

Late reactions to beryllium: report of two cases

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Case Reports

Patient no. 1

A 10-year-old girl was referred with eczematous areas where she wore jewellery. She was patch tested with the Spanish baseline series (Chemotechnique, Malmö, Sweden) and a metal series (Marti-Tor, Barcelona, Spain) using Finn Chambers (Epitest Ltd Oy, Tuusula, Finland) on Scanpor tape (Alpharma Norgesplaster AB, Vennesla, Norway). Patch tests at D2 and D4 showed positive (++) reactions to nickel sulfate 5% pet., palladium chloride 2% pet., and gold sodium thiosulfate 2% pet. The patient returned at D15 because her mother had noticed an erythematous lesion on her back where the metal series had been applied. Subsequent patch testing with the metal series gave a +++ reaction at D2/D4 to beryllium chloride 1% pet. only.

Patient no. 2

A 25-year-old man presented with a 2-month history of generalized eczema that started on his feet. He was patch tested as above together with additional rubber allergens. Readings on D2 and D4 showed positive (++) reactions to the carba mix 3% pet. He returned 1 month later and was found a reaction on his back corresponding to the area of the metal series. Re-patch testing with the metal series gave a positive reaction (++) to beryllium chloride 1% pet. at D2 and D4.

Discussion

Beryllium is a metal used in the manufacture of alloys for electrical

equipment and pottery, it forms part of the cathode of some treatment apparatus, and it is found in the manufacture of some fluorescent lights. In dental prostheses, it is used to refine the granular structure and improve the behaviour of the metal alloys during casting (1). It is a reactive metal that combines with tissue protein to produce a complete antigen (2). The insoluble form may cause granulomas, while the soluble salts can cause contact sensitization; it has been described as a moderate sensitizer according to the Magnusson and Kligman maximization test (2).

There are reports of both gingivitis and stomatitis from dental metals (3–5) and hand eczema in a dental technician (3). Contact sensitization was also reported to follow an orthopaedic implant, but a causal relationship was not proved (3).

The metal series (Marti-Tor[®]) utilized by us includes beryllium chloride at 1% pet. We use it for cases of suspected contact dermatitis from surgical or oral prostheses and in occupations that come into contact with them (3, 4). To the best of our knowledge, although this series has been used for several years, these are the first two cases reported of late reactions to beryllium.

A late reaction has been defined as a reaction that is noticed at least 10 days after the application of the test and that was negative at the last test reading on D4–D6 (6). Active sensitization is one possible explanation for a late reaction; this is a negative patch test reaction followed by a flare-up after 10–20 days and a positive reaction occurring within few days of retesting with the allergen in question (7). It is very difficult to determine whether a late reaction is actually caused by active sensitization. True late reactions from several allergens have been reported; patch test reactivity may fluctuate considerably on subsequent testing due to technical and immunological reasons, and positive reactions that represent cross-allergy may also appear late and the true allergen may even remain unknown (6, 7).

Late reactions and active sensitization may be under reported because routine readings are not normally performed after D4–D7 unless the patient reports a new reaction. In a recent study in the Finnish Institute of Occupational Health (FIOH), 1.8% of 884 patients patch tested pre-

sented late reactions and 1.3% meeting the classic criteria of active sensitization. *P*-phenylenediamine was the most frequent sensitizer, followed by two compositae extracts and azo dyes. Beryllium was not found to be an active sensitizer in this article (6). The literature indicates that development of clinical contact dermatitis following patch test sensitization is very rare (7).

To the best of our knowledge, these are the first two cases reported of late reactions to beryllium. We suggest that these late reactions are probably due to active sensitization because retesting with beryllium caused a positive reaction within a few days, and the clinical relevance was not obvious by history. To avoid the risk of active sensitizations occurring in the future, we suggest that the patch test concentration of beryllium may need to be lowered.

References

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