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Case Report

Chemical pneumonitis due to accidental aspiration of diesel: a case report

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ABSTRACT

A 39 year old male, with no significant previous medical illness, accidentally ingested diesel and subsequently developed chemical pneumonitis and he presented with typical clinical and radiological features of chemical pneumonitis. The diagnosis was confirmed by demonstrating foamy macrophages in bronchial lavage. The case is being reported due its rarity.

Keywords: Diesel, Aspiration, Chemical pneumonitis, Foamy macrophages

INTRODUCTION

Diesel is distilled from petroleum which is used as fuel for engines. Diesel exposure can occur after ingestion, inhalation or through direct contact with skin. People can take it intentionally for self-harm or inhale it for recreational abuse. Siphoning of oil can lead to accidental ingestion and aspiration. Due to low viscosity and volatility it has high potential for aspiration, which can lead to chemical pneumonitis.[1]

CASE REPORT

A 39 year old male, construction worker with no previous medical illness, presented with history of accidental ingestion of diesel. He is a never smoker and gives history of occasional intake of alcohol. He had mistaken diesel kept in sprite bottle and had taken one sip, following which he developed severe bouts of cough. Immediately patient was taken to nearby hospital. There he had an episode of syncope and was referred to our centre. At the time of admission, he was conscious, oriented to time, place and person, blood pressure was 110/80mmHg and oxygen saturation was 91 at room air, heart rate was 90 per minute and he was afebrile.

On auscultation of the respiratory system showed bilateral crepitations.

His initial blood reports showed WBC count of 15800 with 90% neutrophils (Table 1). Chest x-ray showed bilateral infiltrates (Figure 1). Hence, he was started on IV ceftriaxone and metronidazole.

He became progressively more tachypnoeic along with desaturation (85% in room air). He was shifted to the intensive care unit where he was put on non-invasive ventilation. His ABG showed PH-7.51, PaO_2-92, PCo_2 34, HCO_3-27. Repeat chest radiograph showed increasing opacities in both lower zones (Figure 2).

He was empirically started on IV methylprednisolone. CT thorax was taken which showed multilobar consolidation along with ground glassing and interlobar septal thickening in bilateral lung parenchyma along with few tiny cysts (Figure 3).

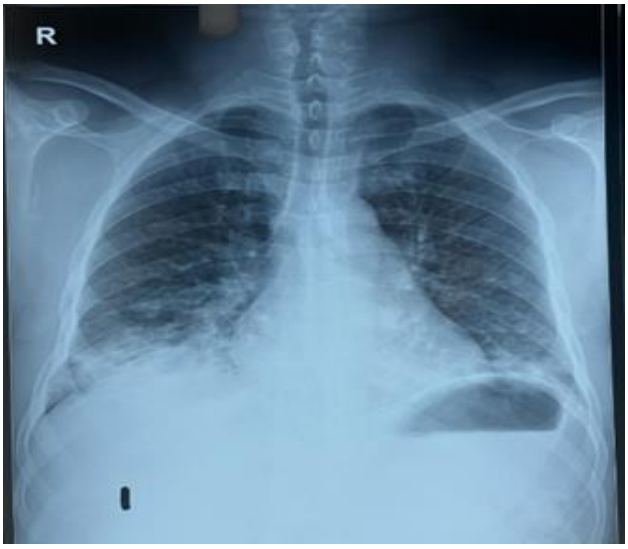

Figure 1: Chest x-ray showing bilateral infiltrates more on the right lower zone suggestive of aspiration pneumonitis.

Figure 2: Chest X-ray showing bilateral dense infiltrates.

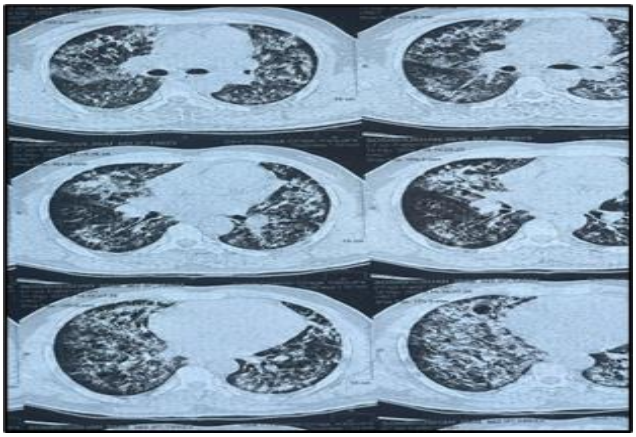

Figure 3: HRCT chest showing bilateral patchy consolidation, ground glass opacities and septal thickening.

