarding their job actions during a disaster and disaster drill. The staffing and space for Triage Zone and Treatment Zone was found to be insufficient also the victim documentation and triage policy was not followed in standard manner. It is also felt that after preparation of DMP, regular meetings should be undertaken by the Medical superintendent (MS) to appraise & sensitise various cadres of staff about it and improve the disaster management activities.

In the present study, overall functioning of ICS and treatment zones as analyzed by the help of AHRQ tool was found to be efficient but restriction zone and triage zone were deficient in terms of time taken to create and take command of these areas. It was found that the ICS and restriction zone are set up at the earliest but their staffing needs to be improved. Similarly the triage zone and treatment zone lacked the required number of skilled Staff and also adequate space.

In this mock drill, it was found that there is sufficient manpower, stock & inventory for handling any disaster but their awareness and alertness is not at par. Also there is no well documented disaster plan for the hospital. The inventory and manpower in emergency was found to be adequate and as per the guidelines laid down by Government of India in Guidelines for Hospital Emergency Preparedness, Planning and National Institute of Health and Family Welfare (NIHFW). Although the posts for Auxiliary Nurse midwife (ANM's), Lady Health Visitors, Health supervisors, Health Inspectors and Health workers as prescribed by NIHFW are not functional in the emergency at present. While rest of the staff personnel required in the emergency are sufficient in number. Also it was found that fully trained and designed teams for Triage and Immediate Resuscitation are not functional during drill and there is need to develop Inter departmental co-ordination for the same.

Recommendations:

Practice is crucial to prepare for emergencies. Health organizations may have preparedness and contingency plans yet only when these plans are put to a test through drills can managers determine gaps and areas that needed strengthening. Hospital drills are one of the best ways to test emergency plans, an effective way to improve clinician's knowledge about hospital disaster procedures and are an essential component to ensure that health professionals are prepared to face emergencies and disasters.

There is need to conduct regular drills and their proper assessment with standardized tools should be done by appropriate authorities who are well trained beforehand. Accurate phone numbers of key players were vital and regular updating of the same at Telephone Exchange is necessary. computer simulation may be an economical method to educate key hospital decision makers and improve hospital disaster preparedness before implementation of a full-scale drill; a tabletop exercise can help to motivate hospital staff to learn more about disaster preparedness and can help to teach staff about aspects of disaster-related patient care in a way that simulates the practice setting; a regional exercise involving top government officials can help to increase awareness of the need for better disaster response planning; and video demonstrations may be an inexpensive, convenient way to educate a large number of staff about disaster procedures and equipment use in a short time.

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