

Sesame allergy in Britain: A questionnaire survey of members of the Anaphylaxis Campaign

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Sesame is a major allergen in countries where it is a common food. It was noted that an increasing number of members of the UK charity, the anaphylaxis campaign, were reporting allergy to sesame. This study, sought to examine features of sesame allergy among members of the Anaphylaxis Campaign (which supports those at potentially life-threatening risk from allergies) focusing on clinical symptoms and features of the foods implicated. A physician-designed questionnaire was sent by post to 400 members of the Anaphylaxis Campaign who reported avoidance of sesame. Two hundred and eighty replies were received (70%). Twenty-three replies (7%) were excluded and 96 replies (24%) came from subjects who avoided sesame but had never reacted to it. One hundred and fifty people (54%) reported 288 reactions to sesame. 89% of reactive subjects reported other atopic diseases and notably 84% were also nut/peanut allergic. One in six (17%) had suffered potentially life-threatening symptoms, with 65% of severe reactions happening on first known exposure. The age of first reaction ranged from 6 months to 65 yr. The majority of reactions reported (91%) involved foods or dishes which had sesame as a deliberate ingredient, rather than sesame as an accidental contaminant.

Respondents represented a well-informed and highly selected group of people at risk from potentially life-threatening allergies. Sesame should be identified clearly as an ingredient and separately from nuts and peanuts when it may be an allergen contaminant. People at potential risk need clear allergy diagnosis and informed guidance to enable them to avoid this key allergen more easily.

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Sesame allergy has been identified mainly in populations where sesame is widely consumed: Israel (1), Asia (2), Australia (3) and Italy (4). However, it is also clearly a hazard in countries where its consumption is less common. Sesame seeds were responsible for 3% of life-threatening allergic reactions to foods in France in 2002 (5). The French national databank of people with clinically confirmed food allergic reactions in 2002 indicates a prevalence of sesame allergy of 2.14% in children and 5.81% in adults (6).

The Anaphylaxis Campaign is an UK national patient membership organisation and registered charity that supports those at risk of potentially

life-threatening allergies. It manages a database of approximately 7600 members, which is used to create mailing lists. These are used to alert member subgroups avoiding particular allergens to their possible presence, usually when they are unlabelled ingredients or contaminants. In 2003, over 77,000 mail alert letters were sent out (two products containing unlabelled sesame or with a risk of sesame contamination were the subject of full alerts in 2000 and two more in 2003).

Allergic reactions to sesame used in foods and cosmetics/toiletries have been reported to the Anaphylaxis Campaign since its earliest days in 1994, and it was noted with concern that the

number of members avoiding sesame had increased from about 400 in April 2002 to 800 in December 2003, while the total membership had only increased from 7000 to 7600 during this time. This study sought to examine features of sesame allergy among members of the Anaphylaxis Campaign, focusing on clinical symptoms and features of the foods implicated.

Methods

In April 2002, the Anaphylaxis Campaign sent a questionnaire to members on its database who had indicated that they were avoiding sesame. Symptoms were classified (Table 1) and graded using the well-recognised schemes of Mueller (7) and Clark and Ewan (8).

The food allergen triggers were classified into four types. All foods in which sesame was an obvious ingredient were classified as type 1 (e.g. burger bun covered with sesame seeds, rice cake containing sesame), type 2 were foods known to contain sesame as a key ingredient (e.g. hummus, halva, tahini, sesame snap bars), type 3 were foods not known to contain sesame as an ingredient, but which may have been cross-contaminated by it during preparation (e.g. hot cross bun, cheese sandwich) and type 4 when the sesame content was uncertain (e.g. a Chinese meal may have contained sesame as an ingredient or contaminant even when the allergic person had asked for it to be sesame free).

Data from returned questionnaires were manually entered into an Excel spreadsheet (Microsoft Corp, Redmond, WA, USA) with all queries referred to the physician (J.H.). Descriptive analyses were performed and categorical data were analysed using chi-squared testing, with a two-tailed *p*-value of <0.05 being considered significant.

