Saturday, December 7th Session: MISCELLANEOUS

Poster presentation

ENVIRONMENTALLY RELEVANT EXPOSURE TO CADMIUM AND HEALTH RISKS: INVOLVEMENT OF ARYL HYDROCARBON RECEPTOR

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Cadmium (Cd) is a heavy metal widely spread in the environment and significant water and food contaminant. This metal exerts toxic effects in various tissues thus representing great threat to human health, and our previous study showed that oral consumption of Cd (in water for 30 days) increased the metal deposition and exerted immunomodulatory effects in lung leukocytes. Although the most studied mechanisms of Cd toxicity include oxidative stress and inflammation, recent studies have indicated that this metal can activate aryl hydrocarbon receptor (AHR) and exert effects on AHR-regulated genes (i.e. CYPs). AHR represents a link between environmental toxicants and immune response as high receptor expression is noted in immune cells and barrier tissues, thus the aim of presented study was to investigate if activation of AhR by Cd is associated with metals' immunomodulatory effects. Treatment of lung leukocytes with Cd *in vitro* (non-toxic doses) caused an increase in mRNA levels for AHR, CYP1B1 and CYP1A1, but co-treatment with metal and AHR antagonist CH223191 indicated that higher Cd doses (5 and 10 μM) can activate CYPs directly while a lower dose (1 μM) exerted effects on CYPs expression through activation of AHR. Low Cd dose induced increased production of IL-6 and decreased TNF and IL-1β by lung leukocytes, compared to controls. Gene expression data revealed unchanged mRNA for IL-6, decreased TNF, but increased IL-1β. Lower IL-1β protein level despite increased mRNA, was a consequence of decreased mRNA for NLRP3, a component of inflammasome that is involved in processing of pro-IL-1β in IL-1β. All noted effects were abolished in the presence of CH223191. Data obtained indicate that immunomodulatory effects of low Cd dose are mediated through AHR activation.

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