EVALUATING MEDICAL RESPONSE EXERCISE FOR MASS BURN INJURIES AT DISTRICT AND PROVINCIAL HOSPITAL

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SUMMARY

This study evaluated the medical response drill for mass burn injuries at district and provincial hospitals. The results showed that the medical facilities were properly implementing the steps in the process. Triage results were ensured 100% correct as a scenario. The diagnosis and treatment of burn injuries, proficiency in the use of equipment and transportation have achieved results of 80% or more.

Diagnosis of inhalation injury, diagnosis and treatment of co-trauma at district hospitals only reached 66.67% which should be improved. Through the lessons learned from the drills, handling future mass-burn injuries will be better for both victims and healthcare workers.

Keywords: *Fire disaster, mass-burn injuries, medical response*

1. INTRODUCTION

Mass burn injuries (MBI) often happen suddenly, in places with high fire and explosion risk such as industrial parks, factories, means of transport, supermarkets, restaurants, high-rise apartments with the number of accidents is large and exceeds the local health response capacity [1].

The planning and organization of rehearsals for first aid disaster victims at medical facilities play a great role in the preparation and proactive response to real situations when a disaster occurs. This study aimed to evaluate the results of medical response drills for MBI at district and provincial/regional hospitals based on the developed plan.

2. METHODS

2.1. Scenario

A wood factory caught fire and spread to combustible materials. Due to the rapid progression of the fire and limited escape system, 25 workers suffered burns, inhalation injury and combined injuries. Firefighters were dispatched to quickly extinguish the fire, searched and rescued victims from the fire. Security forces were deployed to protect and regulate traffic.

Emergency medical teams from local hospitals were dispatched to the scene, set

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up medical posts to receive victims from fire-fighters then conducted triage, first aid, initial management and transported to district and provincial hospitals.

At district hospital: 15 victims were given triage, stabilize the patient's conditions, management of burn shock and combined injuries, referral 9 severe patients to a provincial hospital.

At the provincial hospital: Arranged to receive 18 patients (9 patients from the field and 9 patients from district hospitals), conducted triage and provide basic treatment, transferring 7 severe patients to regional/central hospital.

Rehearsal location: District Hospital, Hanoi Department of Health and 105 Military Medical Hospital (considered as a provincial hospital).

2.2. Drill evaluation

- Evaluation team: 30 medical experts with experience in the fields of burns, disasters, emergency, intensive care and medical organizations.

- Evaluation method: In order to obtain objective results when conducting the assessment, the evaluator developed a checklist for the assigned assessment contents. Based on the criteria built in the checklist, the performance content of the participants in the drill was evaluated as satisfactory or unsatisfactory. The criteria that need to be quantified were calculated and recorded independently among the assessment teams. The assessment information was aggregated and analyzed.

- Evaluated criteria: The assessment content was the key points in the established procedures for medical response at district and provincial/regional institutes including [2]:

+ Information processing process, plan implementation

+ Mobilizing and allocating hospital resources

+ Patient flow coordination

+ Triage results: Time, precision level

+ Diagnosis, emergency and treatment techniques

+ Operation of the transfer team

+ Medical records, referrals

+ Drugs and medical equipment delivery

3. RESULTS

Table 1. An appropriate level of operation at heath facilities (n = 30)

Evaluation criteria	District hospital		Provincial hospital	
	n	%	n	%
Information management	27	90.0	30	100
Plan operation	30	100	30	100
Mobilizing resources	30	100	30	100
Patient flow operation	28	93.33	30	100

At the district hospital, information management was handled at 90% level, patient flow coordination including patient transfer between departments, ensuring the emergency reception areas for disaster patients met 93.33% of requirements. The implementation at the provincial hospital was carried out with 100% satisfaction according to the steps in the protocol.

Table 2. Triage results (n = 25)

Categorized content	Theorical		Reality		Maching (%)	
	District hospital	Provincial hospital	District hospital	Provincial hospital	District hospital	Provincial hospital
Red	0	9	0	9	100	100
Yellow	9	9	9	9	100	100
Green	7	0	7	0	100	100

Patient triage right after admission to the medical facilities was guaranteed to be 100% according to the scenario.

