

Identification of Unreported Sources of Objects Containing High Release Nickel

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INTRODUCTION

Globally, nickel is the leading cause of allergic contact dermatitis (ACD). Nickel is ubiquitous, and published literature continues to index items most frequently associated with Ni-ACD. Unregulated nickel exposure in North America is evident by the unprecedented rates of sensitization seen in patch-tested cohorts, 18.5% in children (ages 0-18 years) and 28.1% in adults.¹ Conservative estimates of ACD within the pediatric population suggest at least one million cases in the US yearly with roughly one-quarter of those cases due to nickel.²⁻³ The United States could potentially save \$5.7 billion annually in health care costs, extrapolating current cost-saving data from Denmark post nickel regulation, by implementing similar regulation to that of the European Union (EU).² To our knowledge, site surveys testing for items releasing nickel in public locations has yet to be performed.

MATERIAL AND METHODS

Dimethylglyoxime (DMG) spot testing was used to identify metal objects found in community facilities throughout California that released detectable nickel. These facilities included schools, libraries, grocery stores, public restrooms, and parks/playgrounds. A single drop of solution was applied to a cotton-swab, which was rubbed on metal objects for 15 seconds. A pink precipitate indicated a positive test.

RESULTS

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In the 79 different Southern California locations surveyed, 3,466 items were inventoried and categorized. DMG testing of indexed items revealed that 1,731 (49.9%) of the items in the areas frequented by children were found to be DMG positive. These included daily use items such as chairs, desks/tables, drinking fountain knobs, file cabinet handles, locker handles, and pencil sharpeners. Items consistently testing negative for nickel included trash cans, benches, shopping carts, and refrigerator door handles.

CONCLUSION

These newly identified high-nickel release items could contribute to flare-up allergy reactions in sensitized persons or potentially to sensitization itself. Additional studies are needed in other communities to show the significance of nickel contact from high traffic public areas. With the high rates of nickel sensitization, a US-based nickel release directive targeting items intended to come into direct and prolonged skin contact is needed. In the meantime, providing information to relevant audiences (parents, children, medical professional, policy makers, etc.) will help reduce exposure and occurrence of nickel sensitization and Ni-ACD.

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