

## HYDROCARBONS (KEROSENE) POISONING

- Hydrocarbons include a wide array of chemical substances found in thousands of commercial products. exposure will produce systemic toxicity, local toxicity, or both.
- aspiration of hydrocarbons into the lung can lead to serious, even life-threatening toxicity.

### Effect on respiratory system:

The most important adverse effect of hydrocarbons is aspiration pneumonitis

Aspiration usually occurs:

- at the time of ingestion, when coughing and gagging are common.
- secondary to vomiting, which commonly occurs after ingestion.
- The propensity of a hydrocarbon to cause aspiration pneumonitis is inversely proportional to its viscosity.
- Compounds with low viscosity, such as mineral spirits, kerosene, gasoline, and lamp oil, spread rapidly across surfaces and cover large areas of the lungs when aspirated. Only small quantities (<1 mL) of low-viscosity hydrocarbons need be aspirated to produce significant injury.
- Pneumonitis does not result from dermal absorption of hydrocarbons or from ingestion in the absence of aspiration.

### Effect on gastrointestinal system:

- Gasoline and kerosene are poorly absorbed, but often cause considerable gastrointestinal mucosal irritation as they pass through the intestines.
- Several chlorinated solvents, most notably, carbon tetrachloride, can produce hepatic toxicity.

### Effect on central nervous system:

- Certain hydrocarbons, most notably, halogen substituted compounds, can be absorbed after ingestion, inhalation, or dermal contact. Most of these hydrocarbons have anesthetic properties and can cause transient CNS depression.
- Chronic abuse of volatile hydrocarbons can lead to cerebral atrophy, neuropsychological changes, peripheral neuropathy.

### Effect on hematological system:

- A few hydrocarbons have also been associated bone marrow toxicity. Benzene is known to cause cancer in humans after long-term exposure. The malignancy most commonly associated with benzene is acute myelogenous leukemia.
- Methylene chloride, found in some paint removers, is metabolized to carbon monoxide.
- Nitrobenzene, aniline, and related compounds can produce methemoglobinemia. Methemoglobinemia is treated with the antidote methylene blue.

### Effect on circulatory system:

A number of volatile hydrocarbons, including toluene, refrigerants, and volatile nitrites, are commonly abused by inhalation. Some of these substances can sensitize the myocardium to the effects of endogenous catecholamines, with the risk of dysrhythmias and sudden death.

### **Effect on renal system:**

- A few hydrocarbons have also been associated with renal disease.

### **Effect on skin:**

All volatile hydrocarbons are lipid solvents and can cause defatting of the skin, producing local irritation or, with prolonged exposure, chemical burns.

### **Clinical and Laboratory Manifestations:**

- Transient, mild CNS depression is common after hydrocarbon ingestion.
- Aspiration is characterized by coughing, which usually is the first clinical finding. Cough usually begins immediately or within 2-5 min of the aspiration, and persists.
- Respiratory symptoms may remain mild or may progress rapidly to respiratory failure.
- Patient symptoms often correlate very poorly with abnormalities observed on chest radiograph.
- Fever occurs and may persist for as long as 10 days after aspiration. Accompanying leukocytosis may be misleading because, in most cases of aspiration pneumonitis, no bacteria are present in the lungs.

### **Investigation**

- Blood – Leukocytosis
- X – Ray changes: Chest radiographs may be normal for as long as 8-12 hr after aspiration, but more often will be positive after 6 hr or longer from the time of exposure. whenever possible, chest radiograph should be delayed until 6 hr or longer after the hydrocarbon exposure.

Chest radiographs may remain abnormal long after the patient is clinically normal, and they should not be used to guide acute treatment.

Pneumatocoles may appear on the chest radiograph 2-3 wk after exposure.

### **Treatment:**

- Emesis is contraindicated because of the risk of aspiration.
- gastric lavage is contraindicated, except under special circumstances of ingestion of highly toxic hydrocarbons (carbon tetrachloride), because of the risk of vomiting and aspiration.
- If gastric lavage is to be performed, the patient should be intubated with a cuffed tube to protect the airway from further aspiration.
- Activated charcoal also is not useful because it does not bind the common hydrocarbons.
- If hydrocarbon induced pneumonitis develops, respiratory treatment is supportive.
- Corticosteroids should be avoided because they are not effective and may increase the risk of infection.
- Prophylactic antibiotics should not be given because bacterial pneumonia occurs in only a very small percentage of cases.
- Respiratory failure has been successfully treated both with standard ventilation and with extracorporeal membrane oxygenation.
- All patients with significant clinical findings or an abnormal chest x ray 2-6 hours after ingestion should be admitted. Children with history of exposure are safe to discharge if they have:
  - no symptoms.
  - very transient coughing or gagging.
  - normal physical exam after 4 hours.
  - normal CXR after 6 hours.