Table 3. Appropriate management level (n = 30)

Parameters	District hospital		Provincial hospital	
	n	%	n	%
Burn shock prevention and treatment	25	83.33	29	96.67
Trauma management	20	66.67	29	96.67
Burn extent diagnosis	25	83.33	27	90.0
Inhalation injury diagnosis	20	66.67	24	80.0
Burn wound management	25	83.33	24	80.0
Using medical devices	24	80.0	30	100
Referral profile	24	80.0	24	80.0
Evacuation team	24	80.0	27	90.0
Ambulance operation	27	90.0	27	90.0

Except for inhalation injury diagnosis and initial management of co-trauma at district hospitals reached only 66.67%, The diagnosis and treatment of burn injuries and co-trauma, the proficiency in the use of equipment, patients transportation and referral procedures all reached 80% or more.

4. DISCUSSION

The next stage immediately after planning for Mass casually incidence (MCI) is training and drills aimed at making medical staff familiar with the procedure, confident, and proficient in the steps involved in an actual emergency situation.

Over the years. The Vietnam Burn Association had actively built a network of burn treatment across the country and has also made connections between burn treatment facilities. The National burn hospital had organized drills of medical response to mass-burn incidence. However, the results of the actual investigation show that we still have a lot of work to do for improving the situation.

A survey conducted in 2016 showed that only 26.32% of medical facilities developed plans for MBI and only 36.84 hospitals arranged burn specialists in the mobile emergency medical team. In addition, there was only 21.05% of the medical facilities organizing a drill to respond to MCI (with burn patients). Most of the difficulties in implementing mass-burn response in health facilities were lack of resources, training courses (89.47%) [2].

The same situation was also seen in developed countries. Madge SN et al. (2004) investigated the ability of doctors at 11 hospitals in the Wessex region of England. The results showed that less than one-third of doctors had ever participated in handling mass casual incidents, only 11% had participated in a drill, and 45% of doctors felt confident in participating in the medical response to MCI [3].

Similarly, a survey by Wong K and colleagues in 2006 in the UK also showed that up to 47% of medical staff did not know about the hospital's medical response plan for MCI. Among those who read the medical response plan, only 57% were confident with their assigned position. There was 82% of hospitals conducted drills within 5 years, however, only 35% of hospitals would have a plan of drill in the next 12 months and 25% of hospitals had not implemented training on a medical response for MCI for doctors [4].

In 2015, McWillian T and colleagues identified the need and evaluated the effectiveness of training in first aid for burns for doctors outside the burn specialty, showing that most medical staff were not confident in their ability to practice first aid, triage and transporting burn victims, especially inhalation injury (only 29.2% experienced), large-scale burns (only 45.2%), treated deep burn wounds (47%) [5].

Continuing medical education and drills with near-real scenarios play a very important role in improving the quality of medical response to MCI. Schenker JD et al in 2006 evaluated the triage results according to the START procedure at the scene in a fire disaster drill showed that if the training was not repeated, the satisfactory rate was only 78% [6].

In Switzerland, in 2011, the first MBI exercise was conducted based on the medical response plan which had been built since 2010 and lessons learned had been applied for conducting the 2nd drill with the same scenario in 2012 showed a marked improvement in the command and control of triage, initial management and transportation from the scene to the hospital. specialized line reduced errors, overcome limitations of the first exercise [7].

Our results showed that through organizing the rehearsals of the processes and synthesizing the opinions of experts, the results are positive and relatively consistent. Appropriate resource arrangement was > 90%. Satisfactory triage according to the scenario, the contents of implementing medical response

such as respiratory resuscitation, circulatory resuscitation, burn treatment reached 83% or more. The district and provincial health levels had met the requirements and followed the steps in the process. Diagnosis and treatment of burn injuries, proficiency in the use of equipment and transportation activities achieved results from 80%. Some limitations have also been pointed out by experts, including the coordination between special forces in transport and emergency teams, resource allocation and coordination between medical teams.

5. CONCLUSION

The medical lines were deployed satisfactorily according to the steps in the plan. However, it is necessary to strengthen training and training in the diagnosis and treatment of inhalation injury, co-trauma for medical staff at district hospitals. Through the lessons learned from the drills, handling future MBI situations will be better for both victims and healthcare workers.

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