

Anaphylactic reactions caused by oil body fraction lipoproteins

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Food allergy is highly prevalent in our environment. Olive crops are common in our region, and its fruit is frequently consumed as food and used as raw material to obtain olive oil. Despite widespread consumption, allergies to olive fruit and derivative products have seldom been reported. Few cases of contact dermatitis and contact urticaria caused by olive oil or olives have been documented (1–3), and only three cases of allergy caused by olive ingestion have been described (4, 5). Thaumatin-like protein (6) and other proteins with a 10–15 kDa molecular mass are those described as allergenic in the patients with olive allergy (4, 6).

A 20-year-old man was admitted to our allergy unit for investigation into recurrent food-induced anaphylaxis. He reported contact urticaria to peach peel and oral allergy syndrome to sunflower seed. Afterward, he suffered several episodes of anaphylaxis by nut ingestion and more recently two

anaphylactic reactions (generalized urticaria, facial angioedema, and hypotension), clearly associated with ingestion of olives. He also referred seasonal rhinoconjunctivitis.

Skin prick test (SPT) with commercial extracts (Diater, Madrid, Spain) was performed with a battery of the common inhalant allergens and also with a panel of plant food allergens (including olive). Skin prick test was positive for *Platanus* and *Parietaria* pollen and only positive for hazelnut, walnut, peach peel, sunflower seed, and mustard food extracts when testing the panel of plant food allergens.

Further, SPTs were performed using home-made extract of liposoluble proteins from olives, hazelnut, and sesame and prick to prick with olive. A wheal diameter of 13, 9, and 10 mm was

obtained from olive and liposoluble proteins from olive fruit and hazelnut, respectively.

Total IgE was 160 kU/l and specific IgE to peach was 4.18 kU/l (Phadia, Uppsala, Sweden). Specific IgE to molecular allergens was measured using ImmunoCAP ISAC (Phadia) with values above 0.30 ISU units for nPla a 2, nCry j 1, nPru p 3, rCor a 8, nArt v 3, and rPar j 2.

The presence of specific IgE to lipoproteins from olives, hazelnut, and sesame seed (Fig. 1A) was investigated using immunoblotting. The samples assayed revealed the binding to several lipoproteins among which oleosins are involved. Previously, hydrosoluble proteins were assayed with the patient's serum, but none of the proteins were recognized.

A patient with anaphylactic reactions associated with ingestion of olives was diagnosed to olives' lipoproteins.

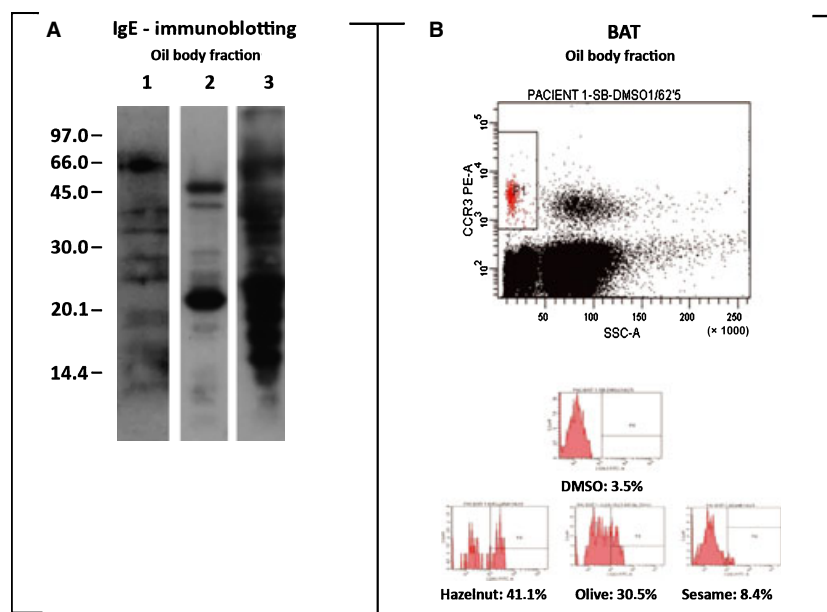


Figure 1 (A) IgE immunoblotting technique: Lanes 1–3: Oil body fraction proteins from olive fruit (1), hazelnut (2) and sesame seed (3). (B) Basophil activation test (BAT) to oil body fraction proteins from hazelnut, olive and sesame.

The basophil activation test (BAT) was performed following Flow2-CASTM (Bühlmann, Schönenbuch, Switzerland) manufacturer's procedure. The stimuli used were lipoproteins from olive, sesame, and hazelnut in DMSO. The test was positive for olive fruit (30.5%), hazelnut (41.1%), and sesame extract (8.4%). The BAT was performed in parallel with two nonallergic individuals obtaining a negative result with the stimuli tested (Fig. 1B).

In summary, the clinical information and the allergologic study have shown that the patient presents a food allergy because of his sensitization to peach- and hazelnut-lipid transfer proteins (Pru p 3 and Cor a 8, respectively), which could explain some of the reactions suffered. However, the more relevant information of this case is that the patient also presents a sensitization toward lipoproteins, which could explain the anaphylactic reaction caused by olive ingestion and also could contribute to nut allergy.

Lipoproteins are recognized by patient's IgE antibodies. So the

lipoproteins of olives (and of the other nuts and fruits tested) have allergenic properties, which are relevant as hydrosoluble proteins. Therefore, we state that the liposoluble protein fraction could be used for diagnostic purposes, especially in those patients with negative results to standard extracts in prick tests and specific IgE measurements. In this way, should we make a careful study about the role of lipid derivatives as allergens? Most of allergens are obtained through hydrosoluble methods that remove the lipid derivatives from the allergenic extract.

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