CYANIDE POISONING

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27

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Cyanide

PROPERTIES:-

Gas / liquid/solid

Gas- hydrogen cyanide (HCN)

Liquid – prussic acid

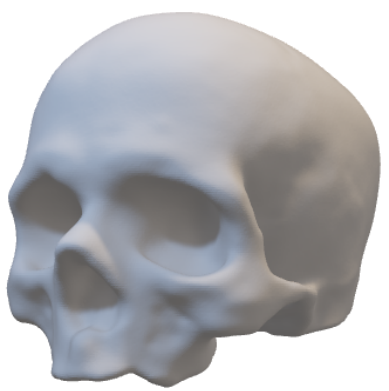
Appearance – white, crystalline powder

Odour- bitter almond smell

Taste – bitter, burning

TOXIC EFFECT:

Histotoxic anoxia by inhibiting cytochrome oxidase. Consequent reduced ATP production.



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Clinical features

- **Acute poisoning**

a) **CNS:** headache, anxiety, agitation, confusion, convulsion, coma. Pupils dilated and sluggish.

b) **CVS:** initial tachycardia and hypertension, later bradycardia and hypotension

c) **RS:** tachypnoea followed by bradypnoea

d) **GIT:** nausea, vomiting, abdominal pain

e) **SKIN:** brick red colour , cold, clammy, cyanosis is a late feature

f) **ACID-BASE:** Metabolic and lactic acidosis

Cyanide poisoning—brick red color of blood

Clinical features

- **Chronic poisoning**

a) Survivors of acute poisoning – parkinsonian symptoms, basal ganglia damage

b) Chronic exposure – headache, vertigo, dizziness, tremor, mental impairment

c) Tobacco amblyopia- progressive visual loss in heavy smokers

d) Cyanide rash – workers; electroplaters, picklers

e) Enlarged thyroid gland

f) Tropical ataxic neuropathy- tapioca in large quantities (cyanogen)

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Autopsy features

External

a. Odour of bitter almonds

b. Brick red color of skin and mucus membranes

c. Cyanosis at extremities

d. Froth at mouth, nostrils (maybe blood stained)

Internal

a. Hemorrhagic gastritis

b. Pulmonary and cerebral oedema

c. Disseminated petechiae in brain, meninges, pleura, lungs, pericardium

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Diagnosis

1. Characteristic **odour** in the vicinity of the patient.
2. **Lee-Jones** test: Add a few crystals of ferrous sulfate to 5 ml of gastric aspirate. Add 5 drops of 2% sodium hydroxide. Boil and cool. Add 10 drops of 10% HCl **Greenish-blue** colour indicates cyanide
3. Serum cyanide level
4. Laboratory findings: Laboratory tests should include CBC, arterial and venous blood gases, serum electrolytes and lactate, assessment of renal function, chest X-ray
    1. a. Serum lactate level more than 10 mmol/L.
    2. b. Elevated serum anion gap.
    3. Arterial blood gas analysis.
    4. Elevated venous oxygen saturation.
5. Cyanide and thiocyanate levels can also be measured in timed urine collections which may yield useful information on cyanide clearance.
6. ECG: Erratic atrial and ventricular cardiac rhythms with varying degrees of atrioventricular block, followed by asystole may be seen in severe cyanide poisoning. ST-T segment elevation or depression may occur.

Treatment

1. **Stabilisation:** Assisted ventilation, 100% oxygen, cardiac monitoring, IV access, treatment of metabolic acidosis, vasopressors for hypotension.
2. **Decontamination:**

a. Cutaneous exposure—remove clothing and wash skin with soap and water.
b. Ingestion—stomach wash (with 5% sodium thiosulfate solution), activated charcoal. Emesis is not recommended due to rapid progression and potential for early development of seizures, coma, or apnoea. Absorption of cyanide is rapid and charcoal may only be beneficial if administered immediately after ingestion.

ANTIDOTES:

Nitrites induce methaemoglobinaemia which causes the detachment of cyanide from the haeme group of cytochrome oxidase.

sodium thiosulfate: It enables the enzyme rhodanese to catabolise cyanide to non-toxic thiocyanate which is excreted in the urine.

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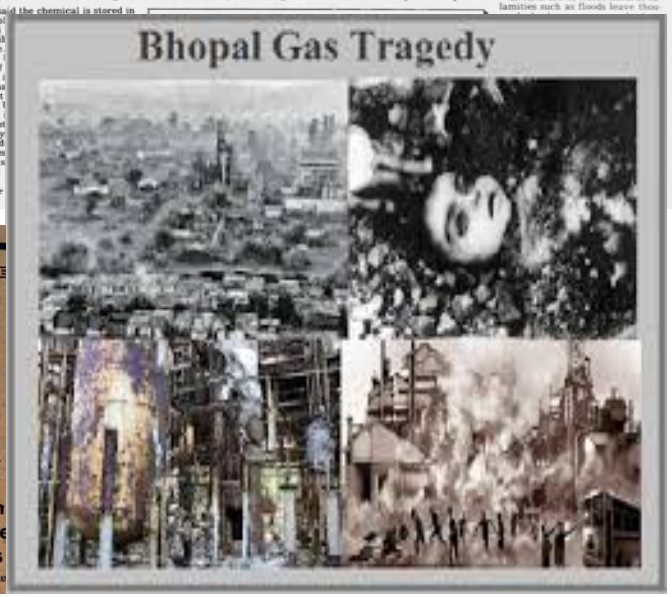
By Jonathan Broder
Chicago Tribune
BHOPAL, India — A day after the devastating Union Carbide gas leak in this central Indian city, the bodies of hundreds more victims accumulated at the hospital morgue as doctors struggled desperately to save thousands of people critically injured in the world's worst gas poisoning.
Hospital officials here, placing the death toll so far at more than 1,000, said they expect it to climb even higher. United News of India said its reporters counted 1,200 dead.
Doctors said as many as 200,000 people were affected by the gas, and added 20,000 may suffer serious after-effects. He said some may lose their eyesight, and some women may not be able to bear children.
The cloud of deadly methyl isocyanate gas leaked from Union Carbide Corp.'s pesticide plant early Monday, poisoning in varying degrees some 200,000 people over 25 square miles.
Even in India, where natural calamities such as floods leave thou-


Bhopal Gas Tragedy

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