

Spinal Poisons:

Strychnos nux vomica

Cuscuta

Conium maculatum (hemlock)

ISHITA
KANODIA

Strychnos Nux Vomica:

- Strychnine (Kuchila) → powerful alkaloid obtained from the seeds of *strychnos nux vomica*.
- Seeds contain 2 principle alkaloids — strychnine — brucine.
- Strychnine: colourless, odourless, rhombic prisms, intensely bitter taste.

Absorption & Excretion:

- all mucous membranes absorb strychnine
 - taken up by liver & muscles → released again into bloodstream or destroyed
- ↓
- convulsions on 2nd/3rd day of poisoning

Action: strychnine competitively blocks ventral horn motor neuron postganglionic receptor sites in the spinal cord & brainstem → inhibition of action of glycine (inhibitory neurotransmitter) → widespread 'release' excitation

Signs & Symptoms: seeds if swallowed uncrushed ⇒ no toxic action.

- bitter taste in mouth
- sense of uneasiness & restlessness
- feeling of suffocation & fear
- difficulty in swallowing
- convulsion (prodromal symptoms preceding convulsions ⇒ ↑ acuity of perception, ↑ rigidity of muscles, muscular twitchings)
 - ↓
 - first clonic, eventually tonic.
- sometimes ⇒ spasm of abdominal muscles may bend the body forward (emprosthotonus) or to the side (pleurosthotonus)
- risus sardonicus
- mouth covered with blood-stained froth
- opisthotonus (body arches in hyperextension)

- in fatal cases \Rightarrow convulsions rapidly succeed one another & \uparrow in severity & duration \rightarrow death due to hypoxia causing medullary paralysis.

Fatal Dose: 50 - 100 mg (1 crushed seed)

Fatal Period: 1 - 2 hrs.

Treatment:

1) Effective control of convulsions

- patient should be kept in a dark room, free from noise & disturbance
- 0.1 - 0.5 mg/kg i.v. slowly diazepam
- phenobarbital i.v.
- if these are ineffective \Rightarrow consider general anaesthesia &/or muscle relaxation with succinylcholine / curare / gallamine / pancuronium.

2) Short-acting barbiturates (pentobarbital sodium / sodium amytal) \Rightarrow antidotes to strychnine

\Rightarrow 0.3 - 0.6 g i.v.

3) Wash the stomach with warm water & dilute solution of KMnO_4 , & then introduce a suspension of activated charcoal (tannic acid may be used if activated charcoal is not available).

4) Acidification of urine.

5) General symptomatic management.

PM Appearances: early appearance of rigor mortis

- \rightarrow there may be signs of asphyxia.
- \rightarrow extravasated blood in muscles.
- \rightarrow haemorrhages under the peritoneal coat of the stomach.
- \rightarrow lungs, liver, kidneys, brain, spinal cord \Rightarrow congested.

Physiological Test: injection of aqueous solution of the suspected material into dorsal lymph sac of a frog → tetanic convulsions in a few minutes → strychnine ✓.
(later ⇒ stimulation of the frog produces convulsions).

Circumstances of Poisoning:

- 1] sometimes used for homicide as alkaloid or powdered nux vomica seeds.
- 2] Suicide is rare (because of painful death).
- 3] Accidental deaths are more common.
- 4] Sometimes ⇒ seeds are used as arrow poison to kill cattle.
- 5] Sometimes taken as an aphrodisiac.

| | strychnine Poisoning | Tetanus |
|--------------------|--|---|
| History | No history of injury | History of injury present |
| Onset | Sudden | Gradual |
| Convulsions | All muscles of the body are affected at a time | All muscles are not affected at a time |
| Lower jaw | Does not specifically affect or start in the lower jaw | Usually starts in, & especially affects lower jaw |
| Muscular condition | Between convulsions ⇒ muscles are completely relaxed | Between convulsions ⇒ muscles are slightly rigid |
| Fatal period | 1-2 hours | > 24 hours |
| Chemical analysis | Strychnine found | No poison found |