

# Effects of exposure to mercury and arsenic

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The effects of mercury and arsenic toxicity can be contrasted and distinguished by observation of the constellation of symptoms which are idiosyncratic even though they are both heavy metals. Mercury has the zero valent state  $Hg_0$  and the reduced form in the body  $Hg^{2+}$  while arsenic exists in the zero, tri- and penta-valent states  $As_0$ ,  $As^{3+}$  and  $As^{5+}$  respectively (Lauwerys, 1983). Mercury has a predilection for the central nervous system and especially the brain, in the body mercury is in the form of methyl mercury ( $CH_3-Hg$ ) and combines with the sulfhydryl group ( $-SH$ ) of cysteine. It forms a complex which resembles methionine and gets transported into the brain using the methionine transporter (molecular mimicry). The elemental arsenic ( $As$ ) is not poisonous, while trivalent arsenic ( $As^{3+}$ ) is readily soluble and very poisonous in the human body affecting organ systems and having very adverse effects, especially on the liver. The penta valent form of arsenic ( $As^{5+}$ ) is not readily soluble and is not known to be as poisonous to the body as the trivalent form. Arsenic accumulates in the hair, nails and skin and is excreted via urine, while methyl mercury is excreted via biliary excretion. Arsenic causes peripheral vascular disturbances, it brings hemolytic anemia and the lysed red blood cells lead to renal failure by blockage of renal tubules. Symptoms of mercury toxicity: In the central nervous system - causes tremors, hyper excitability and decreased nerve conduction.

Pulmonary system - dyspnea, bronchitis and pneumonitis.. Mercury is reputed to have caused " the madhatters disease", the Minamata disease and acrodynia which presented with personality changes, insomnia, irritability, apathy, photophobia with feet becoming cold, moist, painful and

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swollen (Lauwerys, 1983). Symptoms of arsenic toxicity: I. Peripheral vascular disturbances due to decreased production of white blood cells and red blood cells are damage to blood vessels. The disturbed erythropoiesis causes anemia.

II. Hepatomegaly. III. Peripheral neuropathy(sensory and motor) - auditory deficits. IV. Anorexia.

V. Diarrhea. VI. Arrhythmia.