

Editorial

Pityrosporum orbiculare and atopic eczema

In this issue of *Allergy*, G. Doekes and coauthors of The Netherlands present two papers on allergens of the yeasts *Pityrosporum ovale* (*orbiculare*) and *Candida albicans*, discussing their possible roles in various atopic diseases. One paper deals with the cross-reactivity of IgE-binding components between the two yeasts (7); the other with physicochemical characterization of IgE-binding components (8). The latter paper also suggests that IgE antibodies may bind to carbohydrate antigens in the respective yeasts.

The importance of inhalant allergens as triggers of IgE-mediated allergic reactions and as agents in the pathogenesis of bronchial asthma and rhinoconjunctivitis has long been established and is not disputed. The situation is not as clear in atopic eczema, but food and inhalant allergens, those of house-dust mites in particular, have been implicated as conductors of eczematous lesions. The recent discovery that patients with atopic eczema are frequently skin test positive and may have serum IgE antibodies against a commensal, lipophilic yeast, *P. orbiculare*, adds a new dimension to the possibility that IgE-mediated allergy is important in this disease (14, 15, 23). Atopic sensitization to *P. orbiculare* has been shown almost exclusively in eczematous patients, especially with eczema in the head-neck-face region; that is, the predilection areas of growth of the yeast. *P. orbiculare* is present in the skin of most adults, but is less prevalent before puberty (17). It has been reported that eczema in patients with atopic allergy to the yeast improves with oral treatment with the fungicide ketoconazole (6). Allergen characterization of *P. orbiculare* with SDS-PAGE has revealed a multitude of IgE-binding compounds, many of which are of a high molecular weight for allergens (10). The yeast is already known to cause pityriasis (linea) versicolor and Pityrosporum folliculitis, and it is also implicated in the pathogenesis of seborrheic dermatitis (9).

The possible role of *C. albicans* as an allergen in atopic asthma and rhinitis has long been investigated. This yeast does not normally colonize the skin, but *Candida* species are common commensals in the gastrointestinal tract (16). Studies on characterization of *C. albicans* allergens and clinical aspects of allergy to this yeast have more recently been published (11, 19, 20). The importance of atopic allergy to *C. albicans* as in atopic asthma, as compared with that of other allergens, is, however, unclear, since patients with IgE antibodies against fungi frequently exhibit IgE responses to several other allergens (13).

Doekes & Van Ieperen-van Dijk (7) found significant cross-reactivity between extracts of *P. orbiculare* and *C. albicans*, a finding which agrees with one previous study (18). Much of the IgE-binding capacity of the extracts of both yeasts resided among lectin-binding components (8), a result which has previously been found for *C. albicans* allergens (19). These components are probably derived from mannan-containing cell-wall structures. The authors speculate that IgE antibodies against these yeasts are directed mainly to carbohydrate epitopes and that IgE antibodies against *C. albicans* largely reflect IgE antibodies against *P. orbiculare*. However, this hypothesis, which is of considerable interest, however, requires to be confirmed by other well-characterized extracts, particularly of *P. orbiculare*, which has not been as well studied in this respect as *C. albicans*. Furthermore, a definite proof of an IgE antibody response to polysaccharide antigens should include the testing of synthetic compounds. In heterogeneous material such as allergen extracts, there is a possibility that the biologic effects studied result from minute quantities of impurities. In this case, there is the possibility that IgE binds to small peptides bound to carbohydrate molecules. These objections may also apply to other studies which indicate that carbohydrate epitopes bind IgE antibodies.

The mechanisms by which IgE antibodies evoke an inflammatory response in the skin

need not be exactly the same as those in the airways. Since Bruijnzeel-Koomen et al. in 1986 published data on the presence of IgE-bearing Langerhans' cells in the skin of patients with atopic dermatitis (4), much interest has been focused on the role of the epidermal Langerhans' cell in the pathophysiology of atopic eczema. IgE + Langerhans' cells are also found in disease states other than atopic dermatitis, and the proportion of IgE + cells is correlated to the level of serum IgE (2, 21). Originally it was asserted that the low-affinity receptor for IgE (Fc_εRI, CD23) was the main binding receptor for IgE on Langerhans' cells and that the CD23 receptor could be induced on normal Langerhans' cells after culture in the presence of the cytokines interleukin-4 and/or interferon- γ (1). However, recent studies have shown that normal human Langerhans' cells can bind the Fc fragment of IgE via the high-affinity receptor for IgE, Fc_εRI, previously described only on mast cells and basophils (3, 22). The knowledge that Langerhans' cells constitutively have the capacity to bind IgE opens up new perspectives on the role of Langerhans' cells in capturing and presenting allergens. It has been shown that IgE on Langerhans' cells is a requirement for their capacity to present house-dust mite allergens to T cells from sensitized persons and that this *in vitro* function correlates with the *in vivo* presence of a positive patch-test reaction to house-dust mite allergens (12). Whether, as in mast cells and basophils, cross-linking of IgE via Fc_εRI on Langerhans' cells may cause an inflammatory response by stimulating the biosynthesis and secretion of cytokines and of arachidonic acid metabolites remains to be determined. Much of the research on the functions of Langerhans' cells has been hampered by the fact that they are difficult to isolate in sufficient number. The possibility of expanding CD34 + hematopoietic progenitors in the presence of granulocyte macrophage-colony stimulating factor (GM-CSF) and tumor-necrosis factor- α (TNF- α) to obtain CD1a + cells with many of the features of Langerhans' cells may prove to be rewarding (5).

The prospect that IgE-mediated reactivity to a commensal yeast may be a pathogenic factor in atopic eczema calls forth the possibility of specific allergy diagnosis and antifungal therapy in the clinical approach. Careful chemical characterization of IgE-binding components in *P. orbiculare* is needed to obtain a relevant allergen preparation for use in clinical practice and further research.

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