Results

Questionnaires were sent to 400 Anaphylaxis Campaign members and 280 (70%) were

returned. Of these 10 replies were excluded because they had been returned on behalf of a person over 16 (i.e. third party). Further 13 respondents were excluded because they do not actually avoid sesame; the remaining 257 respondents avoid sesame. Ninety-six respondents avoid sesame but have not reacted to it. Of the 161 respondents, 11 reported reactions that were not clearly attributable to sesame. This left 150 subjects (54% of respondents) with clear reports of reactivity to sesame (Fig. 1). Sixty-nine subjects had not been clinically assessed for sesame allergy. In order to include information in this study about their reactions, we compared their reported atopic profile (i.e. rate of other common allergic conditions: asthma, eczema, hayfever) with that of the group that had been tested. There was no significant difference between the two groups. ($p > 0.20$). In the same way, the atopic profile of the group avoiding sesame but who had not reacted was compared with the group who had reacted. Once again, there was no significant difference between the two groups (asthma $0.10 < p < 0.20$; eczema and hayfever $p > 0.20$). Of the 150 people who had reacted to sesame, there were more boys than girls and more women than men (41% boys under 16 to 27% girls and 7% men to 24% women). This profile has also been noted for other food allergens such as peanut.

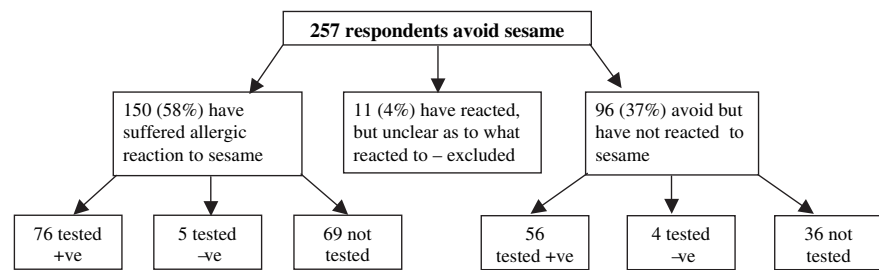
Eighty-nine per cent of sesame reactors reported other atopic conditions: 93 (62%) had asthma, 95 (63%) had eczema and 70 (40%) had allergic rhinitis. Of the 47 adults who had reacted to sesame, 12 reported no other atopic condition. A remarkably high number (91%) reported other food allergies (Fig. 2) although this might be expected from this patient/member group, with a preponderance of young subjects. The monoallergics were almost equally split between seven adults and six children. A total of 126 subjects (84%) reported coexisting nut and/or peanut allergy (Fig. 2). Forty-nine per cent (children < 16 yr) and 14% (adults) had asthma ($p < 0.01$). A 49% (children) and 15% of adults had eczema ($p < 0.01$). A 30% (children) and 17% (adults) had rhinitis ($0.10 < p < 0.20$).

The 150 respondents described 288 reactions to sesame. The questionnaire requested information on up to four reactions recorded in chronological order. Eighty-two (55%) reported only one reaction, 27 (18%) reported two, 12 (8%) three and 29 (19%) four or more reactions. Of the respondents who had had only one reaction to sesame, 69% were aged under five at the time of the reaction. Eighteen per cent were aged 5–15

Table 1. Clinical features reported on most recent reaction to sesame

	No. of respondents (150)	%
Skin rash/itching	77	51
Facial swelling/mouth/lips	106	71
Respiratory/wheeze	48	32
Vomiting	26	17
Abdominal pain/GI	36	24
Faint	3	2
Anaphylaxis	27	18

Fig. 1. Comparison of testing in sesame avoiders. Positive: reported a positive skin prick-test and/or blood test to sesame. Negative: respondent reported a negative skin prick test and/or blood test to sesame.



+ve: reported a positive skin prick test and /or blood test to sesame.

-ve: respondent reported a negative skin prick test and /or blood test to sesame.

