Spain) revealed positive (wheal diameter 3 mm above the negative control) to kiwi, pear, banana, watermelon, cherry, passion fruit, walnut, pistachio and latex (wheal diameters of 4, 5, 5, 6, 5, 5, 4, 3 and 12 mm, respectively; positive control 8 mm and negative control 0 mm).

The skin prick–prick tests to several raw foods and latex revealed positive to latex, chestnut, walnut, pistachio nut, blackberry, tomato, zucchini and turnip (wheal diameter of 12, 13, 5, 4, 4, 5, 7 and 5 mm; positive control 6 mm and negative control 0 mm).

The total serum IgE level was 34 IU/l and the serum-specific IgE to latex 3.2 KU/l (ImmunoCAP^{TM}, Phadia, Uppsala, Sweden). As the sensitization to turnip and zucchini were not previously described in the latex–vegetable–fruit syndrome, we decided to proceed with further investigation. The specific serum IgE to turnip and zucchini revealed 0.64 and <0.35KU/l, respectively. Previous incubation of serum with turnip and latex nondiluted extracts resulted in an inhibition of 99.3% and 93%, respectively, of turnip ImmunoCAPs reaction. Latex ImmunoCAP reaction was inhibited with both zucchini and turnip extract, respectively (Fig. 1A). Specific IgE levels to rHev b1 (Rk215), rHev b5 (Rk218) and rHev b6.01 (Rk219) were 0, 0.31 and 2.9 KU/l, respectively. Inhibition study of rHev b6.01 with nondiluted extracts of turnip and zucchini revealed an inhibition of 63% and 52.3%, respectively (Fig. 1B).

Despite cross-reactivity between zucchini and latex had been previously described (3) with this study, we could prove for the first time cross-reactivity between turnip and latex and identify Hev b6.01, the chitin-binding protein, as the protein responsible in this latex–fruit syndrome. Turnip and zucchini should be added to the long list of plant-derived foods cross-reactive to latex and sensitization to these vegetables must be assessed in patients with latex anaphylaxis.

*Serviço de Imunoalergologia
Hospitais da Universidade de Coimbra
Apartado 9057
3001-301 Coimbra
Portugal
Tel: +351 917205277
Fax: +351 239836262
E-mail: celsopereira@netcabo.pt

Accepted for publication 8 December 2006
Allergy 2007: 62:452–453
© 2007 The Authors
Journal compilation © 2007 Blackwell Munksgaard
DOI: 10.1111/j.1398-9995.2006.01313.x

References

1. M'Raihi L, Charpin D, Pons A, Bongrand P, Vervloet D. Cross-reactivity between latex and banana. J Allergy Clin Immunology 1991;**87**:129–130.
2. Blanco C, Carrillo T, Castillo R, Quiralte J, Cuevas M. Latex allergy: clinical features and cross-reactivity with fruits. Ann Allergy 1994;**73**:309–314.
3. Reindl J, Anliker MD, Karamloo F, Vieths S, Wüthrich B. Allergy caused by ingestion of zucchini *(Cucurbita pepo)*: characterization of allergens and cross-reactivity to pollen and other foods. J Allergy Clin Immunology 2000;**106**: 379–385.

Effectiveness of omalizumab in monozygotic twin sisters with severe allergic asthma

J. Just*, F. Sahraoui, V. Le Gros, A. Grimfeld

Between 5% and 10% of children worldwide suffer from asthma (1). The familial nature of asthma is well known; the risk for a first cousin of an asthmatic patient is multiplied by 2.5–3 compared with the general population (2). Studies of twins have confirmed this genetic component finding higher concordance of asthma among monozygotic (58.97%) than dizygotic twins (23.64%) (3). We report an exceptional clinical situation of monozygotic twin sisters with severe allergic asthma where one was treated with a monoclonal anti-IgE antibody (omalizumab), and the other with a placebo in a randomized, double-blind, placebo-controlled study (4).

Omalizumab in twin sisters.

Premature monozygotic twin sisters developed bronchopulmonary dysplasia secondary to hyaline membrane disease. Afterwards, the two sisters had similar respiratory history; first, asthma with exacerbations related to viral infections in infancy, then at the age of 6, developing respiratory allergies to various aeroallergens with symptoms of seasonal rhinitis and persistent atopic dermatitis. Despite treatment with high doses of inhaled corticosteroids in combination with long-acting β_2-mimetics and delayed-release theophylline, their asthma remained poorly controlled. Repeated severe exacerbations (>10 hospitalizations between 4 and 8) led to several stays in the mountains for climatic treatment. In 1998 at the age of 12, the twins were enrolled in a 32-week randomized, double-blind, placebo-controlled study (4). One received omalizumab and the other a placebo. The twin receiving omalizumab was able to reduce her long-term treatment with fluticasone to 500 μg/day, while the other required treatment with fluticasone at a dose of 1250 μg/day and regular courses of oral corticosteroids due to persistent exacerbations. They were both then treated with omalizumab during a 6-year extension phase. During this time, there was clinical improvement with the absence of hospitalizations for severe attacks, disappearance of pollen-induced rhinitis and improved respiratory function (Fig. 1) under reduced long-term treatment with fluticasone 500 μg/day and occasional administration of oral corticosteroids. The adult height of the twin who first received omalizumab was 159 cm compared with 156 cm for the other.

