

Bilateral Pleural Effusion with Skin Lesions Following Suicidal Attempt with Kerosene

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Abstract

Kerosene (paraffin or lamp oil), the liquid hydrocarbon is a common household commodity of low-income families in developing countries used for cooking and lighting lamps. Still, kerosene is rarely ingested with suicidal intent by adolescents or adults. Pneumonitis is the most frequent manifestation of kerosene aspiration but bilateral pleural effusion is very rare. Kerosene being an irritant may cause dermatitis upon direct contact with skin. We report for the first time acute contact dermatitis and bilateral pleural effusion with pneumonitis in a 17-year-old adolescent girl following suicidal attempt with kerosene. Pleural fluid was exudative and kerosene induced bilateral pleural effusion and skin lesions resolved within two weeks of conservative treatment.

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Key words: Kerosene, Suicide, Pneumonitis, Dermatitis, Pleural effusion.

Introduction

Kerosene (paraffin or lamp oil) is a thin liquid hydrocarbon used in the developing countries for lighting lamps and for cooking usually by poor families. Still, kerosene ingestion by any adolescent or adult for committing suicide is rare. Kerosene once ingested may get aspirated easily into the lungs because of its low viscosity and high volatility and most cases are not fatal.¹ Pneumonitis is the most frequent manifestation of kerosene aspiration and occasionally secondary complications, like pneumothorax, pleural effusion, pneumomediastinum, subcutaneous emphysema and pyopneumothorax have been reported.^{2,3} Acute irritant contact dermatitis following direct contact with kerosene is rare.⁴ We report an unusual case of kerosene induced acute contact dermatitis and bilateral pleural effusion with pneumonitis in a 17-year-old adolescent girl following suicidal attempt.

Case Report

A 17-year-old adolescent girl was referred to us for evaluation of fever, breathlessness and pleuritic chest pain. One day before, she was admitted for vomiting and lethargy following ingestion of kerosene with suicidal intent in her house. She was reported to have consumed about 100 mL of kerosene before the kerosene container was snatched by her father and rushed her to the hospital. Few minutes before, she had a verbal quarrel with her father. While drinking

hurriedly, kerosene smeared her lips and the skin around the mouth resulting in pain, redness, dryness and skin lesions few hours later. Medical history was not remarkable. Personal and family history were negative for any psychiatric illness. On physical examination, she was breathless and lips were dry with perioral pustules (Figure 1). Her pulse rate was 110 per minute, respiratory rate was 26 breaths/minute, body temperature was 101.2 °F, blood pressure was 90/60 mmHg and room air oxygen saturation by pulse oximetry was 86%. Chest examination revealed diminished breath sounds bilaterally over lower lobes. Examination of other systems was unremarkable.



Figure 1. Clinical photograph of the patient showing dry lips and perioral pustules.

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Urine and blood examination reports were not significant. The postero-anterior chest radiograph (Figure 2) was suggestive of bilateral pleural effusion. As there was no cough, sputum induction was done and reports were inconclusive. Patient was reluctant to undergo flexible bronchoscopy, as she felt better. Ultrasound examination showed bilateral pleural effusion with normal abdominal findings. Diagnostic thoracentesis under ultrasound guidance yielded thin straw-coloured pleural fluid. Pleural fluid was exudative with 76% lymphocytes. All the other pleural fluid reports were negative. Computed tomography (CT) of the chest (Figure 3) showed bilateral pleural effusion with lower lobe consolidation. Conservative treatment with

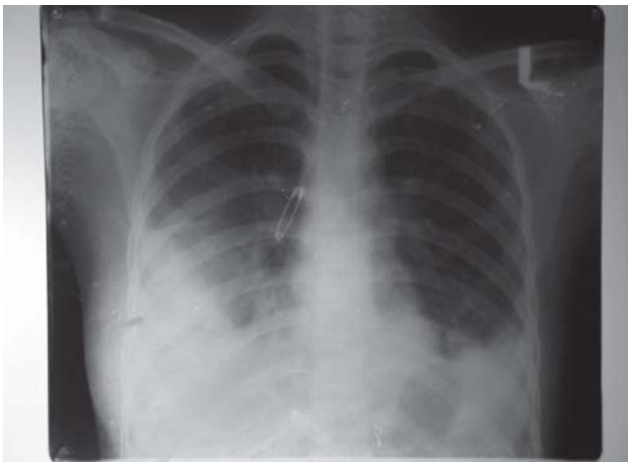


Figure 2. Chest radiograph (postero-anterior view) showing bilateral pleural effusion.



