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Immunological pattern alteration in shoe, hide, and leather industry workers exposed to hexavalent chromium.

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**OBJECTIVE:** The aim of this work was to assess the effects of hexavalent chromium [Cr(VI)] on shoe, leather, and hide industry workers, based on the assumption that Cr(VI) can behave as an environmental immunological "stressor."

**METHODS:** The immunological patterns of 84 male subjects were studied in relation to Cr(VI) hematic and urinary levels. Cr(VI) was measured through atomic absorption. Lymphocyte subsets, mitogen-mediated lymphocyte-proliferation, cytokine levels, and natural killer (NK) cytotoxic activity were also assayed.

**RESULTS:** The urinary levels of the total amount of Cr(VI) were significantly higher in a subgroup of exposed subjects (group B) than in the control or in the lower exposed (group A). In group B, Cr(VI) caused a decrease in the density of glucocorticoid receptors (GR) on peripheral blood mononuclear cells (PBMC) and a increase of IL-6. Cr(VI) did not modify NK-mediated cytotoxicity, the plasmatic levels of inflammatory cytokines and related soluble receptors, and prostaglandin

levels, while it tended to increase lymphocyte sensitivity to mitogens and the production of immunomodulant cytokines (IFN-gamma, IL-4, and IL-2). The experimental addition of Cr(VI) to the in vitro lymphocyte culture determined a significant inhibition of phagocytosis percentage, index, and killing percentage.

These effects were neutralized by exogenous IFN-gamma.

**CONCLUSION:** Cr(VI) could represent an environmental immunological stressor whose effects can be evaluated through laboratory surveys. The lymphocyte mitogen-induced proliferation, GR receptor on PBMC, and IL-6 plasma levels may represent a discriminating element between Cr(VI)-induced stress and other kinds of stress.

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