

OCCUPATIONAL DERMATITIS CAUSED BY CEMENT

E.F. ANGRISANO, R. BARLETTA, P. BIANCO and A. IERVOGLINI
*Institute of Occupational Medicine, Second Faculty of Medicine and Surgery,
University of Naples, Naples, Italy*

ABSTRACT

The results of the study of contact dermatitis in workers from south Italy who have been exposed to cement for various lengths of time are presented. Patch tests were carried out according to the propositions agreed by the International Research Group on Contact Dermatitis.

Out of 90 subjects studied 70 suffered from cement dermatitis. All of these showed a positive reaction to BK (10% were simultaneously sensitive to Cb and 85.7% only to BK). No positive reaction was found to Cb only. In most cases the period of time which elapsed between the first exposure to cement and the first clinical signs was rather short. A positive reaction to BK was also encountered without clinical signs.

The number of workers with cement eczema, most of whom come from the south of Italy¹, has prompted us to study the epidemiology and the etiopathogenesis of the disease and to determine in a group of patients, the most irritant substances and the latent time from the initial exposure to cement to the eruption of skin lesions.

In Italy occupational dermatitis accounts for 14.8% of all occupational diseases. According to Meneghini and Angelini³ out of 2074 cases of eczematous dermatitis 33.2% were found among bricklayers and cement workers.

Our study has concentrated on a clinical-statistical analysis of a group of cement workers from the building yards in Campania and Calabria with a suspected dermatitis.

SUBJECTS AND METHODS

During 1977 dermatosis was diagnosed in 90 workers. The diagnosis was placed either after a medical check-up in the first aid station (60 workers) or during the hospital treatment (30 workers).

The patch tests with BK and Cb were carried out in accordance with the recommendations of the International Research Group on Contact Dermatitis.

RESULTS AND DISCUSSION

Out of 90 patients with dermal changes 70 were found to be suffering from cement dermatitis. One patient, although showing no typical clinical symptoms, produced a positive reaction to the patch test with BK. All patients had positive reaction to BK patch test. Seven patients (10%) had at the same time positive reaction to Cb, while 60 (86%) positively reacted to BK only. No positive reaction was found for Cb only.

As many as 54 patients (77%) developed cement eczema during their first year of exposure to cement, 14 (20%) during the second year and only one during the third year.

From our results it is evident that all the patients showed positive reactions to BK and that most of them developed an eczema during the first two years of exposure (97% of the patients). This supports the hypothesis of the genetic predisposition of the patients to develop dermatitis from cement by the interaction of the sensitising agent with the "immune response gene".

The pathogenic process involves a phenomenon of cellular or delayed hypersensitivity (Coombs 4th type) to substances which come into contact with the skin and which have certain properties such as solubility in the hydrolipidic layer that covers the surface of the cutis and a phenomenon of the function of haptens. This kind of allergy is due to a cellular reaction to T-lymphocytes and more specifically to a kind of T-lymphocyte distinguished by its capacity to kill the target, consequently called "killer".

In the case of cement eczema, the target is represented by the cutaneous cells of the deep layers of the epidermis which have absorbed the haptene which, in this case, is chromium.

In one patient we also noted a positive reaction to BK without noticeable clinical manifestations, only with vague itchy sensations in the upper limbs. The patient had been exposed to hydrated cement for five years. Such cases can be found in papers relating to the latent positive reaction to BK⁴ and are confirmed by own unpublished results which show sensitivity to BK in 6 out of 50 healthy building workers periodically exposed to contact with chromium. Perišić and co-workers⁵ report 13 cases of positive reaction to BK in 158 healthy building workers (8%). Barbier states that 5.5% of 322 brick layers and cement workers showed a latent positive allergy².

World-wide research has shown that patients suffer greater discomfort when dealing with fine-grain cement and that the most dangerous period is when cement is setting, i.e. when oxidation reaches the maximum.

It also seems that workers in the south are more liable to affection than others because of environmental and climatic factors; in fact prolonged exposure to wet cement reduces the skin's powers of resistance. High temperatures and heavy perspiration also favour the solution and absorption of cement dust and consequently sensitisation of the skin⁶.

In conclusion it should be stated that today cement eczema represents a high proportion of occupational eczemas (figures of around 33% have been cited in

literature). It affects between one and eight percent of cement workers and a large number of the affected workers are obliged to change job or at least to continue working in great discomfort and at a reduced salary.

The time has therefore come to pay more attention to this problem and to initiate an extensive research programme both regarding the prevention and the therapy of this disease.

REFERENCES

1. *Ambrosio, L., Musumeci, V.* Considérations statistiques sur les dermatoses eczémateuses du ciment. XV Congrès International de Médecine du Travail, Vienne 19–24 September, 1966.
2. *Barbier, J. M.* Rôle du chrome dans les dermatites du ciment de la région Lorraine. Thésis Med., Nancy, éd. Oudart et Clement, Nancy 1969.
3. *Meneghini, C. L., Angelini, G.* Rilievi sulla evoluzione, prevenzione e riabilitazione delle dermatiti allergiche professionali. Fondazione Carlo Erba, Milano 1976, p. 24.
4. *Meneghini, C. L., Rantuccio, F., Lomuto, M.* Modelli sperimentali della ipersensibilità di tipo ritardato da contatto: implicazioni cliniche nelle dermatiti eczematose. *Folia Allergol.*, **18** (1971) 317–335.
5. *Perišić, S., Sofronić, A., Jovović, D.* Les études des facteurs étiologiques chez les dermites de contact provoquées par ciment. XIII Conf. Int. Dermatologia, Springer, Berlin 1968, Vol. 1 p. 291.
6. *Petruszelis, V., Rantuccio, F., Meneghini, C. L., Bruno, P.* In tema di morbidità cutanea da cemento in cantieri edili e nelle comenterie. *G. Ital. Dermatol. Minerva Dermatol.*, **485** (1969) 110–144.