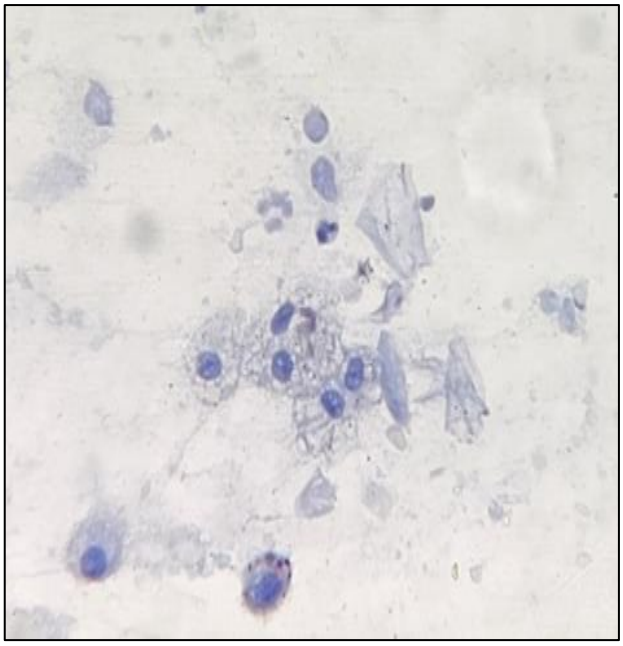

Figure 4: Wet fixed PAP smear showing clusters of foamy macrophages with multiple tiny intracytoplasmic vacuoles 400×.

Patient had persistent desaturation with room air saturation 75% for about 2 weeks and was managed with oxygen and NIV. His blood and sputum culture were sterile. Gradually patient was weaned off from NIV and shifted to ward with minimal oxygen support.

A fibro optic bronchoscopy was done and bronchial lavage was sent for cytology with specific request to look for foamy macrophages and was positive for foamy macrophages which eventually confirmed the diagnosis of chemical pneumonitis (Figure 4). Patient clinically improved and blood counts became normal. He is doing fine on follow up.

Table 1: Routine investigations results.

Parameters	Value
Hb	14.9 g%
TC, DC	15,800, N90, L8, E2
CRP	46.3
RBS	108 mg/dL
Blood urea/creatinine	21 mg%/1.1
ECG	Normal sinus rhythm
LFT	Normal
HIV/Hbs (Ag), Anti-HCV	Negative
Blood culture	Sterile
Sputum culture	Normal pharyngeal flora
ABG	PH 7.47, PaO_2-79, $PaCO_2$-41, HCO_3-29
Sputum true NAAT	Negative

DISCUSSION

Chemical pneumonitis is an acute, severe pneumonitis caused by aspirating or inhaling volatile hydrocarbon compounds with low viscosity and surface tension. Hydrocarbon pneumonitis following aspiration of diesel is a form of exogenous lipoid pneumonia. Hydrocarbons do not get absorbed into the airways after aspiration. The fuel is trapped by the alveoli, cause inflammatory responses, bronchial oedema, and tissue damage.[1] The emulsified and engulfed hydrocarbon by alveolar macrophages can remain inside for a long time, which are released into the alveoli in a timely fashion following disruption of the macrophages, inciting a giant cell response leading to fibrosis and disruption of bronchial and alveolar structure.[2] Patients usually presents with intense chest pain, acute dyspnea, cough, and fever, all appearing a few hours after inhalation.[3] It is estimated that even <1 ml of hydrocarbon is sufficient to induce lung injury.[2]

Diagnosis of patients who may have aspirated diesel depends on three criteria: presence of pulmonary symptoms following an episode of fuel intake, typical manifestations on radiologic investigations (CXR or chest CT) and lipid-laden macrophages on BAL or pathologic findings.[4] The radiological opacities are typically ground-glass or consolidation which is bilateral, lobar and segmental in distribution and predominantly involve the middle and lower lobes. Other manifestations of acute exogenous lipoid pneumonia include poorly marginated nodules, pneumatoceles, pneumomediastinum, pneumothorax, and pleural effusions.[5] Detection of lipid containing cells or foamy macrophages through appropriate staining techniques is diagnostic of lipoid pneumonia. In majority of the reported cases of diesel induced pneumonitis, the diagnosis was made through bronchoscopic specimens.[6]

Treatment is fundamentally symptomatic, even in cases with significant lung involvement. These include respiratory support and prevention of complications, which are sufficient in most cases. Corticosteroids and antibiotics should not be used routinely as a prophylactic measure as there is no good supporting evidence for the use of either.[7]

CONCLUSION

Diesel fuel aspiration can occasionally result in an uncommon but potentially deadly condition called chemical pneumonitis. siphoning petroleum or diesel is quite common. But accidental ingestion and aspiration of diesel leading to sudden onset respiratory distress is rarely reported. Patients with suspected hydrocarbon induced chemical pneumonitis should receive prompt medical attention to prevent life-threatening complications. Healthcare providers should be aware of this condition and consider it in patients with a history of hydrocarbon exposure and respiratory symptoms.

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