

and dimetinden resulted in complete resolution within 2 days.

Patch testing with technetium 99m demonstrated a positive erythematous reaction after 2 and 3 days, with marked spread. In contrast, patch testing with methylene diphosphonate was negative. In a control person, patch testing with technetium 99m and methylene diphosphonate did not show any reaction. Histological examination of a biopsy at the site of the positive patch test reaction to technetium 99m showed lymphocytic infiltration in the upper dermis, especially around dilated small vessels.

8 h after rechallenge with technetium 99m (76.5 mBq i.v.) that was performed for a diagnostic thyroid scan, the patient developed a similar, but milder, rash. The carrier methylene diphosphonate was well-tolerated intravenously.

Discussion

Adverse allergic reactions to radiopharmaceuticals are rare. According to Cordova et al. (2) in the USA, the estimated annual incidence was between 1/100,000 and 6/100,000. 8% of the total number of adverse reactions were due to technetium 99m methylene diphosphonate,

a bone scanning agent. A delayed or late-onset erythematous eruption, appearing 4 to 24 h after injection, is characteristic of this preparation (1). The carrier methylene diphosphonate has previously been identified as the causative agent of the adverse reaction (3, 4).

With positive patch testing and rechallenge, we have shown a dose-dependent delayed-type allergy to technetium 99m to be responsible for the rash. We could find no previous case report of contact dermatitis from technetium 99m itself.

References

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Allergic contact dermatitis from dimethyl-oxo-propenyl-phenyl-imidazoline

J. S. C. ENGLISH AND N. L. WALKER¹

Department of Dermatology, Queen's Medical Centre, University Hospital, Nottingham NG7 2UH, UK

¹Occupational Health Service, The Boots Company, Nottingham NG2 3AA, UK

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10 out of 40 employees on a multi-product chemical production facility developed a diffuse acute dermatitis, predominantly on the face and neck, in October 1997. There was no hand dermatitis. Although these employees worked with a number of chemicals, the rash consistently developed in 1 particular work area. This was a compact plant involved in the manufacture of dimethyl-oxo-propenyl-phenyl-imidazoline (DOPPI), an intermediate chemical in the synthesis of a sympathomimetic. The outbreak began 2 weeks after an accidental spillage of the liquid product, even though there had been a thorough clean-up of the plant. Contact with the compound in the affected individuals must have been minimal, as they were present in the plant only on observational or supervisory duties, and were not involved in any direct handling of the chemical. Staff involved in direct operations use protective equipment and were not affected.

3 of the worst-affected operatives were patch tested to a standard series, a face series and to DOPPI at 1%, 0.1% and 0.01% pet. All 3 operatives were positive to all 3 concentrations at 2 and 4 days. 20 controls were patch tested to DOPPI 0.01% pet. with negative results.

Comment

In view of the similar clinical features of the 7 other staff affected, they are also presumed to have been sensitized to this substance. After exclusion from this production area, all cases have fully resolved. Exposure was presumed to be from very small quantities of airborne dust, persistent after decontamination. All 3 patients with positive patch tests developed symptoms between 10 days and 2 weeks after contact with the contaminated workplace. Their contact was fairly minimal, yet they still became sensitized.

Information received after the outbreak indicated that the murine local lymph node assay for sensitizing potential was positive, with a 10× increase in activity at 5% and no decrease in activity at 0.5%. If there is a greater than 3× activity, this is deemed to indicate a sensitizer. Unfortunately, we have now confirmed that the chemical DOPPI is a strong sensitizer in humans.