

An Environmental Hazard Assessment of Low-Level Dermal Exposure to Hexavalent Chromium in Solution Among Chromium-Sensitized Volunteers

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To evaluate the potential for elicitation of allergic contact dermatitis from contact with standing water in the environment, 26 persons known to be allergic to hexavalent chromium [Cr(VI)] were exposed to 25 to 29 mg/L Cr(VI) by immersion of one arm for 30 minutes per day on 3 consecutive days in a potassium dichromate bath. Sixteen of the 26 volunteers demonstrated either no or an equivocal response to the Cr(VI) challenge. Ten of the volunteers developed a few papules or vesicles (1 to approximately 15), mild redness, and pruritus on the Cr(VI)-challenged arm. Histopathological examination of the papules revealed spongiosis and perieccrine and perivascular inflammation. The responses were diagnosed as acute perieccrine reactions. It was concluded that exposure to similar concentrations of Cr(VI) in the environment does not pose an allergic contact dermatitis hazard, even to Cr-sensitized persons.