

## Exacerbation of nickel dermatitis by margarine

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D. H., a woman aged 42, developed dermatitis in 1970. The first symptoms appeared on the thighs where her metal suspenders were in contact with the skin. She ceased to wear them and the dermatitis cleared.

Since October 1975 she has had almost constant dermatitis, mainly on the hands and feet and on the face and neck. She was patch tested in September 1976 and found to be positive to chromium, nickel and paraphenylenediamine (PPD). The source of her allergy to chromium was considered to be the leather in her shoes and her watch strap. She is one of the few patients we have seen positive to PPD in whom we were able to demonstrate that a number of articles dyed with vivid colours (red, blue and yellow) were aggravating factors. Among these were cloth slippers, a dressing gown and the fabric covering an armchair. She was not patch tested to these but after every contact with them she developed an exacerbation.

The only contact with nickel which could be established occurred during the patient's work. She was employed in the manufacture of tents and for several hours each week handled zip fasteners.

Polish margarine contains nickel (upper level 0.2 mg per kg). We wanted to find out whether the ingestion of margarine would cause an exacerbation of dermatitis. This was possible because the patient was able to consume 250 g of margarine with rice in about 2 hours. The first exposure was done on 20 January 1977. Two hours later itching began and new lesions appeared on the forearms. After application of 1% hydrocortisone ointment, the eruption cleared within 5 days. To be sure that this exacerbation was not coincidental the patient was once more asked to eat margarine on February 5th. This time the result was indecisive. The patient complained of itching after 2 h but no skin eruption appeared. Therefore, on March 8th she was re-exposed to the same agent 10 days after the disappearance of all lesions. She consumed the whole portion of margarine (250 g) within 20 min. Half an hour later lesions of dermatitis appeared on the forearms, shoulders and thighs, where a flare-up occurred at the sites of her previous dermatitis from nickel-plated suspenders. No dyshydrotic eruption was seen on the hands.

## 4,4' Diisocyanato dicyclohexyl methane (Hylene W): A strong contact sensitizer

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On the first of March 1977, a 25-year-old chemical engineer began investigative work with various polyesters and isocyanates. This was just after he had finished his studies. He had no previous skin or respiratory complaints. There is no atopy in the family.

Seventeen days later an itchy polymorphic dermatitis started on the face, soon involving

the volar aspects of the wrists beyond the rubber gloves he wore during this work. After he stopped this work the dermatitis healed uneventfully in 3 weeks with topical corticosteroid treatment. He was then patch tested with the substances of the international standard test tray (1974) and with 32 substances he had used in his research. The only substance to

