

Contamination of Environment by Lead: A Threat to One Health

Subrat Kumar Dash*

Assistant Professor (Veterinary Biochemistry), Department of Veterinary Physiology and Biochemistry, College of Veterinary Science, Guru Angad Dev Veterinary and Animal Sciences University, Rampura Phul, Bathinda, Punjab, India

***Corresponding Author:** Subrat Kumar Dash, Assistant Professor (Veterinary Biochemistry), Department of Veterinary Physiology and Biochemistry, College of Veterinary Science, Guru Angad Dev Veterinary and Animal Sciences University, Rampura Phul, Bathinda, Punjab, India.

Lead is one of the highly toxic environmental pollutants. Contamination of our environment by lead is mainly due to human and industrial activities. The toxic effluents from various industries release lead to the environment because of poor or non-functional waste management system. Rules regarding waste treatment and management are made only for showing purpose and industries are hardly following these rules. As a result we, the human (creator of this problem) along with animals, plants, fresh water and marine life along with other living organisms in the environment are now facing the dangerous effects of lead. It is now a “one health issue” (Figure 1).



Figure 1: Lead- a threat to one health.

Received: July 14, 2021

Published: July 29, 2021

© All rights are reserved by **Subrat Kumar Dash.**

Lead gets accumulated in various concentrations in soil and water. Crops, vegetables, fodder, different plants and fishes acquire the contamination from water and soil. Human and animals get contaminated by lead through environmental sources either by direct and indirect exposure. Drinking water is also a major source of exposure to lead in human and animals. The overall effect of lead exposure is damage to human, animal and environmental health. Lead causes different biochemical, immunological and reproductive disturbances in human and animals. Lead can trigger hematological, circulatory, renal, hepatic, neurological, immunological and reproductive dysfunctions along with different types of cancers. Lead also affects the ovarian function and hormone systems [1-4]. The exact biochemical mechanisms of different adverse health effects due to lead exposure are still unclear. Lead is pro-oxidative, hence generation of reactive oxygen species (ROS) and oxidative stress may play a major role in the pathogenesis due lead exposure [5]. ROS reacts with cellular biomolecules and induce lipid peroxidation, membrane protein and DNA damage along with many more damage to the cellular system. This might leads to the disruption in antioxidant system of body which serve as the main source of protection against the free radicals [6]. Several functions of the immune cells of body such as clonal expansion, B- and T-cell activation, proliferation, antibody production and apoptosis are under the influence of intracellular oxidant-antioxidant status. However, overproduction of oxidants and disrupted antioxidants due to lead exposure may alter the immune cell's function causing immunodeficiency, adversely affecting the health.

Poorly understood biochemical mechanisms of lead mediated adverse health effects in animals and human is a hindrance in

the development of suitable therapeutic and chelating strategies. Hence, in depth study is necessary to explore the mechanism of lead mediated adverse health effects which will be the pillar for development of potential therapeutics against lead associated diseases or disorders in human and animals.

Bibliography

1. Patrick L. "Lead toxicity part II: the role of free radical damage and the use of antioxidants in the pathology and treatment of lead toxicity". *Alternative Medicine Review* 11 (2006): 114-127.
2. El-Nekeety AA., *et al.* "Protective effect of *Aqualegia vulgaris* (L.) against lead acetate-induced oxidative stress in rats". *Food and Chemical Toxicology* 47 (2009): 2209-2215.
3. Mohajeri G., *et al.* "Changes in blood metals, hematology and hepatic enzyme activities in lactating cows reared in the vicinity of a lead-zinc smelter". *Bulletin of Environmental Contamination and Toxicology* 92 (2014): 693-697.
4. Dash SK., *et al.* "Adverse effects of environmental lead exposure on hepatic, renal and thyroid function of buffaloes". *Indian Journal of Animal Research* 53 (2019): 1162-1166.
5. Flora G., *et al.* "Toxicity of lead: a review with recent updates". *Interdisciplinary Toxicology* 5 (2012): 47-58.
6. Valko M., *et al.* "Metals, toxicity and oxidative stress". *Current Medicinal Chemistry* 12 (2005): 1161-1208.

Volume 3 Issue 8 August 2021

© All rights are reserved by Subrat Kumar Dash.