

Metal Toxicity

Part -1



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Metal Toxicity



Metal toxicity:

- **metal toxicity** is the toxic effect of certain metals in certain forms and doses on life.
- Some metals are toxic when they form poisonous soluble compounds.
- The power of toxicity differ from metal to metal
- The toxicity of metal increases with the increase in atomic number and electro positivity.

Metal Toxicity



Metal Toxicity;

- Apart from Allergies, repeated long-term contact with some metals or their compounds may even cause cancer.
- Heavy metals become toxic when they are not metabolized by the body and accumulate in the soft tissues
- Mental disorders
- Pain in muscle and joints

Metal Toxicity



Metal toxicity(contd....)

- Gastro intestinal disorders
- Vision problems
- Chronic fatigue
- Susceptibility to fungal infections

Condition of metal toxicity :

Metal toxicity is produced under following conditions-

Metal Toxicity



Condition of metal toxicity (contd...)

- When an organism gets exposed to an excessive concentration of a metal over a long period of time
- When the metal is in an unusual chemical form.
- When the metal is consumed by an organism by way of an unusual route of entry.

Metal Toxicity



Sources of pollution from Hazardous metals:

- Natural Sources
- Anthropogenic Sources

Natural Sources:

- Seepage from rock
- Volcanic Activity
- Forest Fire
- These toxic elements enter the human body mostly through Food and Water

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Anthropogenic sources:

- Industrial effluents
- Use of fertilizers
- Refuse burning
- Transport
- Power generation

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Important toxic metals:

Arsenic

Aluminium

Cadmium

Copper

Chromium

Lead

Mercury

Manganese

Zinc

Nickel

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Toxicity of heavy metals:

Most common heavy metals

- lead (Pb)
- mercury (Hg)
- cadmium (Cd)
- arsenic (As)
- They are mainly produced by industrial activities, and deposit slowly in the surrounding water and soil.

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Toxic effect of some heavy metals:

Arsenic:

- Arsenic is the most common cause of acute heavy metal poisoning in adults
- Arsenic is released into the environment by the smelting process of copper, zinc, and lead, as well as by the manufacturing of chemicals and glasses.
- People can be exposed to arsenic by inhaling it, by consuming contaminated foods, water, or beverages, or by skin contact.
- People may be exposed to higher levels if they live near industrial areas.

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Arsenic(contd....)

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Toxicity:

Excessive contamination of ground water in the Bengal delta basin, causing carcinogenic toxicity to millions of people.

Metal Toxicity



Toxicity(contd....)

- Arsenic exerts its toxic action by attacking –SH group of an enzyme, thereby inhibiting enzyme action.
- It also prevents the generation of ATP.
- The major action of arsenic is coagulation of protein, complexation with coenzyme and uncoupling of phosphorylation.
- Brown et al. revealed that arsenic affects mitochondrial enzymes and impairs tissue respiration.

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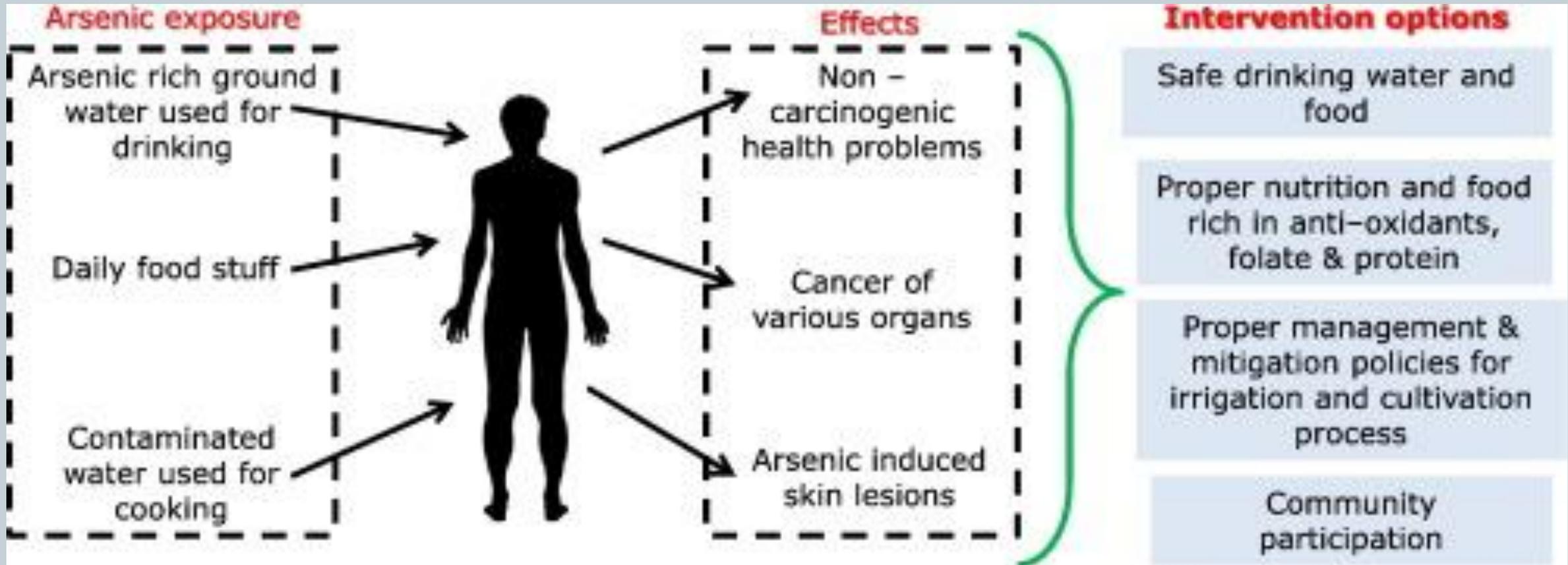
SYMPTOMS

- Vomiting
- Abdominal Pain
- Diarrhea
- Dark urine (termed black water urine)
- Dehydration
- Cardiac problems
- Hemolysis (destruction of red blood cells)
- Vertigo
- Delirium
- Shock
- Death

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Metal Toxicity-Arsenic Poisoning



Thank You