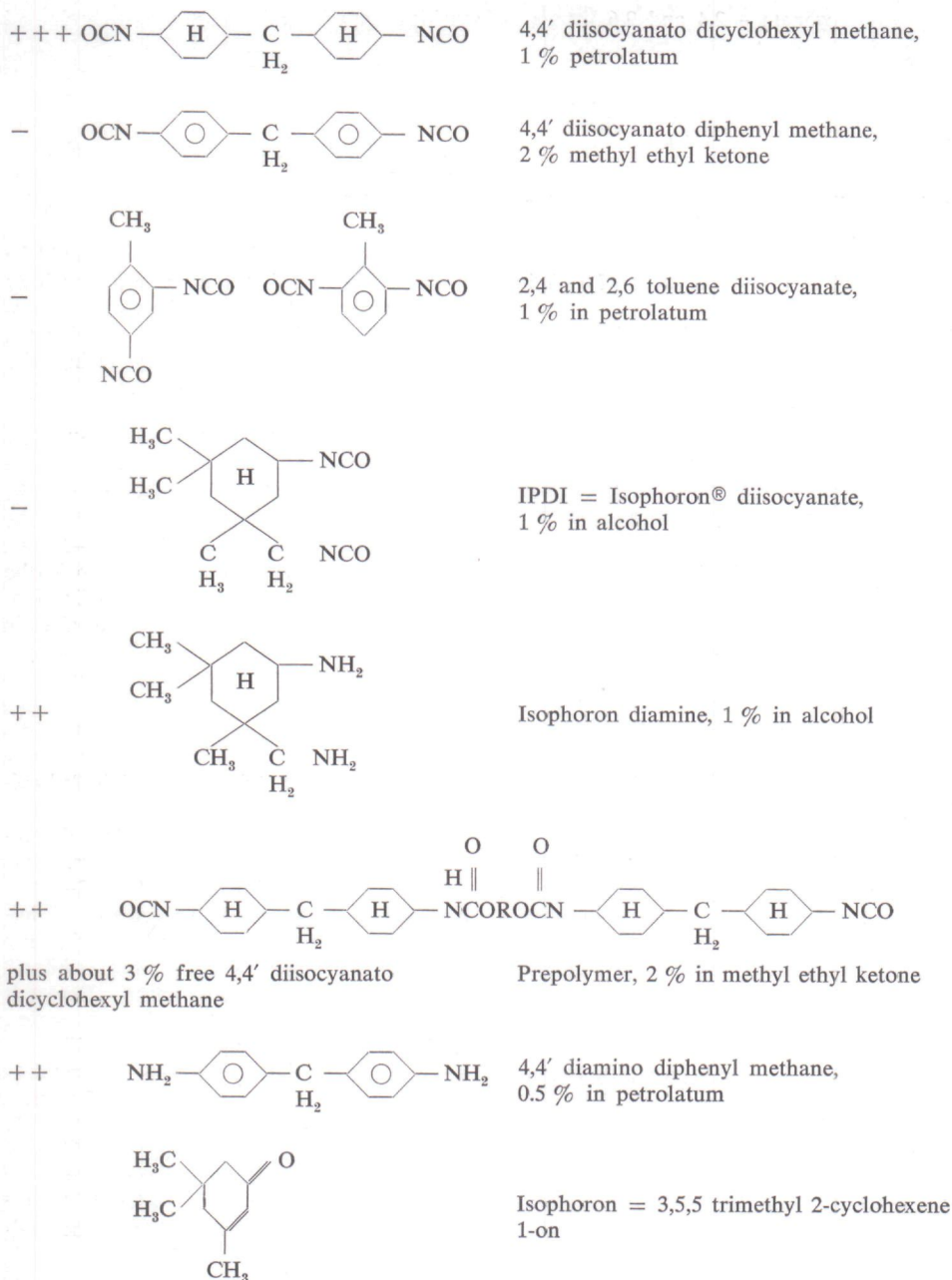


Fig. 1.

which he clearly reacted was 4,4' diisocyanato-dicyclohexyl methane (= methylene bis (4-cyclohexylisocyanate)). He did not react to:

4,4' diisocyanatodiphenyl methane (= methylene bis (4 phenyl isocyanate) = MDI = methane diphenyl diisocyanate)

toluene diisocyanate - 2,4 and 2,6  
(= TDI)

Isophoron diisocyanate (= IPDI = 3 isocyanatomethyl 3,5,5 trimethyl cyclohexyl isocyanate)

Isophoron diamine (= IPD = 3 aminomethyl 3,5,5 trimethyl cyclohexyl amine).

All were tested at a concentration of 1 % in alcohol.

The patient had also worked with a prepolymer made from a polyester which reacted its-OH groups with the isocyanate groups of 4,4' diisocyanato-dicyclohexyl methane. This prepolymer contains 3 % of unreacted 4,4' diisocyanato-dicyclohexyl methane in excess. This prepolymer was tested at 2 % in methyl-ethylketone with late positive results.

Emmet (1976) reported on three polyurethane plastic moulders, two of which showed positive patch tests to three different prepolymers made from 4,4' diisocyanato-dicyclohexyl methane. The second compound with which the 4,4' diisocyanato-dicyclohexyl methane had reacted to produce a prepolymer was not mentioned. The three prepolymers were named Adiprene LW 520, LW 550 and LW 570. Both patients also reacted to 4,4' diaminodiphenylmethane, a catalyst with which these patients also had contact.

My patient has had no contact with 4,4' diaminodiphenylmethane. He showed nevertheless a positive reaction to this substance. This may be due to an immunochemical relation to 4,4' diisocyanato-dicyclohexyl methane. Rothe (1976) likewise supposes an immunochemical relation between 4,4' diaminodiphenylmethane and MDI.

"Isophoron" diamine was reported by Lachapelle (1977) as a sensitizer in workers who produced tennis rackets manufactured from epoxy resin plus "Isophoron" diamine as a hardener. IPDI ("Isophoron" diisocyanate) is reported by Rothe (1976) to have sensitized four workers in a chemical laboratory after only very short exposure. He also reported active patch test

sensitization with this substance in undiluted form.

Hansen & Rothe (1976) summarized occupational medical view points in the processing of polyurethanes in a monograph. In this booklet and in chapter 27 on polyurethanes of Brydson's book (1975) on plastic materials, information is given about new developments in this field.

Such highly sensitizing substances should be adequately labeled but not in terms such as "skin hazard", or "may give dermatitis in sensitive humans". They should be designated "strong contact sensitizer, easily giving rise to an allergic contact dermatitis".

"Isophoron" diamine and "Isophoron" diisocyanate are trade names for structures as shown in Fig. 1. These are regrettably misleading names as a double bonded = O in the 1-position and a double bond in the 2-3 position are missing, whereas a CH<sub>3</sub> group in the 3 position is added. However, the suffix "Isophoron" in these compositions has already become a trade name.

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