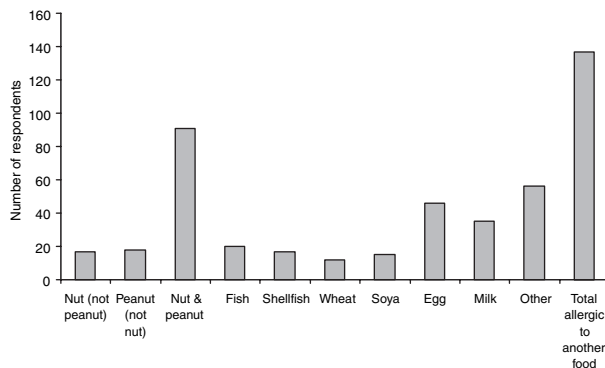


Fig. 2. Co-existing allergies in respondents allergic to sesame.

and 13% were adult (above 16 yr). The oldest first reaction was in a woman of 65 yr. Eight of 82 (10%) of first reactions were potentially life-threatening (graded Mueller four or Clark/Ewan 5) including two babies under the age one.

The majority of first reactions were moderate (55 of 82 Mueller 2 and 3) (63 of 82 Clark/Ewan 2, 3 and 4), leaving 19 of 82 Mueller 1 and 11 of 82 Clark/Ewan 1 mild. Two babies reacted to skin contact at 6 and 9 months. In one case, the baby broke out in hives after his brother touched him with sticky hands covered in hummus. In another the breastfeeding mother was eating hummus when some dropped on the baby's face, causing hives and puffy eyes. In 28 of 82 first reactions were to type 1 foods (e.g. burger bun, bread, rice cake, breadstick) and 53 of 82 to type 2 foods (e.g. hummus, sesame bars, tahini). All nine children who reacted under 1 yr of age (11%) had either reacted to hummus or tahini.

Clinical features reported on the most recent reactions to sesame are recorded in the Table 1.

In 90% of cases, sesame was clearly a deliberate ingredient in the food eaten (Fig. 3).

49% of the sesame-containing foods believed to have triggered symptoms were from a supermarket, 26% from a restaurant or take-away and 19% from somewhere else (including health food

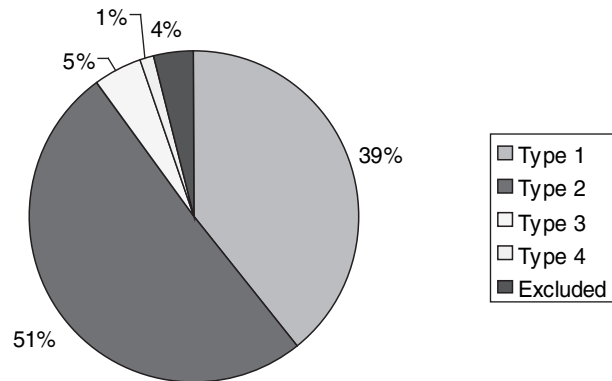


Fig. 3. Food triggering a reaction. Type 1 foods contained sesame as an obvious ingredient and triggered 113 of 288 reactions (e.g. burger bun covered with sesame seeds, rice cake containing sesame). Type 2 foods were foods known to contain sesame and triggered 146 of 288 reactions (e.g. hummus, halva, tahini, sesame snap bars). Type 3 foods were not known to contain sesame as an ingredient, but which were known to have been cross contaminated by it during preparation and triggered 14 of 288 confirmed reactions to sesame (e.g. hot cross bun, cheese sandwich). Type 4 foods were those for which the sesame content was uncertain. They triggered four of 288 reactions (e.g. a Chinese meal may have contained sesame as an ingredient or contaminant even when the allergic person had asked for it to be sesame free).

stores, organic and local shops, burger vans and other people's homes).

Discussion

Sesame appears to be an internationally common food allergen and these data confirm it is just as significant in the UK, where its use is largely confined to non-staple foods that should be easily identifiable. Sesame is used deliberately in relatively few foods and is known to be an allergen contaminant in others, particularly Chinese dishes and bakery items. As a contaminant, sesame seeds are difficult to control. They often become 'electrostatic', causing the seeds to cling to charged surfaces such as other foods and uniforms, which makes it difficult to control

them and prevent cross-contamination. The seeds can be easily transferred in food production (J. Obringer, Jacobs Bakery, UK, pers. comm.).

