

Positive Patch-Test Reactions to Platinum Are Rare

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Background: Although contact allergy to some metals is common, patch testing for allergy to platinum is rarely performed.

Objective: To determine the prevalence of positive patch-test reactions to platinum in an unselected consecutive group of patients presenting for diagnostic patch testing.

Methods: Unselected patients who presented with a possible diagnosis of contact dermatitis were tested with a series of allergens, including ammonium tetrachloroplatinate 0.25% aqueous.

Results: Of 446 patients tested, only 2 females showed positive reactions to platinum; one had no other positive reactions, and the other had reactions to other metals.

Conclusions: Positive patch-test reactions to platinum are rare. However, platinum jewelry may occasionally provoke allergic contact dermatitis.

METALS are excellent contact allergens. Allergic contact dermatitis (ACD) from platinum is considered to be rare although respiratory allergy in platinum workers is common.¹ The true level of ACD from platinum is unknown, however, because patch testing with platinum is rarely performed. We tested consecutive patients who presented for diagnosis of possible ACD with platinum.

Patients and Methods

As part of diagnostic patch testing, 446 consecutive patients were tested with a panel of allergens, including ammonium tetrachloroplatinate 0.25% aqueous (aq). All patients had presented for testing with a possible diagnosis of ACD, and none were specifically selected for any criteria relating to platinum exposure. Patch tests were applied and read according to the manner of the North American Contact Dermatitis Group.² Patches of Finn Chambers (Epitest Ltd Oy, Tuusula, Finland) on Scanpor tape (Norgesplaster A/S, Vennesla, Norway) were applied for about 48 hours, and a final reading was performed after another 48 hours. Allergens were supplied by Chemotechnique Diagnostics (Malmö, Sweden). Other metal allergens included nickel sulfate 2.5% in petrolatum (pet), cobalt chloride 1% pet, potassium dichromate

0.25% pet, palladium chloride 1% pet, and gold sodium thiosulfate 0.5% aq.

Individuals with positive or doubtful reactions to platinum were questioned about potential exposures.

Results

Of 446 patients tested, 2 (0.44%) had positive patch-test reactions to platinum and 2 had "doubtful" reactions. The positive reactions were graded + and ++; these two patients were Caucasian females. One had no other reactions to metals; the other reacted also to nickel, palladium, gold, and thiuram mix. There were 99 positive reactions to nickel (22%) and 33 positive reactions to palladium (7.4%).

Of the two doubtful reactions, no relevance was found, and these reactions are best classified as nonallergic.

The patient with a positive patch test reaction to platinum and no other reactions had dermatitis limited to the face and neck and routinely wore platinum rings on the hands. Removal of the rings resulted in improvement in the dermatitis after several months, but she was lost to follow-up beyond that time. In the other patient, dermatitis occurred on the hands and chest. The locations were consistent with areas of contact with jewelry and other metals, but she denied routine contact with platinum. The allergies to other metals were felt to be more likely related to her dermatitis. There was no occupational exposure in any of the patients with positive or doubtful reactions.

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Discussion

Metallic platinum, as used in jewelry, photography, dentistry, and the chemical and electrical industries, rarely causes contact dermatitis although ACD due to a platinum ring has been reported.³ Rhodium is often used to plate white gold and platinum, and in this instance, the platinum dermatitis occurred when the rhodium plating wore off.

Platinosis is a disease caused not by metallic platinum but usually by its complex salts, primarily chloroplatinates, and affects mainly workers in platinum-refining workshops.⁴ The cutaneous manifestations include pruritus, erythema, eczema, and urticaria, which are usually seen on the parts of the body exposed during work.

Roberts coined the term "platinosis" for the symptom complex produced by platinum and its salts.⁴ He scratch-tested 60 platinum workers with aqueous solutions of sodium chloroplatinate. He found that all subjects developed a + reaction with a 1:10 dilution of the salt and that, following the onset of symptoms (of either the cutaneous or the respiratory type), a reaction was obtained with a 1:1,000 dilution. Roberts decided that initial scratch-test results were an unreliable index of liability to develop future symptoms, and he claimed that atopic individuals were more likely to develop platinosis than were others.

Baker and colleagues reported that 15 of 107 platinum refinery workers had positive skin-prick test results with platinum.¹ Five of these workers had dermatitis. The researchers tested with disodium hexachloroplatinate and ammonium hexachloroplatinate at concentrations of 0.1 to 0.000001%. Thirty-nine control subjects had negative results. Occupational allergy to platinum has also been reported in a chemist and in a production worker exposed to the drug cisplatin.^{5,6}

Santucci and colleagues reported that of 800 consecutive patients, none reacted to platinum on either patch or prick testing.⁷ In contrast, they further reported four positive patch-test reactions in a group of 153 platinum refinery workers. Twenty-two of the workers had positive prick-test reactions, further confirming that immediate hypersensitivity and respiratory symptoms are more common manifestations of platinum allergy.

Complex salts of platinum are not readily soluble in distilled water, but solubility is improved if physiologic saline is used. Because of the lack of work on platinum in dermatologic allergy, it is not clear what constitutes an appropriate concentration for patch testing. Commercially available platinum allergens include ammonium hexachloroplatinate 0.1% aq and ammonium tetrachloroplatinate 0.25% aq.

In a study with mice, ACD was easily induced by repeat applications of sodium hexachloroplatinate (Na_2PtCl_6) 5% in acetone. This solution, however, caused a local irritant reaction on application. Sensitization was documented 6 days later with a 2% solution.⁸

Conclusion

The findings in this study substantiate the theory that allergic contact dermatitis from platinum is rare. Routine patch testing with platinum allergens is not likely to be useful. However, adding platinum to a testing series may be helpful when allergy to fine jewelry is suspected and when facial dermatitis is seen in a patient who wears platinum jewelry.

References

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