

The first Tornado in Nepal: March 2019

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ABSTRACT

On March 2019, first tornado was observed in Nepal. Bara and Parsa was two district that faced the disaster. As patient started to come into the hospital, we had shortage of medicine and space. We managed the surge of patient with triaging, first line treatment and referral of the critical patients. There were many crush and cut injuries and most of the critically ill patient had head injury and hypothermia.

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CASE REPORT

On 31 March 2019, during a rainstorm medical superintendent of Bara Hospital received an information from superintendent of police about the injuries. Medical superintendent took command and informed hospital staffs. The information was sent to doctors and nurses over group chat in social media and individual call to nursing in charge, paramedics in charge and medical officer in charge as well was done. Upon receiving information, the medical staffs arrived in emergency within 15 minutes.

Few injured patient and 5 dead bodies arrived in first group. Patient started to increase gradually and within first few hours, the 50-bed hospital was full with injured patients from nearby area like fracture shaft of femur and blunt trauma abdomen and head injury, chest injury with suspected pneumothorax were managed and again all staffs were called to hospital to manage this surge but few doctors were in Birgunj so they could not come due to disturbed road. There were eight critically sick patients requiring ventilator support, who were referred to a medical college. The hospital had only stock of medicine sufficient for about 25 patients only, so as it started getting short, Store In charge was ordered to maintain supplies. Emergency decision was made Medicines and supplies were bought from local shop that were outside hospital.

There was power cut off due to tornado, so we had to operate store and manage patient on backup light, however the backup light was not enough to run X ray machine. So could not do x-ray of chest injury but still was able to deal with the first surge, patients were managed within three hours. There were few patients coming in by the end of three hours.

On fourth hour, there was second surge of patient with more severe injuries. We received head injuries, out of which four were referred to the Birgunj hospital who had craniotomy; one elbow dislocation and one shoulder dislocation was reduced at the hospital. We also had a patient presented with airway obstruction due to "gutkha" (chewing tobacco), the patient was intubated to manage airway. There were several arterial and venous bleedings due to cut injury. We received 299 patients sutured 197 cut injuries overnight. Till morning we received 10 critically ill patients and 18 dead bodies however there were no hospital mortality. We managed to triage patients after second surge of patient.

After second surge of patient, the hospital was occupied more than its capacity. There were four to five patients in each bed in emergency. There were patients even on floor and chairs. The medical college and regional hospitals were also full so

asked only to refer critically ill patients. Crowd control was a problem, mostly due to visitors accompanying patients. We were asked by visitors to attend their patients first though not very sick. There was also huge pressure from visitors and some politicians to attend dead bodies first. Dead body were kept in red area by force which was later sent to black area later after counseling visitors.

After overnight work by all staffs, patients were cleared by morning. This event was informed to Epidemiology and Disease Control Division (EDCD), Teku. We received support from other province and center the next day noon, however patient was cleared by that time. we received total 299 case in first 18 hours and 55 cases were added slowly later to the this list. We managed and reported 364 cases from our hospital in total. But still many priority patients were in ward and emergency waiting for their follow up and medication. Then as 'very important person', VIP's started visiting the hospital, most of the specialist doctors had to entertain them during their visit, which was another contributing factor in hindering patient care. As most of specialist doctors had to entertain them during their visit. In the first 24 hours there was problem in managing food and water for victims. Both issue was informed to local and central authority and was addressed.

DISCUSSION

On 31 March 2019, a powerful "rainstorm" swept across two districts (Bara and Parsa) of southern Nepal killing at least 28 and injuring more than 1,100 people. It was later identified as the first confirmed case of a tornado in Nepal.¹ Bara Hospital situated in bara responded to this event. Medical superintendent acted as incident commander coordinating all activities centrally, though there was no functional hospital incident command system (HICS). The goal of HICS is to simplify communication and establish lines to authority and command.² During that event, it was easy to establish communication as all communication modalities were working. Group chat in social media was effective form of communication during that event. It was effective and efficient. There are some studies on use of social media during communication in crisis.^{3,4} But it more related to risk communication which has both advantage and disadvantages.

We had shortage of medicine acutely but managed through coordination of local shops that were available outside hospital. Planning of this

coordination in disaster management plan is very helpful in terms of optimal utilization of resources in low resource setting like Nepal. Rotating the disaster stock is one of the effective measures of cost saving⁵, however it is not feasible in Nepal. Every district hospital (primary A hospital) and hospital development committee should have some emergency fund.

The surge of patient was well managed during the event by expanding the space available in the hospital and appropriate triaging and referring patients to other centers. It is very essential to plan surge capacity during disaster planning. Health care facility surge capacity has received significant planning attention recently, but there is no commonly accepted framework. The use of refined definitions of surge capacity as it relates to space, staffing, and supply concerns during a mass casualty incident may aid phased implementation of surge capacity plans at health care facilities and enhance the consistency of terminology and data collection between facilities and regions.⁶

However, managing surge at resource limited setup required implementation of triage strategies. The chaos of such event hinders decision making and effective treatment of patient. Disaster is a massive shift of work condition requiring unlimited resources for greatest good of each individual patient to the allocation of care, with limited resources, for the greatest good for the greatest number of patient.⁷ Triage is a tactical art that requires situational awareness, decisiveness, and clinical expertise. Management of each triage setting or type requires planning, training, experience, leadership, and flexibility. A triage decision that all agree is appropriate in one setting may be inappropriate in another. Only a small number of casualties in a mass casualty setting require urgent resuscitation and prompt operative intervention.⁸ The majority of the injured can tolerate varying degrees of delay before surgery.⁵ Application of sound decision-making criteria makes the treatment of large numbers of casualties more manageable, while minimizing confusion, conserving scarce resources, and maximizing patient salvage.

We received 299 patients over 18 hours which is on average 16 patients per hour. Out of them 65.8% had cut injury, 2.9% were critically ill and 2.6% were brought dead. Tornado observed in Jigmsu 2016 Soft-tissue injuries and fractures were the most

frequent injuries. Traumatic brain injuries were the main causes of death.⁹

Conclusion

This was the first tornado event in Nepal. Critical patients were due to head injuries and most of the patients had cut injuries. Disaster plan with HICS, surge capacity and triaging is essential in managing such events.

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