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Impact of metal-loaded industrial dust on the physiology of a model experimental animal

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Industrial polymetal dust is a widespread urban pollutant of great concern to human and animal health due to its combined metal toxic action. Yet, this potential pollutant has not been given considerable attention in animal research. In this study, adult male and female rats, *Rattus norvegicus*, were fed a daily intraoral 2 mL supply of either a lower or a higher dose of industrial dust (0.001 and 0.002 Kg^{-1} body weight, respectively) for 60 days in a lab controlled experiment. Dust was collected from filters of a concrete block factory, in which Portland cement is used in manufacturing processes. Data showed elevated levels of Cd, Pb and Zn in liver and kidney tissues of both experimental groups with a more pronounced effect in the rat group given the lower dose. Non significant differences were found in both groups in some red blood cell indices referring to potential detoxification pathways. The leucocytosis observed in rats of intoxicated groups might imply susceptibility to infection and an increase in leukocyte mobilization. The reduced activities of the serum enzymes alanine aminotransferase, aspartate aminotransferase and alkaline phosphatase in rats treated with both doses suggest enzyme inhibition rather than leakage of enzymes from the cell into the extracellular space. The conclusion driven in this study suggesting adverse effects of concrete dust on the physiology of albino rat with, particularly in lower-dose animals, was attributed to more than one mechanism.

Biography

Khadiga G Adham obtained her PhD Degree from the Faculty of Science, Alexandria University, Egypt, where she was appointed Assistant, Associate and then full Professor of Physiology. During her academic career, she got two postdoctoral fellowships to Northeast Wales Institute of Higher Education, UK, and College of William and Mary, VA, USA, and has published more than 40 papers in reputed journals. She is now on secondment as Professor of Physiology, Zoology Department, College of Science, King Saud University, Saudi Arabia.

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