

Contact dermatitis

Contact dermatitis (CD) consists in inflammatory skin reactions caused by the contact with environmental agents. These may entail direct toxic damage to the skin (irritation, irritant contact dermatitis) or act by inducing sensitization (allergy triggering process) with subsequent development of contact dermatitis.

Irritant contact dermatitis (ICD) is a skin disease caused by single or repeated contact with exogenous, chemical, physical or biological agents. It develops through a direct toxic mechanism with no immunological mediation, and it occurs, therefore, only at the site of contact. As far as fabrics are concerned, they rarely represent a cause of irritation. Only in some hypersensitive or already affected by inflammatory dermatitis people they can cause reddening and dryness of the skin. Symptoms are usually light and reversible after end of exposure.

Allergic contact dermatitis is, instead, a skin inflammatory process developing as a consequence of delayed and cell-mediated sensitization by skin contact with exogenous agents. At first located where one get in contact with the sensitizing substance, it then extends to other sites, whether exposed or not, with possible tendency to spread. It is accompanied by variable itching and is often relapsing, due to repeated skin exposure but also, sometimes, even in the absence thereof.

Allergic contact dermatitis diagnosis is made through skin tests, that is, testing methods based on controlled exposure of tiny areas of the skin to potentially sensitizing substances capable of inducing an experimental eczema. Among the common causes of allergic contact dermatitis are fabrics and garments, especially because of the finishing products and sensitizing dyes employed in making them.

Most cases of known dermatitis due to contact with garments are induced by dyes used in the coloration of textile fibers. Textile-dye dermatitis mainly concerns armpit folds, neck, front and rear portion of thigh, but it can also affects the whole skin causing red, vesiculated, raised and very itchy spots.

Textile dyes showing most frequent sensitizing effects belong to the group of disperse dyes (e.g., disperse orange 3, disperse blue 124, disperse blue 106, disperse yellow 3, disperse red 1). They are formed by chromogenic structures free from solubilizing polar groups, which disperse but not dissolve; they build low-stable bonds with synthetic fibers, they are liposoluble and can be easily absorbed by the skin. The dye transfers from the fabric to the skin, usually by direct contact and especially at the friction sites, but it can sometimes pass through an underlying garment or underwear. Sweat, friction and overweight represent factors enhancing sensitization. Textile-dye dermatitis is most often reported in women over 40 being overweight and affected by axillary hyperhidrosis.

Sensitization cases being signalled are on the rise, even though the real size of the problem is still underestimated, observation thereof being limited to the most severe and widespread forms.

Textile-dye dermatitis diagnosis poses some difficulties, since anamnestic investigation is usually of little help. In fact, most patients are not able of linking their skin affections to the use of any special garment. Therefore, textile dyes are not always included in the substances used for testing and, as a consequence, no diagnosis can be made.

Contact allergy diagnosis is made even more complicated by the lack of exhaustive bibliographical and merceological indications about allergens, beside the fact that not all of these dyes are listed in the Colour Index with their chemical formula, since they can have more than one commercial name. Predictive tests for textile dyes aiming at identifying non-sensitizing substances are not usually performed and, with the exception of Italy, Germany, Portugal and North America, disperse dyes have not been included in the standard series for patch testing yet. Available literature data concerning the prevalence of sensitization through contact with disperse dyes mostly refer to studies carried out on the Italian population. Only recently interest in such contact allergens has been awakened and, in countries such as Israel and Canada, it has been demonstrated that contact dermatitis due to disperse dyes is more frequent than previously gauged. Also the German and Austrian population revealed a high frequency of sensitization to disperse blue dyes 106 and 124. Disperse blue dyes, in particular, were elected, in year 2000, "allergens of the year".

Beside disperse dyes, a number of other textile dyes presently being studied are likely to cause contact dermatitis but escape diagnosis, as they are not yet included in the patch test series.

What is more, assessing the relevance of positivities detected during skin tests by extracting the dye from the fabric and identifying it (Thin Layer Chromatography, Magnetic Resonance, and Infrared Spectroscopy) is a demanding task.

It should not be forgotten, then, that disperse dyes used for testing are not pure, thus making it difficult to establish conclusive correlations with test results.

At the Dermatology Clinic in Modena, disperse dyes have been included in the standard series for patch tests since 1987, and that enabled us to have a wide range of relevant cases available, based on the study of about 15,500 patients.

Considering this illness etiology, the first "treatment" for ACD is represented by avoidance of contact with the sensitizing agent and no general or local treatment will be successful if exposure persists. Prevention is, therefore, of major importance: *primary prevention* aims at avoiding any possible cause of contact dermatitis

occurrence in the healthy population, both in the work and extra-work environment, whereas *secondary prevention* is aimed at preventing people affected by contact dermatitis from experiencing illness relapse or chronicity.

Co-operation between dermatologists/allergologists and the textile industry represents, therefore, a key element in developing safe garments, that is, capable of preventing, both in healthy and allergic people, the occurrence of allergic reactions. In particular, the production of hypoallergenic children's wear may be seen as a basic preventive measure for all those who have a family or personal history of allergies, whereas for affected older children or adults the availability of fabrics free from allergizing substances may represent the beginning of recovery and guarantee the non-occurrence of relapse.