Poster presentation

ENVIRONMENTALLY RELEVANT EXPOSURE TO CADMIUM AND HEALTH RISKS: SKIN AS TARGET ORGAN

Dina Tucovic[1], Ivana Mirkov[1], Jelena Kulas[1], Milica Zeljkovic[1], Dusanka Popovic[1], Lidija Zolotarevski[1], Sladjana Djurdjic[2], Jelena Mutic[2], Milena Kataranovski[1], Aleksandra Popov Aleksandrov[1]

[1]Immunotoxicology Group, Department of Ecology, Institute for Biological Research "Siniša Stanković"- National Institute of Republic of Serbia, University of Belgrade, 142 Bulevar despota Stefana, 11000 Belgrade, Serbia

[2] Innovation Center of the Faculty of Chemistry, University of Belgrade, 12-16 Studentski trg, 11000 Belgrade, Serbia

Adverse effects of non-occupational exposure to cadmium (Cd) are increasingly acknowledged. Using a rat model of oral Cd exposure in drinking water we have shown that skin is a target for this metal. Due to contribution of individual variability to the intensity of cadmium toxicity, dermatotoxicity of two environmentally relevant Cd doses (5 and 50 ppm) was examined in individuals of two rat strains, Albino Oxford (AO) and Dark Agouti (DA), which differ in response to chemicals. A dose-dependent accumulation of Cd in the skin/epidermal cells was noted in both strains, and although there were no strain differences in the Cd accumulation, the degree of skin response to the metal differed. Signs of skin damage were evident in both strains, but response to injury was more pronounced in DA. Individuals of DA rats responded by an increase in the levels of antioxidant defense enzymes in the skin already at lower dose, in contrast to AO (which reacted to higher dose solely), implying higher sensitivity of DA strain to Cd-induced toxicity. Epidermal cells from both strains developed stress response, however increased GSH, and higher metallothionein/MT-1 and MT-2 mRNA, Nrf2 protein, apoptosis, Ahr and Cyp genes in AO, depicting this strain`s ability to better defend against Cd insult. Epidermal cells` IL-1β, TNF and IL-6 response was induced by Cd in DA, while pro-inflammatory cytokine production was unchanged in AO (though increased following stimulation with *S. epidermidis*), with increased IL-10 as a possible underlying mechanism. T cells from non-exposed rats produce more IFN-γ and IL-17 in co-culture with epidermal cell from Cd–exposed DA rats what strengthens the view that this strain is more prone to metal's dermatotoxicity. These data give a new insight into repercussion of genetic variability to toxicity of cadmium acquired by the skin via gut, bearing relevance for variations in the link between dietary cadmium and inflammation-based skin pathologies.

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