The effectiveness of omalizumab in adolescents has previously been demonstrated in a pooled analysis showing that the relative risk of an adolescent aged between 12 and <18 presenting an asthma exacerbation when treated with omalizumab was 0.470 compared with the control group (95% CI: 0.318–0.695; $P = 0.0002$) (5). Our observation of monozygotic twins one treated with omalizumab and the other with a placebo for 32 weeks, then both with omalizumab for 6 years, and living in the same environment, supports these findings and suggests the effectiveness of omalizumab on a specific phenotype of severe asthma.

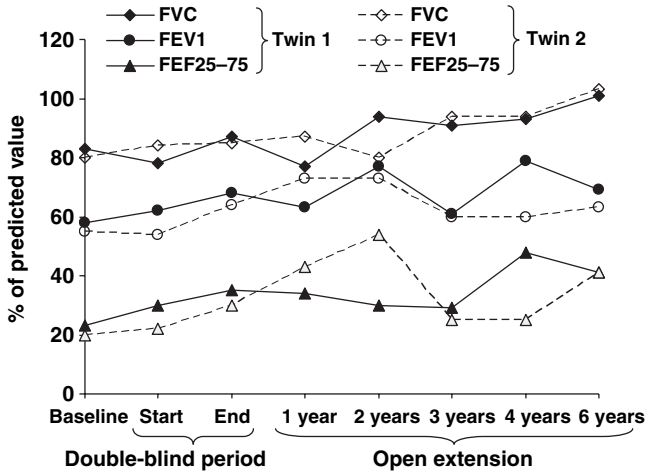

Figure 1. Change in respiratory function: observation of monozygotic twin sisters treated for 6 years with omalizumab. Twin 1, treated with omalizumab from the start. Twin 2, treated with the placebo and then omalizumab.

Moreover, treatment with omalizumab produced progressive improvement in respiratory function in these twins which was not significantly demonstrated in the core study. The improvement in respiratory function in these complex cases of obstructive bronchopathy, in part linked to a history of severe neonatal respiratory disease, could be explained by: (i) a strong allergic phenotype associated with severe allergic asthma, pollen-induced rhinitis and atopic dermatitis and (ii) the particularly prolonged duration of treatment with omalizumab.

The second distinctive feature of these observations was the possibility of reducing doses of inhaled corticosteroids earlier, particularly in the twin who received omalizumab from the start, at puberty, a crucial age for growth. It has been recognized, moreover, that the high-dose corticosteroid therapy required to control severe asthma can cause growth retardation (6).

These observations suggest the beneficial effects of treatment with omalizumab in severe allergic asthma (i) on respiratory function when there is a strong allergic phenotype and treatment is continued over a long period and (ii) on maintaining the height/weight growth curve compared with prolonged treatment with high doses of inhaled corticosteroids, particularly during puberty.

*Centre d'Investigation de l'Asthme et des Allergies
Hôpital d'Enfants Armand Trousseau
75012 Paris
France
Tel.: +33 1 44 73 5381
Fax: +33 1 44 73 5635
E-mail: jocelyne.just@trs.aphp.fr

Accepted for publication 8 December 2006
Allergy 2007: 62:453–454
© 2007 The Authors
Journal compilation © 2007 Blackwell Munksgaard
DOI: 10.1111/j.1398-9995.2006.01314.x

References

1. Gerritsen J, Koeter GH, Postma DS, Schouten JP, Knol K. Prognosis of asthma from childhood to adulthood. Am Rev Respir Dis 1989;**140**:1325–1330.
2. Los H, Koppelman GH, Postma DS. The importance of genetic influences in asthma. Eur Respir J 1999;**14**:1210–1227.
3. Sarafino EP, Goldfedder J. Genetic factors in the presence, severity, and triggers of asthma. Arch Dis Child 1995;**73**:112–116.
4. Holgate ST, Chuchalin AG, Hébert J, Lötvall J, Persson GB, Chung KF et al. Efficacy and safety of a recombinant anti-immunoglobulin E antibody (omalizumab) in severe allergic asthma. Clin Exp Allergy 2004;**34**:632–638.
5. Bousquet J, Cabrera P, Berckman N, Buhl R, Holgate S, Wenzel S et al. The effect of treatment with omalizumab, an anti-IgE antibody, on asthma exacerbations and emergency medical visits in patients with severe persistent asthma. Allergy 2005; **60**:302–308.
6. Wolthers OD. Growth problems in children with asthma. Horm Res 2002;**57**(Suppl. 2): 83–87 (Review).