





































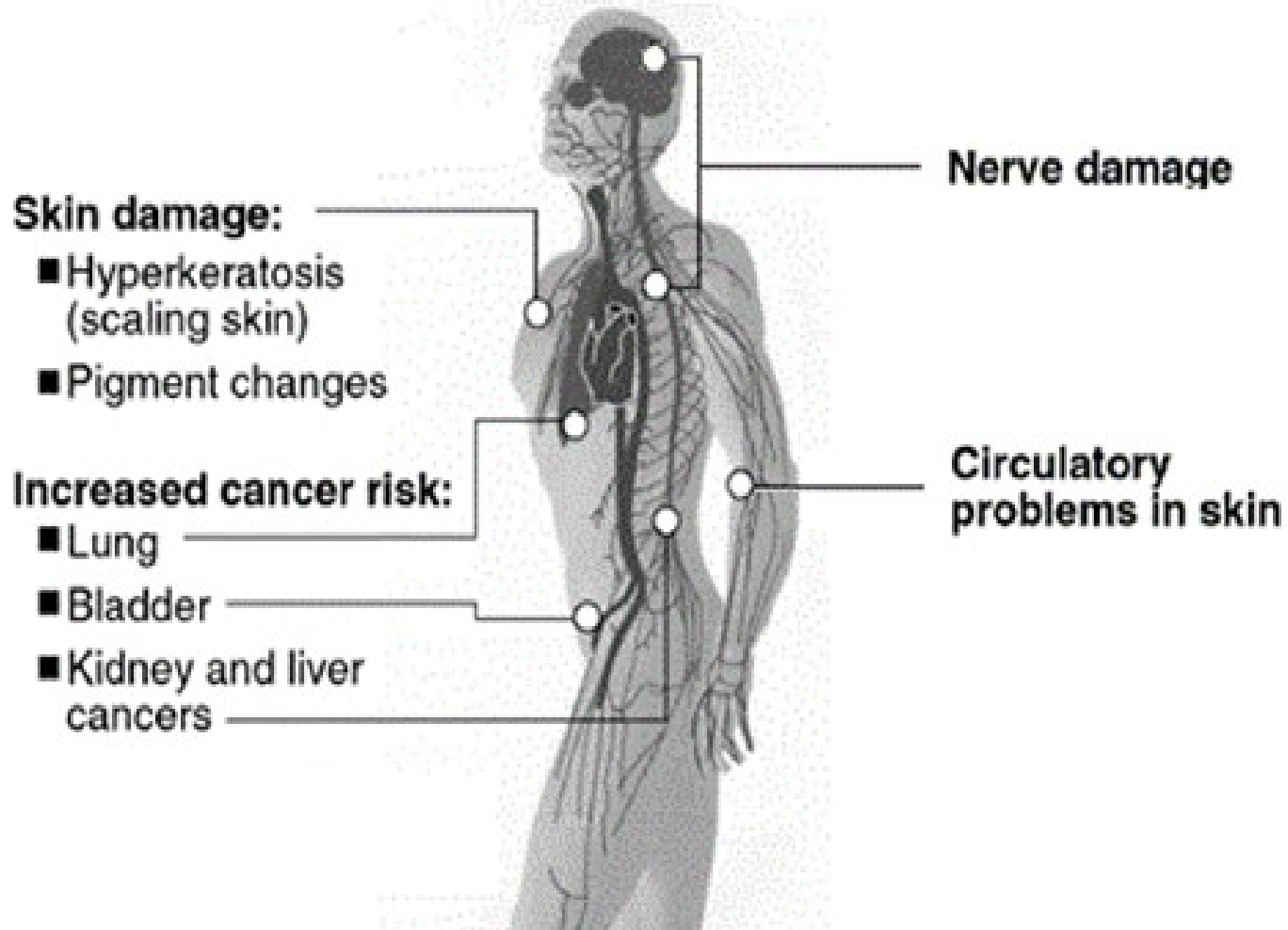
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Arsenic poisoning



Sources of arsenic poisoning

These include:

Contaminated drinking water (as above).

Some ayurvedic medicines.[Some Chinese herbal medicines. Both as intended ingredient and as contaminant.

Pesticides,[herbicides and fungicides - no longer licensed in the UK.

Wood preservatives.

Ceramic enamels.

Paints.

Tobacco (there may be as much as 6 micrograms (mcg) per pack).

Burning of fossil fuels - arsenic is a contaminant.

In the USA, illicit whiskey ('moonshine').

Occupational exposure[9]

This can occur in:

The smelting and plating industries: arsenic is a byproduct of ores containing lead, gold, zinc, cobalt and nickel.

The microelectronics industry: gallium arsenide is used in some semi-conductor computer chips.

Coal power plants.

Manufacture of glass and fireworks.

Use of pesticides.

Contact with wood treated with arsenic as a preservative.

Main clinical features and possible complications

Skin lesions:

Skin lesions are the most common effect of chronic exposure.

They typically start about ten years after first exposure.

Keratosis on the palms and soles are characteristic.

Mees' lines (transverse white lines on nails).

Hyperpigmentation (especially on the arms and upper chest) - diffuse dark areas or 'raindrop' pigmentation.

Also, exfoliative dermatitis, alopecia, conjunctivitis, corneal ulceration.

GI:

Anorexia, weight loss, abdominal pain, diarrhoea.

Jaundice, hepatomegaly; development of portal fibrosis and cirrhosis.

Cardiac/respiratory:

Coronary heart disease, increased further in those who also smoke.

Myocarditis, pericarditis.

Hypertension.

Peripheral arterial disease.

Restrictive or obstructive lung disease.

Effects in children are seen after an average of seven years of exposure.

Haematological:

Pancytopenia,

Aplastic anaemia.

Neurological:

Peripheral neuropathy (sensory and motor at 1-3 weeks).

Muscle fasciculation and wasting.

Ataxia.

Diabetes - increased risk.

Cancer - increased risk of cancers:

Basal cell carcinoma and squamous cell carcinoma of the skin.

Lung.

Bladder and kidney.

Possibly also lymphoid, laryngeal and liver.

Management of chronic arsenic poisoning

Provide arsenic-free drinking water, to reduce the risk of further disease developing. Anecdotal evidence suggests that mild-moderate keratoses may improve with cessation of exposure.

Chelation therapy may have a role but its effectiveness is uncertain. Also, it is of no use if exposure to arsenic continues.

Micronutrients and antioxidants may be beneficial, especially in undernourished populations. It is recommended that all patients with skin lesions be given multivitamins.

Certain plant compounds may help to remove arsenic from tissues.

Skin care for keratoses and any associated bacterial or fungal infections.

Screen and treat for complications - eg, diabetes, hypertension.

Other household members:

Check other members of the family, as they may also have been exposed.

Pregnancy and breast-feeding: arsenic is probably transferred to the baby via the placenta and breast milk.

Prevention

Test all groundwater sources of drinking water for arsenic.

Provision of uncontaminated water for all is essential.

WHO guidelines advise that a value of <10 mcg/L of arsenic in drinking water is a realistic target but with the proviso to keep concentrations as low as possible. Techniques do exist to remove arsenic to levels of <5 mcg/L but this is not thought currently to be a reasonable expectation.

Phytoremediation: some plants, notably the Chinese brake fern (*Pteris vittata*), have the ability to remove arsenic from the environment.

Rainwater harvesting is an alternative in Bangladesh, which has high annual rainfall; however, it is not without risks of bacterial contamination.