It is important to note that most reactions (91%) were to foods where the 'sesame risk' could be considered high, so the issue of contamination covered by the unsatisfactory 'may contain' labelling appears less critical to sesame allergic subjects than labelling of 'obvious' or 'expected' sesame. However, in a situation analogous to peanut allergy, most reactions in infants were to sesame-containing weaning foods, not widely available until recently: hummus and tahini. Adults reacted mainly to bread and burger buns, as well as to hummus, tahini, halva, sesame oil in oriental dishes and sesame snaps.

This study surveyed a highly selected group of people at risk from potentially life-threatening allergies. The sesame allergic subjects appear to be broadly atopic with a huge majority (90%), even among adults, also allergic to other foods, especially peanuts and tree nuts. This finding differs slightly from the French data, where only 60% of sesame allergic patients were otherwise atopic (5). This may reflect either that these subjects are especially likely to be sensitized to specific allergy to seed storage proteins such as 2S albumins (9), which we could not test in this observational study, or merely that subjects with food allergy, especially children with peanut or nut allergies, are often allergic to more than one food.

Although we did not analyse in depth the subjects who avoided sesame but had not reacted to it, 56 of 96 (58%) had evidence of sensitization on IgE testing (Fig. 1). It seems that families may already have decided their children with other food allergies should avoid sesame. Thirty-one of 96 voluntarily avoided sesame on the advice of a health professional or the Anaphylaxis Campaign. Doctors, nurses and others may well have suggested that a severely atopic child should avoid contact with sesame until they are older, particularly if they are or seem to be nut/peanut allergic. This appears to be reasonable advice if there is evidence of sensitization but no existing history of safe consumption of sesame.

Like members of the 'big 8' major food allergens, sesame may trigger the full range of symptoms in subjects of all ages, including full anaphylaxis/collapse on first known reaction in 10 of 150 children and six of 150 adults, in this series. In total, 17% of people who had reacted to sesame had suffered potentially life-threatening symptoms.

Some respondents experiencing repeated severe reactions to sesame had a range of other

food allergies and may have been unable to work out that sesame was the trigger. Others were unaware that sesame was an allergen or that it was an ingredient in what they had eaten. Without adequate clinical diagnosis including appropriate allergy testing and professional dietary advice on allergen avoidance, growing numbers of people with multiple food allergies find it difficult to avoid repeated severe reactions.

It is notable that only 54% of subjects who reported reactions had had any clinical tests for evidence of IgE sensitization, which were positive in 97% of cases. When these data are examined alongside data showing confusion about what foods constitute a high risk of sesame exposure, it appears that medical awareness and support of sesame allergic subjects in the UK are at an even lower level than for peanut and tree nut allergic subjects (10, 11).

The obvious limitations of this simple, descriptive study are that the group was self-selected, comprising the highly motivated membership of the Anaphylaxis Campaign and no challenge testing was used to confirm the diagnosis. Notwithstanding these features, the profile of positive test results reported and the atopic profile reported appear consistent with rates for other food allergies in the UK population (10–12).

As new products and recipes are being introduced from around the world on a regular basis, it is essential that those at risk are able to unravel menus and ingredient lists and to obtain information about allergens used as ingredients and as potential contaminants. Sesame is neither a staple food in the UK diet nor a valuable substitute protein source (e.g. as soya has been used for cows' milk). It is a required ingredient in a relatively small number of dishes and products and ought easily to be avoided. People wishing to avoid sesame to prevent reactions do need to be aware of the relatively few key foods and recipes which traditionally contain it. Sesame will need to be labelled when it is used as an ingredient in pre-packed foods under the new EU Directive 2003/89. However, many of the key products and dishes containing sesame are sold loose (e.g. in bakeries and delicatessens) and in restaurants and take-away meals where ingredients may not be identifiable and where cross-contamination may be more likely. When sesame is a possible contaminant in pre-packed foods, it is essential that this is indicated separately from any nut or peanut contamination risk. Generic nut/peanut/sesame contamination labelling is not helpful for the 16% of subjects who are avoiding sesame but not nuts, or for the even greater numbers of nut

or peanut allergic people who can eat sesame without problem.

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