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Fire disaster following LPG tanker explosion at Chala in Kannur (Kerala, India): August 27, 2012

Pramod Kumar *

Burns and Plastic Surgery, Kasturba Medical College, Manipal 576 104, Karnataka, India

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ABSTRACT

A fire disaster following LPG tanker explosion occurred at Chala bypass, Kannur, Kerala, India on August 27, 2012. The three chambered tanker with total 16 tonnes (162.57 quintal) LPG collided with a road divider and exploded thrice. A total of 41 people became victims during first blast; out of which 20 died in various hospitals. Five people remained inside the house after first blast and escaped unhurt from the zone of accident before second blast. All the victims were transferred to various hospitals; of these, six were transferred to the burns unit of the Kasturba Hospital, Manipal (320 km from Chala). Five (5/6) were transferred within 1–5 days at our burns unit suffered 31–72% total body surface area (TBSA) burn, none had external injuries. One (1/6) was transferred on 20th day as a follow up case of 15% TBSA burn with 4% residual raw area and diabetes mellitus. Except one, all were managed conservatively using Limited access dressings (LAD; Negative Pressure Wound Therapy). One of the patient wound bed prepared under LAD and on 41 post burn day underwent split skin grafting under LAD. Out of the six patients admitted at the burns unit, two (2/6) admitted patients expired (one due to inhalation injury and another due to sepsis with multiple organ failure). One survivor (1/4) developed sepsis related liver dysfunction with hepatomegaly but recovered well. The total hospital stay of survivors at the burns unit varied from 8 to 60 days (mean hospital stay 36.5 days). All the victims who developed psychological symptoms were treated by psychiatrists and counselled before discharge. Three of survivors developed psychological symptoms. Two of them (2/3) developed mixed anxiety-depression disorder (ICD 10 code F41.8) and one of these two showed grief reaction too (ICD 10 code F43.23). One victim (1/3) developed non-organic insomnia (ICD 10 code F51.0) and responded to counselling. The article describes the incident, mechanism of the incident, injuries sustained, author, explanations on pattern of burn and suggestions in relation to future safety measures.

1. Introduction

Disaster is a crisis situation that far exceeds our capabilities to recover. In other words, a disaster is defined as a level of disruption which cannot be absorbed by the adjustment capacity of the affected community within its resources. Usually the resources for health management are limited, overstretched and in disaster it is disrupted. Many people develop psychological symptoms following disasters, and yet the vast majority of them recover due to the resilience of human nature. At the same time, many of those people will develop psychological disorders such as major depression, generalized anxiety, and posttraumatic stress disorder. Many more experience non-specific distress, somatic complaints and other medical health conditions. For better medical and

* Tel.: +91 820 2571201.
E-mail addresses: pkumar86@hotmail.com, kumar.drpramod@gmail.com.
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psychological health management it is advisable to have better plan and better preparedness. This strategy for preparedness, prevention and minimizing risk of disaster is better formulated in pre-disaster phase based on previous experiences. A fire disaster following LPG tanker explosion occurred at Chala bypass, Kannur, Kerala, India on August 27, 2012. The present fire disaster is being recorded for future reference, improvement in similar disaster prevention plan and better planned care in future.

2. Methods

The information was collected by the author from media, victims, eye witnesses and rescuers. Also, the author visited the site after 17 days of the accident and collected the information. The District Collector and District Medical Officer were interviewed. Author visited Pariyaram Medical College where he met three victims waiting for discharge. Author also studied the various photographs taken subsequent to accident (provided by the relatives of the victims).

3. Observations

3.1. *Pre-disaster warning*

The driver of the LPG tanker quickly informed about the incidence to the local people and advised not to light fire, use mobiles or to manipulate electric switches. Soon local authorities were informed and electric supply was cut. The cause of fire could not be found. Though local people in unorganized way started running and informing people, there was no continuous announcement for what to do/not to do.

3.2. *The disaster*

3.2.1. *The event*

The disaster occurred on August 27, 2012 at Chlala village in Kannur district of Kerala state of India (Fig. 1a and b). An Indian Oil Corporation LPG tanker rammed a divider in an attempt to overtake a vehicle at the Chala bypass near Bhagavathy Temple at 11 p.m. The tanker containing LPG had three chambers with total 16 tonnes (162.57 quintal) LPG in it. The wall of the container was made of 1 cm thick steel. The LPG vapour was seen to flow slowly all around at the ground level like cloud of white colour gas (as described by eye witness) that burst into flames within 20 min. The blast sound was heard up to 25 km distance and was soon followed by two more blasts at 3 min interval. People witnessed sudden short duration fire rising upwards above the coconut tree (approximately 50 feet high) within involved area. After third blast approx one third part of container was thrown like missile approximately 60–70 feet above the ground passing over coconut trees (Eye witness) and later found about 500 m away from the site of accident in a field.

3.2.2. *The impact*

3.2.2.1. *On immediate medical need*. All the coconut trees in the zone of fire were burnt. In the centre of the involved zone all the burnt green vegetation included more than 50 feet high coconut trees up to the top and grass at the ground level, but those towards the periphery the height of burnt portion of coconut trees was seen to reduce progressively; green leaves in upper portion of trees were spared (site marked A in Fig. 2). Gross at ground level at the periphery of the affected zone (site marked as B in Fig. 2) was not burnt. The vegetations on the other side of seven feet high brick wall were also spared (Fig. 3).

There were total 41 victims; out of which 20 died in various hospitals. Five people (Three males – 40 year, 55 year, 65 year and two females – 48 year, 55 year) moved away from the zone of accident after leak but before it burst into fire and escaped. Five people (two males – 13 year, 27 year; three females – 24 year, 50 year and 93 year) could not escape before first blast and remained inside the house and then could escape unhurt from the zone of accident before second blast. One of the victims who was disabled due to pre-existing illness less than 50 m from the site of accident could not escape and succumbed to his extensive injuries. At the time of first blast all those who were curious and out of their house were burnt severely. Those who were watching from inside the house with doors open sustained mild to moderate burn.

3.2.2.2. *On physical environment*. Total 7 shops, thirty five individual houses were burnt. Three houses within 50 feet from the site of accident were completely burnt. Two thatched roofs were blown off. Walls of the houses and windows were damaged from outside. There were no significant damages inside the houses at the peripheral zone. Total 60 vehicles were reported to be damaged. There was no damage to roads and communication system. Electric supply was disrupted for two days.

3.2.2.3. *On veterinary population*. Within the zone of accident two dogs, two hens and one cat were found dead.

3.2.2.4. *Psychological consequences*. Initially all the victims showed fear, anxiety and helplessness. Next day some of them showed frustration and anger (expressed on the people taking photograph of the site of accident). Within next few days following sharing of the experiences, emotional support (by friends, relatives and local psychologists) and social support for disruption (by Government and LPG company) losses were accepted and process of rebuilding life started.

All the patients were assessed using self-reported and observer rated questionnaires and interviews [1].

Three of survivors developed psychological symptoms. Two of them developed mixed anxiety-depression disorder (2013 ICD-10-CM Diagnosis Code F41.8) and one of these two showed grief (adjustment) reaction too (2013 ICD-10-CM Diagnosis Code F43.23). One victim developed non-organic insomnia (ICD-10: version 2010: Code F51.0) and responded to counselling but had anxiety related distress even after 1 month of discharge while all other had started normal life.

3.3. *All the victims were transferred to various hospitals*

Total seven victims were shifted to adjacent state Karnataka, out of which six victims (Table 1) were transferred to the burns unit of the Kasturba Hospital, Manipal (320 km from Chala). Of