Short Communication

Chlorine Gas Leak: A School Incident in Andhra Pradesh

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ABSTRACT

A gas leak occurred affecting the teaching staff as well as 65 students of a school in Andhra Pradesh, of whom 9 became seriously ill. The students were shifted to the nearest hospital. Many were treated on an out-patient basis, while 9 students were admitted for 2 days, and then discharged.

Since the parents were still apprehensive about long-term sequelae arising from the exposure, the district collector directed the district medical and health officer to investigate and take necessary steps. The latter arranged a medical camp involving several medical officers under the guidance of a team of clinical toxicologists and community medical care specialists from a major teaching hospital of the area. Detailed examination and investigations were done, and all the cases were followed up. None went into long-term complications.

Key Words: Chlorine, Gas leak

Introduction

One afternoon, at a school in Sangareddy district of Andhra Pradesh, while everybody was busy in various classrooms, a sudden gust of pungent smell struck the school's occupants. Teachers and students ran out of classrooms coughing, many of them experiencing a suffocating sensation, chest pain, and burning eyes. There was panic due to confusion as to the source of the irritating gas. Among the students, most of the boys ran away from the main area of exposure, while many girls who did not do so developed symptoms, mostly of respiratory irritation. They were rushed to the nearby hospital. Most of the victims were only mildly affected, but 9 students had to be admitted for more specialized care. Subsequently it was ascertained that the cause of the leak was breakage of a chlorine gas pipe at the nearby water pumping station, with release of chlorine into the atmosphere.

Since the parents of the affected children were very worried about long-term sequelae of the exposure, the district collector organized a medical camp a few days after the incident in collaboration with the district medical and health officer. A team of doctors comprising general physicians, clinical toxicologists and community health specialists was constituted. Detailed examination of all 65 victims was done. Nine of the children who had suffered serious manifestations of respiratory irritation still complained of giddiness, palpitations, tremors, headache, nausea, dysphagia and mild photophobia, even though ten days had elapsed since the incident.

On detailed examination, the following features were recorded as the most common among these nine victims:

1. Pyrexia around 101^0F
2. Redness of eyes and skin
3. Sour aftertaste over the tongue and oral mucosa
4. Congestion of the throat and earache
5. Chest pain which intensified on deep breathing
6. Epigastric tenderness
7. Occasional rales and ronchi on auscultation

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The children were subjected to detailed investigations to know the extent of damage to the lungs, throat, and upper gastrointestinal tract. Emphasis was laid on pulmonary function tests, chest X-ray, otorhinolaryngologist's and ophthalmologist's evaluation, and upper gastrointestinal endoscopy. Treatment was carried out using oxygen supplementation, and administration of common drugs such as paracetamol, bronchodilators, H_2 receptor antagonists, proton pump inhibitors, antacids, antispasmodics, antibiotics, and cough expectorants. In some cases, steroids were administered.

On subsequent follow-up, all the children recovered completely, and various concerns of the parents about long-term sequelae were addressed. None of the children on repeat examinations over a period of time revealed evidence of any complications.

Discussion

Chlorine is a greenish-yellow gas, with a pungent, strongly irritating odour.[1] It is widely used as a disinfectant, and bleaching and cleansing agent. It is commonly used for treatment of community drinking water supply and swimming pools.

On contact with moist airways and upper gastrointestinal tract, chlorine produces hydrochloric acid, hypochlorous acid, and nascent oxygen. Apart from the corrosive effect of both acids on the mucosa, additional damage to the body is done by nascent oxygen, which initiates the free radical cascade. Both the acids also disturb the acid-base balance of the body leading to metabolic acidosis. Exposure to 1:1000 atmospheric concentration of chlorine can be rapidly fatal.

The usual treatment for acute exposure is mostly supportive, with oxygen inhalation, bronchodilators, etc.[2]

Long-term sequelae include asthma and reactive airways dysfunction syndrome (RADS).[3] Corticosteroids may help in minimizing the incidence of these complications. In this particular case, because of quick action on the part of the district administration and health officials, none of the affected victims suffered serious consequences, nor long-term complications.

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