



TOXIC GASES

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Poisonous Gases

- Irritant Gases- causes irritation of the respiratory tract
- Simple Asphyxiants- interferes with gaseous exchange
- Clinical Asphyxiants- Are absorbed into the lungs and causes various actions

Ammonia and chlorine

- Causes burns
- Mostly accidental
- Features
 - Burns
 - Laryngeal oedema
 - Tracheitis /bronchitis
 - Pulmonary oedema
 - Pneumonia

CARBON DIOXIDE

- Simple asphyxiant gas
 - Sources-
 - Anaesthesia
 - Industrial- eg. Mines, disused wells, pits,
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CLINICAL FEATURES

- Normal levels- 0.3%
- > 3% - Headache, drowsiness, dizziness, giddiness, muscle weakness
- 10% - loss of consciousness
- 25-30% - minimal fatal concentration
- 60- 80% Instant collapse and death

CARBON MONOXIDE

- It is odourless
- combines with haemoglobin to form carboxy-haemoglobin
- The affinity of CO for Hb is more than Oxygen

SOURCES

- Coal gas
- Exhaust fumes of motor vehicles and other engines
- Incomplete combustion in closed surroundings
- Industrial gases
- Circumstances : Suicidal and accidental

CLINICAL FEATURES

- The symptoms depends on the blood concentration of CO
- Up to 20% - no symptoms
- 3%- street cleaners, traffic policemen
- 5%- heavy smokers

CLINICAL FEATURES

- 20% - Headache, dizziness and malaise
- 30% - giddiness & mild shortness of breath
- 40% - Confusion, in-coordination, staggering, fatigue of muscles

CLINICAL FEATURES cont.

- 50%- drunken gait, slurred speech, incoordination, exhaustion, vomiting, flushing, sweating & pink colour of skin
- 60% - respiratory distress, dilated pupils, loss of consciousness
- 70% - coma & death

DIAGNOSIS

- History of exposure
- Pink colour
- Clinical features
- Blood analysis(5-10ml of blood)



AUTOPSY FINDINGS

- Pink colour of the skin, hypostasis, blood and internal organs
- Symmetrical softening of the basal ganglia
- Hypostatic pneumonia (delayed death)



CYANIDE

■ SOURCES

□ Cyanide Gas

- Fumigation of ships
- Spraying in fruit orchards

SOURCES

□ Cyanide salts

- electroplating, gold plating, photography & engraving
- Laboratory use
- Cyanide capsules

□ Cyanogenic Glycosides in plant material

CIRCUMSTANCES OF POISONING

■ SUICIDE-

- cyanide capsule
- jewellery/electroplating trade
- laboratory workers



■ ACCIDENTAL

- Faulty fumigating techniques
- Laboratory accidents
- Plant material

■ HOMICIDAL

- Introduced into food or drink
- War gas in world war 1
- Gas chambers in world war II
- Execution by cyanide gassing/ingestion (USA)

ACTIONS OF CYANIDE

■ TWO FOLD ACTION

- Inhibits the enzyme Cytochrome Oxidase
- Acts as a corrosive

ACTION OF CYANIDE cont.

- cellular poison
- strong affinity between cyanide and cytochrome oxidase
- Interfere with cellular utilization of oxygen
- Cause cellular anoxia- Histotoxic or cytotoxic anoxia

CLINICAL FEATURES

■ SMALL DOSES

- Vertigo, headache, difficulty in breathing, loss of muscle power & giddiness

■ LARGE DOSES

- Rapid loss of consciousness, collapse, twitching, convulsions & death

DIAGNOSIS

- History
- Clinical features
- Pink colour of extremities
- Smell of bitter almonds in the breath

AUTOPSY FINDINGS

- Red colour of skin, hypostasis, blood and vascular organs
- Odour of bitter almonds
- Red mucosa of the GIT
- Remnants of the capsule with cut injuries in the mouth

AUTOPSY FINDINGS cont.

- Embalming with formalin will rapidly destroy cyanide
- Postmortem decomposition produce traces of cyanide

Metallic Poisons

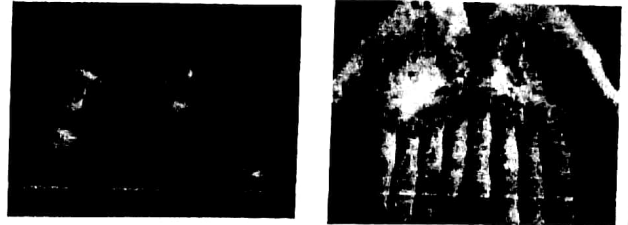
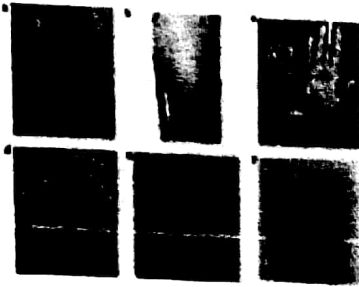
- Arsenic
- Salts are poisonous
- Sources
 - Rodenticides, weedicides
 - Paint industry
 - Wall papers
 - Contaminated drinking water

- Action
- Local
- Systemic – inhibits sulphydrine enzyme system
- Stored in liver, kidney, bone, hair, nails

Clinical features

- Cardiac toxicity
- GIT symptoms
- Wasting
- Pigmentation
- Hyperkeratosis
- Brittle nails





Lead poisoning

- Metal and salt are poisonous
- Circumstances –accidental

- Sources
- Medicinal- local sedation, abortion
- Domestic – cooking utensils, toys, crayons
- Industrial – printing and enamel industry
- Environmental



- Action
- 20 % retain in the body
- In erythrocytes, growing end of the bones



- Features
- GIT symptoms
- Blue line in gums

- CNS
- Confusion
- Convulsions
- Neuropathy- wrist drop, foot drop



Summery

Gases

- ☐ Irritant Gases-
- ☐ Simple Asphyxiants-
- ☐ Clinical Asphyxiants-

■ Metals

- ☐ Arsenic
- ☐ Lead

Thank you