



Neurotoxicity of Heavy Metals

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ABSTRACT: Environmental components including both biotic and abiotic factors are highly threatened by the heavy metal toxicity. Heavy metals are considered to be the major environmental pollutants. They mainly cause river water pollution as the industrial and the municipal wastes are directly discharged into water bodies without proper treatment. To a small extent these heavy metals also enter the human body through various sources like food, drinking water and air. Normally these metals when present in the body below a required concentration don't play any biological role but when their concentration increases, they interfere with the metabolic processes. Metal toxicity depends upon the route of exposure, dosage of heavy metal and duration of exposure i.e. acute or chronic. Metals like aluminum (Al), arsenic (As), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg) and thallium (Tl) are known to be neurotoxic and affect the central and peripheral nervous system. Some of the metals like cadmium (Cd), chromium (Cr), lead and mercury are considered to be carcinogen affecting human health through occupational and environmental exposure. The mechanism by which they act is to increase the levels of free radicals also known as reactive oxygen species (H_2O_2 , O^{2-}) and create an imbalance between the level of oxidative stress and the release of various antioxidants in the human body. This further causes DNA damage and protein modification thus causing cancer and other neurodegenerative diseases like Alzheimer's and Parkinson's disease. They also cause impairment of the signaling pathways and thus lead to cell death and apoptosis. The metal toxicity can be treated using chelation therapy in which certain chelators like dimercaprol, DMSO or EDTA can be used and remediation techniques involved are of three types i.e. physical methods (soil washing, soil vapor extraction), chemical methods (thermal methods, electro kinetics) and bioremediation involving bioaugmentation and mycoremediation can also be used. © 2016 iGlobal Research and Publishing Foundation. All rights reserved.

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