

Lupin flour anaphylaxis

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In August, 2004, a 25-year-old woman was transferred to hospital following a restaurant meal of chicken, French-fried potatoes, and onion rings. During the meal, her mouth itched and her lips and tongue started to swell. Fifteen minutes later she was having difficulty breathing, her throat had narrowed, and she felt very weak. An ambulance was called, anaphylaxis diagnosed, and she was given intramuscular adrenaline. In spite of this treatment she continued to deteriorate and during the journey to hospital required continuous oxygen and two further doses of adrenaline. On arrival, intravenous fluids, hydrocortisone, and chlorpheniramine were given, and she recovered without further complications. She had a history of mild asthma and at the age of 15 had had severe anaphylaxis after eating a peanut. Occasional minor allergic reactions had occurred since then due to inadvertent peanut ingestion. Peanut contamination of the meal was therefore considered the most likely cause of her anaphylaxis. The restaurant chef assured her that this was unlikely and referred her to the onion ring distributor.

They informed her that lupin flour, an ingredient of the batter, might have caused her attack. An allergy consultant (HMB) contacted the company and the Anaphylaxis Campaign (info@anaphylaxis.org.uk) who suggested allergy clinic referral. Skin prick tests were done to common inhalant allergens but only birch pollen was positive. The skin prick test to peanut (1:10 dilution of the standardised extract) was strongly positive, and the patient had positive reactions to garden pea and soya. Skin prick tests to Brazil nuts and hazelnuts were negative. A crude 1:100 w/v volume eluate of lupin was prepared by mixing lupin flour with sterile isotonic saline. A skin prick test was strongly positive (weal diameter 14 mm). Specific IgE to lupin (12.5 kUA/L; reference range, <0.35 kUA/L) was identified by the UniCAP test (Pharmacia Diagnostics, Uppsala, Sweden). The patient was unwilling to undergo an oral challenge.

IgE-mediated food allergy is an important cause of dangerous anaphylaxis. Peanuts, tree nuts such as Brazil nuts, cashew nuts, or hazelnuts, and seafood, are the commonest causes in adults. The first report of lupin allergy was in 1994 and involved a 5-year-old girl with a known peanut allergy who developed urticaria and angioedema after eating spaghetti fortified with lupin flour.¹ Lupin flour allergy has been mainly reported in European patients known to be allergic to other legumes, particularly peanut, soya or pea.²⁻⁵ The first report of lupin anaphylaxis was in 1999.³ The prevalence of lupin allergy has increased markedly in some

countries, especially in France, where the addition of lupin flour to wheat flour was first permitted in 1997.² In 2002, lupin was the fourth most frequent cause of severe food-associated anaphylaxis reported to the French Allergy Vigilance Network. Three cases of anaphylaxis due to lupin have been reported from Australia, where over 800 000 tonnes is grown annually. Although mainly in use as an animal feed, since 2001 it has been increasingly supplied to food manufacturers as a substitute for the more expensive traditional cereal grains. The Australian Department of Agriculture is proposing lupin as the next major competitor to soya beans. The use of lupin for human food has been permitted in the UK since 1996. A new directive on food labelling came into force in Europe in November 2004 (2003/89/EC) requiring food manufacturers to specifically list 12 potentially allergic ingredients (gluten, fish, crustaceans, eggs, peanuts, soy, milk and dairy products, nuts, celery, mustard, sesame seed, and sulphites), and their allergenic derivatives. Lupin flour is not included in this listing in spite of a recommendation from the UK-based Institute of Food Science & Technology.

The Food Standards Agency has advised us that it is difficult to assess the scope of its current use, but until recently, lupin flour was limited to certain baked goods imported from Europe. However, two of us (MJR and GKS) have since identified a further case of life-threatening anaphylaxis caused by lupin flour in an Italian apple tart and are investigating two other possible cases. Without knowledge of lupin flour allergy all of these episodes would have been misdiagnosed as idiopathic anaphylaxis. Further work will be required to establish the prevalence and significance of lupin food allergy. Meanwhile, those with peanut allergy (around 1% of the UK population, including 250 000 pre-school children) appear to be at particular risk as up to half may be pre-sensitised. These people should be advised to avoid all products containing lupin until they can be specifically tested.

References:

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Figure: Lupin flour was present in the onion ring batter