

Occupational egg allergy in confectionary workers

WORKERS in the confectionary and baking industry are exposed to egg, either in natural or powdered form, or as aerosol liquid; this poses a risk of sensitization and the appearance of respiratory and/or cutaneous symptoms. Inhalatory exposure to egg may trigger extrinsic allergic alveolitis (1), rhinoconjunctivitis, and bronchial asthma (2, 3).

■ Two patients were studied.

■ Patient 1 was a 60-year-old man suffering from rhinitis and urticaria on the hands, symptoms related to his job. The onset of his symptoms coincided with his handling and beating egg white. Vomiting, accompanied by pruritus of the mouth and lips, occurred 15-30 min after ingestion of egg.

■ Patient 2 was a 31-year-old man suffering from bronchial asthma and rhinitis of 5-year evolution. The onset of symptoms was related to the handling of wheat flour and/or spraying of a 50% egg-white-and-water dilution. The patient also complained of concomitant pruritus on his hands upon working with eggs. No symptoms appeared on ingestion.

Both patients were prick tested for the following inhalant allergens: mites, pollens, animal dander, all cereal grains and flours, and soya flour; yeasts;

and fungus-derived α -amylase. The skin test (prick test) commercial extracts (C.B.F. Leti, Madrid, Spain) were as follows:

whole egg (0.55 mg/ml), egg white (0.1 mg/ml), egg yolk (1 mg/ml), ovalbumin (1 mg/ml), and ovomucoid (1 mg/ml).

We then performed the following laboratory tests: IgG, IgA, IgM, and IgE. Specific IgE was tested by RAST (Pharmacia, Uppsala, Sweden).

The nasal provocation test was performed with an egg-white and physiologic saline solution at a concentration of 10%, starting at 1:1000 (w/v). Negative controls were carried out on three exposed and asymptomatic patients.

Tests were considered positive when a patient complained of rhinitis and/or changes in the rhinomanometry.

■ We considered results positive when the wheal diameter exceeded the results of the histamine control with planimetry. The results of the serum immunoglobulins were normal in both patients.

■ Patient 1. Skin tests were positive for whole egg, egg white, yolk, ovalbumin, wheat flour, pollen, rye, and wild grasses extracts. Laboratory tests were positive for specific IgE RAST to egg white (0.70 PRU/ml, class 2), egg yolk (0.60 PRU/ml, class 1), and wheat (0.40 PRU/ml, class 1). Total IgE was 11 IU/ml. The nasal provocation test was positive for 1/100 egg white and for 1/10 wheat flour (w/v).

■ Patient 2. Skin tests were positive for ovalbumin, whole egg, egg white, yolk, ovomucoid, wheat and rye flour, wheat, and wild grasses. Laboratory tests were positive for specific IgE RAST to egg white (20.0 PRU/ml, class 4), egg yolk (2.0 PRU/ml, class 2), and wheat (7.0 PRU/ml, class 3). Total IgE was 426 IU/ml. The nasal provocation test was positive for 1:10 egg white (w/v) and for 1/10 wheat flour (w/v).

■ One of the patients described complained of the onset of mouth and gastrointestinal symptoms after eating egg. To explain tolerance to egg ingestion in patients sensitive to inhalation of egg, it has been suggested that the antigenic structure of egg may be modified during digestion (2).

Several authors have found IgE sensitization to different fractions of egg in exposed workers (2, 3).

Edwards et al. (1) described eight cases of positive bronchial provocation in 13 bakers exposed to inhalation of egg, detecting positive skin tests, specific IgE, and precipitins to egg proteins, the most frequently involved being ovalbumin.

Smith et al. (3) described five cases of occupational asthma in workers exposed to egg, with just over 2 years' exposure (latency period) before the onset of symptoms, but found no association between history of atopy and sensitization to egg.

In an epidemiologic study carried out on 188 workers in a company producing powdered and liquid egg who were exposed to these allergens, the same authors detected 14 patients with bronchial

IgE-mediated inhalation allergy to egg white.

asthma (7%), 5% of whom handled egg powder and 12% raw egg. This suggests that raw egg has greater sensitization potential. The authors obtained positive skin tests to egg white and ovalbumin in 12 patients, to whole egg in 11, to egg yolk and ovalbumin in nine, and to lysozyme and ovomucoid in seven, a finding which may indicate the heterogeneity of the allergenic fractions involved.

It is thought that the major allergens found in egg are as follows: OA (45.0 kDa), OM (28.0 kDa), and OTr (77.7 kDa). Amino acid sequences have been described in these proteins, namely, Gal d 1, II, and III, respectively (4). The importance of Lsz (14.0 kDa) as a major allergen has been debated (5).

Key words: egg white; inhalation sensitization; nasal provocation test; occupational allergy; wheat flour.

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Peripheral blood CD8+ T-cell subsets in common variable immunodeficiency

COMMON variable immunodeficiency (CVI) is defined by low serum IgG and IgA levels, and is usually associated with low IgM levels. The apparent proximal cause is arrest of the B-cell differentiation pathway. CVI patients currently exhibit a normal number of T cells (1); nevertheless, the possibility of a subtle dysfunction of T cells or of other types of auxiliary cells required in the

initial maturational steps of the B-cell population cannot be excluded.

In this paper, we describe our findings on the CD8+ T-cell subsets (CD8+^{dim} and CD8+^{bright}) in five patients diagnosed with CVI.

■ Our study was performed on five patients diagnosed with CVI. At the moment of the blood extraction, all of them had neither infections nor other known diseases that could affect their immunologic status, and they were not undergoing pharmacologic treatment, exclusive of intravenous (i.v.) Ig replacement. A group of seven healthy volunteers was used as control group.

Flow cytometry was carried out in an Epics Elite® flow cytometer (Coulter Cytometry). Leukocytes were prepared from 10 ml EDTA blood collected from

patients and controls. Erythrocyte-specific lysing and leukocyte cell membrane stabilization

(fixation) was performed by the Q-Prep® quick sample preparation system (Coulter Cytometry). Then, 100 µl prepared sample was treated with 10 µl specific monoclonal antibody for 15 min at room temperature in the dark. Phycoerythrin-conjugated and fluorescein isothiocyanate (FITC)-conjugated specific monoclonal antibodies were used (Coulter Corporation): anti-CD4 labeled with phycoerythrin, anti-CD14 labeled with FITC, anti-CD3 labeled with phycoerythrin, anti-CD19 labeled with FITC, and anti-CD8 labeled with FITC. By light-scattering properties, lymphocytes were counted and separated from granulocytes and monocytes. The percentage of positive cells was calculated by subtracting background fluorescence produced by the negative control.

The nonparametric Mann-Whitney U test was used to compare the values observed in our CVI patients and in the control group. A difference of $P < 0.05$ was considered to be statistically significant.

■ Data of patients and controls are shown in Table 1. There was no significant difference in CD4+ T-cell percentage between patients and controls. In the CD8+ T-cell subsets, there was no significant difference in percentages of the CD8+^{dim} subset, but percentages of CD8+^{bright} T cells in patients diagnosed with CVI were statistically higher than in healthy controls ($P < 0.01$). These results were reflected in the ratios between such T-cell subsets: the CD4+/CD8+ and CD4+/CD8+^{bright} ratios were significantly lower in patients than in healthy controls ($P < 0.01$, both).

Patients with CVI have increased percentage of CD8+^{bright}.

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