Figure 3. Computed tomography of the chest (mediastinal window) showing bilateral pleural effusion with areas of consolidation.

supplemental oxygen, nebulised salbutamol and intravenous antibiotic (amoxycillin-clavulanic acid) resulted in significant clinical improvement within three days. The dermatologist diagnosed the perioral skin lesions as kerosene induced contact dermatitis and prescribed topical betamethasone and

framycetin. Psychiatrist opined that kerosene ingestion was a deliberate self-harm attempt of impulsive type and ruled out any pre-existing significant mental illness. Patient became asymptomatic and perioral skin lesions healed (Figure 4) with treatment and patient was discharged after two weeks. Computed tomography of the chest (Figure 5) done at one month after discharge showed clearance of bilateral pleural effusion and minimal residual parenchymal lesions.



Figure 4. Clinical photograph of the patient showing normal lips and healed perioral skin lesions.



Figure 5. Follow-up computed tomography of the chest showing clearance of bilateral pleural effusion and minimal residual parenchymal lesions.

Discussion

Kerosene poisoning among adults whether accidental or after suicidal attempt is unusual. The risk and severity of aspiration is not related to the volume of kerosene ingested and experimentally as little as 0.06 mL/kg of kerosene administered intra-tracheally caused acute bilateral pneumonitis similar to higher dose (0.3 mL/kg) but the severity of pulmonary changes was less and recovery was faster with less dose.⁵ In our case, the volume of kerosene actually aspirated was probably less compared to the volume of kerosene ingested and this might have contributed to quick recovery. The aspirated hydrocarbon can affect the lungs through different mechanisms.⁶ Poorly water soluble hydrocarbons, like kerosene, may quickly reach lower

airways producing bronchospasm and an inflammatory response. Secondly, the hydrocarbon may displace oxygen in the alveolar space causing hypoxaemia. Thirdly, hydrocarbon can cause direct injury to pulmonary parenchyma and capillaries producing hyperaemia, diffuse haemorrhagic exudative alveolitis with granulocytic infiltration and micro-abscesses. Finally, the direct toxic effect of hydrocarbon on type II pneumocytes can reduce surfactant and alveolar collapse may result. These mechanisms lead to alveolar dysfunction, ventilation-perfusion mismatch, hypoxaemia and respiratory failure. The severity of hydrocarbon induced pneumonitis is variable and the pathologic changes result from inflammatory reaction due to activation of macrophages and release of inflammatory cytokines.⁷ The lipid acids of hydrocarbon in the alveoli remain unaltered and may get emulsified or phagocytosed by the activated macrophages. Detection of these lipid containing macrophages or foamy cells through appropriate staining techniques of sputum or bronchoscopic specimens is diagnostic of lipoid pneumonia.⁸ In our case, flexible bronchoscopy was not done in view of witnessed history of kerosene ingestion and rapid recovery.

The first reported Indian case of kerosene induced bilateral haemorrhagic pleural effusion in an adult was accidental and the cause was speculated to be due to haemorrhagic alveolitis with bronchial and vascular necrosis.⁹ In our case, bilateral exudative pleural effusion probably resulted from less severe form of alveolitis in the sub-pleural area. Kerosene is an irritant to the skin and dissolves the lipid within the stratum corneum leading to development of bullae, blisters, blebs, maculopapular rashes and even first degree burns.¹⁰ In our case, pustules were formed in the skin directly in contact with kerosene while drinking which resolved with topical treatment in about a week. In an adult, kerosene-induced pneumonitis with effusion may resolve with

conservative treatment and CT of the chest is very useful for documenting the extent of pulmonary lesions, associated complications and follow-up of treatment outcome.¹¹ *To the best of our knowledge*, this is the first case of kerosene induced bilateral pleural effusion with acute contact dermatitis in an adolescent in the English literature.

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