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Co-treatment with selenium and zinc: A probable therapy against cadmium toxicity

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Abstract

Cadmium (Cd) is an environmental pollutant of worldwide concern. It is highly toxic and has even been considered as a human carcinogen. Although Cd induced toxicity has been largely investigated, no efficient remedy exists to treat Cd poisoning. The heavy metal has been suggested to act, in part, by inducing oxidative stress and by interfering with essential elements. Interestingly, selenium (Se) and zinc (Zn) are Cd antagonists and well established antioxidants; however, their co-effect during exposure to Cd is rarely studied. So, we investigated whether Se and Zn have synergetic actions against Cd toxicity in *in vivo* study and in a preliminary *in vitro* study. Male rats received either Cd, Cd + Zn, Cd + Se, or Cd + Zn + Se in their drinking water, during 35 days. Organs such as the liver and kidneys were then analysed. Cd induced oxidative stress and various histological damages in the studied organs. Zn and Se-Zn supplies increased Cd-retention moreover. With Se or Zn administration during exposure to Cd, only partial corrective effects on Cd-induced oxidative stress in the studied tissues have been observed, while Se and Zn together assured a more efficient protection against the observed oxidative stress and practically prevented the morphological damages observed in the studied organs. The *in vitro* preliminary study conducted on hepato-carcinoma cell lines using Cd, Cd+Zn, Cd+Se or Cd+Se+Zn as treatments, strengthened our conclusion: selenium and zinc can act in synergy during exposure to cadmium and can have an efficient protection against its toxicity.

Biography

Jihen El Heni has received her PhD in Biology and Biotechnology in 2010 from the department of Biophysics, Medicine Faculty, University of Monastir in Tunisia. Currently she is an assistant professor in the Faculty of Sciences, Gabes. She served as an editorial board member of an international journal and is a reviewer for several international journals. Dr. Jihen has more than 10 published articles in referred journals.