

Acute ingestion of inorganic arsenic salts produces severe GI symptoms that may progress to hypovolaemic shock, arrhythmias and multi-organ failure

Toxicity / Risk Assessment

- Inhalation: arsine gas is highly toxic
- Ingestion: Inorganic arsenic such as trivalent arsenic (arsenite) and pentavalent arsenic (arsenate) are highly toxic
- Consumption of organic arsenic contained in seafood may lead to raised arsenic concentrations, but rarely causes toxicity

Clinical features:

Acute: severe watery diarrhea, vomiting, GI hemorrhage, hypersalivation, \uparrow QT, arrhythmias, seizures, encephalopathy

Chronic: abdominal pain, diarrhea, ascending motor neuropathy, peripheral neuropathy (glove-stocking distribution), cutaneous lesions (hyperkeratosis, rain-drop hyperpigmentation, Mee's line), bone marrow/renal/liver failure

Sources:

- Natural aquifers, contaminated ground water
- By-product of smelting and semiconductor industries
- Agricultural pesticides, herbicides, fungicides
- Complimentary ayurvedic medicine (kelp)

Management (*discuss all acute exposure with a clinical toxicologist*)

- Aggressive fluid replacement/resuscitation and chelation therapy are the mainstay of treatment
- Cardiovascular monitoring, optimize serum Ca^{2+} , K^+ , Mg^{2+} concentrations
- Ensure a good urine output (arsenic and arsenic-chelator complexes are excreted in the urine)

Decontamination:

- Remove clothing (place in plastic bag), decontaminate by washing with soap and water
- The use of GI decontamination should be discussed with clinical toxicologist

Investigations:

- Serum arsenic concentrations are unlikely to be available rapidly enough to guide acute Rx
- In suspected acute exposure, a raised spot urine arsenic concentration may aid diagnosis
- Chronic arsenic poisoning is diagnosed using a 24-hour urinary arsenic collection (>50 ug/L OR 100 ug/g creatinine OR 100 ug total arsenic) in conjunction with clinical findings
- Arsenic speciation can be helpful (organic vs inorganic forms)
- Chronic exposure: basophilic stippling of RBC, \uparrow creatinine, \uparrow transaminase, \uparrow bilirubin, \downarrow haptoglobin

Chelation therapy:

- Discuss all cases with a clinical toxicologist
- DMSA may be indicated in patients with symptoms of chronic toxicity and a raised 24-hour urinary arsenic concentration
- IM British Anti-Lewisite (BAL) may be beneficial in acute toxicity (discuss with clinical toxicologist)