D34 An Explosion of a Primitive Industrial Oven in India: A Forensic Analysis

Jatin Bodwal, MD, Deen Dayal Upadhyay Hospital, New Delhi 110064, INDIA; Anil Aggrawal, MD, Maulana Azad Medical College, New Delhi 110002, INDIA*

Learning Overview: After attending this presentation, attendees will understand the workings of a primitive type of industrial oven and the various causes behind its explosion.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by discussing the workings of a primitive type of industrial oven and the various causes behind its explosion.

The explosion of an industrial oven results in an extremely devastating outcome, which usually claim the lives of people who unfortunately are present in proximity of the blast site.

Invariably, inadequately trained and impoverished people who migrate to New Delhi (the capital city of India) from poor states such as Bihar and Uttar Pradesh are the ones who risk their lives every day while working in a factory where these primitive industrial ovens operate.

Working of an industrial oven: (A seven-minute video will be shown to explain the working of a primitive industrial oven.) A typical industrial oven has two doors, one entry and one exit. Both the entry and exit doors can be used interchangeably (Figure 1). Inside this oven is chamber in which there are two parallel rods that are placed at the bottom of the chamber. These rods have multiple holes that light up due to the supply of Liquefied Petroleum Gas (LPG) and generate a high degree of temperature inside the chamber. The temperature monitoring is done by a thermometer that hangs on the ceiling. The usual temperature generated for optimum working of the oven is ranges between 120°C to 170°C. Surprisingly the source from which the oven get its heat is a typical household LPG cylinder (Figure 2). The sliding fashion assembly of metallic plates or other circular-shaped table fan tops or ceiling fan tops go inside the chamber and both the doors are closed (Figure 3). The assembly of metallic plates is usually arranged in the row. This assembly of objects remain inside the chamber for about 15 to 30 minutes. The purpose of this oven is to get the metallic paint firmly stuck to the surface of these objects.

Presented here is the case of a worker who died on the spot due to an oven blast while working. The main reason that can be attributed to the blast will be thoroughly discussed. In this instance, a worker was working in the factory when a fellow worker rushed to the oven when they heard a loud blast sound. They found a worker lying on the floor, injured. They rushed him to hospital, but he was declared dead on arrival.

At autopsy, the deceased was found to have suffered both burn injuries in the form of superficial burn and blunt injuries, in the form of a fracture (Figures 4 and 5). Death was attributed to the head injury and multiple fractures.

The chief reason for an oven blast is an extremely high temperature inadvertently generated if a worker forgets to switch off the supply of LPG gas or open the gates. Most of the modern sophisticated industrial ovens are equipped with safety valves, which function to alleviate excess heat. If the valve become dysfunctional owing to some clogged pipe or the oven is not equipped with safety valves, then excess temperature causes an oven blast.

India is a developing country where ill- or inadequately trained youths jump into factory work where these primitive types of oven are being used, without knowing the potential hazards of their job. Safety gears, which should be essential while working, are hardly ever provided by the employer to these poor workers. Only certified persons who take formal training from recognized institutes for working in factory should be hired.

Fig. 1: Door of industrial oven unit

Fig. 2: Household LPG cylinder

Fig. 3: Assembly of metallic objects

Fig. 4: Burn injuries on the body of deceased

Fig. 5: Fracture of the humerus bone

Explosion, Industrial Oven, India