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A Rare Case of Kerosene Poisoning With Right Sided Pleural Effusion

KEYWORDS: kerosene aspiration, pleural effusion,type II pneumocytes.

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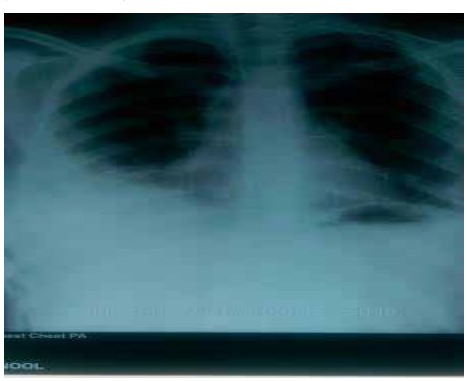
ABSTRACT *Kerosene oil, a petroleum product, is a mixture of hydrocarbons contaminated with organic sulphur. Petrol, gasoline, Vaseline and paraffin are other related hydrocarbons. Lethal dose of kerosene oil is 30 to 100 ml. Kerosene ingested, intentionally or accidentally, is toxic. Data is scarce on complications and outcomes of hydrocarbon poisoning following kerosene aspiration in adults . There has been few known cases of right sided pleural effusion occurring due to it in literature.We, hereby, report a case of a right sided pleural effusion secondary to kerosene aspiration in a 15-year old female.*

INTRODUCTION

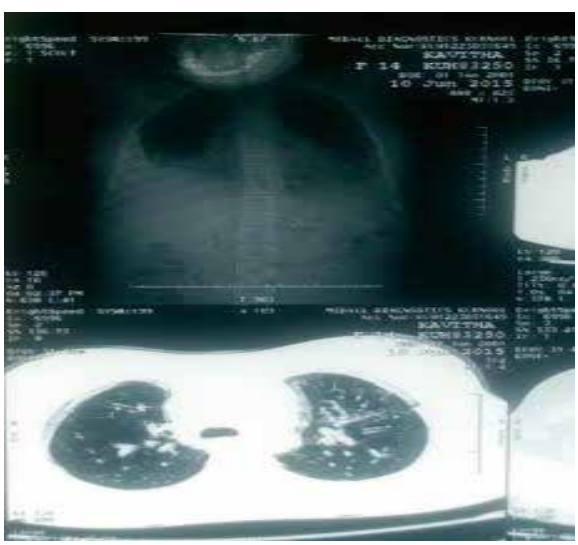
Kerosene oil poisoning leading to aspiration is a very uncommon mode of hydrocarbon poisoning in adults. The most serious side effect is aspiration pneumonia. Hydrocarbon aspiration (HA) can cause significant pulmonary disease by inducing an inflammatory response, hemorrhagic exudative alveolitis, and loss of surfactant function. Secondary effects in the lungs include pneumothorax, pneumatocele, or bronchopleural fistula and pleural effusion.

CASE REPORT

A 15-year young female presented in emergency department with history of ingestion of kerosene (around 20 ml) with suicidal intent, 6 h before admission. On examination, she was tachypnic (respiratory rate—29/min). Her vitals were stable and other systemic examination was normal. Initial arterial blood gas (ABG) analysis, hemogram, serum electrolytes,electrocardiogram and x-ray chest were normal.we admitted the case and gave supportive treatment.After three days she developed chest-pain ,breathlessness,and productive cough.we ordered repeat x-ray film which showed right sided pleural effusion without pneumonia.sputum gram staining and acid fast stainig and culture,sensitivity showed no organisms.pleural effusion analysis showed fluid is transudate in nature and yields no organisms.CT chest also confirmed x-ray findings.



x-ray PA view showing right plural effusion



CT –chest showing right plural effusion

The patient was treated with oxygen supplementation, oral corticosteroids (prednisolone at 1 mg/kg body weight). We did not gave any antibiotics to patient. The patient responded to the treatment and improvement in breathlessness and pleuritic chest pain and cough after 7 days of treatment. A repeat x-ray done after 15 days showed resolution in effusion .Steroids after tapering was stopped after 3 weeks. The patient was discharged in a stable condition.

DISCUSSION

Kerosene is a thin, clear liquid formed from a complex mixture of hydrocarbons, with density of 0.78–0.81 g/cm^3. It is obtained from the fractional distillation of petroleum between 150 and 275°C, resulting in a mixture of carbon chains that typically contain between 12 and 15 carbon atoms per molecule. In India, kerosene is the main fuel used for cooking and lighting among the poor.

Kerosene is toxic both through inhalational and oral routes.

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Inhalation results in dizziness, nausea, vomiting, burning sensation in chest, dry cough, headache and ataxia. Severe poisoning produces pulmonary oedema, haemoptysis, mental confusion, hallucinations, stupor, cyanosis, convulsion and coma. Death is mainly due to ventricular fibrillation and respiratory failure. Ingestion of kerosene oil produces burning pain in the mouth, throat, dry irritating cough, nausea, vomiting, colicky abdominal pain and diarrhoea. Large quantity of oil can produce neurological dysfunction similar to the one described for inhalational toxicity. The pupils are initially constricted and later dilated. Aspiration of as little as 0.2 mL of kerosene oil can produce chemical pneumonia and pulmonary oedema. The breath, vomitus and urine gives off the peculiar smell of kerosene. The chest radiograph may reveal perihilar densities, basal pneumonia, and atelectasis.

This damage depends on the viscosity (the resistance to flow, measured in Saybolt Seconds Universal [SSU]); volatility (the propensity to vaporize) and the chemical side chains of the hydrocarbon. Among them, viscosity is the single most important determinant of aspiration risk. Lower viscosity, especially less than 60 SSU and higher volatility are associated with a greater chance of aspiration with resultant pulmonary injury. The type II pneumocytes are the most affected resulting in decreased surfactant production. This decrease in surfactant results in alveolar collapse, ventilation – perfusion mismatch and hypoxemia. Alveolitis can occur which peaks 3 days after ingestion. The end result of hydrocarbon aspiration is interstitial inflammation, intra alveolar edema, bronchial necrosis, and vascular necrosis.Thalveolitis and bronchial and vascular necrosis can result in a pleural effusion, which has been rarely reported. Rare pulmonary complications include the development a pneumothorax, pneumatocele, or bronchopleural fistula. A rare complication of kerosene intoxication is cardiac arrhythmia and ventricular fibrillation, attributed to increased myocardial sensitivity to endogenous catecholamines. Gastrointestinal involvement, as observed in our patient, is manifested by vomiting, abdominal pain and diarrhea has been attributed to mucosal irritation. Symptoms and radiological findings resolve rapidly after cessation of exposure and corticosteroid therapy.

In case of inhalational toxicity, remove the victim to open air, ensure patent airway, keep the body warm and on hospitalisation administer oxygen. Following ingestion, induction of vomiting or gastric lavage is contraindicated due to increased risk of aspiration. Activated charcoal is not useful. Antibiotic are not indicated. Victims with severe respiratory symptoms and abnormal radiography should be observed for complications and managed appropriately for at least 2 to 3 days.

CONCLUSION

Symptomatic and supportive care are the main stay in the management of hydrocarbon exposure. Treatments are controversial and individualised. Long term follow of severely symptomatic case for the development to chronic lung diseases.

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