

# Adult onset restricted fish allergy

Fish allergy is an important cause of IgE-mediated food allergy, with clinical manifestations ranging from urticaria/angioedema to anaphylaxis.<sup>1,2</sup> The traditional advice to patients with proven IgE-mediated fish allergy is to avoid eating all fish species, but this may be excessively restrictive,<sup>3,4</sup> as illustrated by our case.

A 64-year-old male fisherman was referred for assessment following two systemic reactions. The first reaction occurred after eating barramundi, and the second after eating ling. Both reactions were associated with hypotension, loss of consciousness and widespread urticaria.

The patient had previously eaten a wide variety of fish, including barramundi and ling, without any reactions. Furthermore, he had eaten other fish without incident between the two reactions. There was no history suggestive of other IgE-mediated food allergies, food-chemical sensitivity, other atopic symptomatology, or other obvious precipitants for his reactions.

Physical examination was unremarkable, and baseline spirometry was reasonable (FEV1/FVC of 2.62/3.77 (81%/92% predicted respectively)) with no change after bronchodilators. Serial PEFR measurements over 24 hours revealed less than 10% diurnal variation.

Skin prick testing (SPT) was performed with freshly prepared extracts of various fish and seafood, and commercial extracts (Bayer, Pymble, NSW) of fish mix, staple foods, and routine aeroallergens (see Table 1).

Open oral challenges were subsequently performed under closely supervised conditions, with full cardiopulmonary resuscitation facilities and drugs (eg adrenaline) immediately available. Respiratory examination, pulse, blood pressure and spirometry were performed prior to the challenge, and repeated at half hourly intervals throughout the duration of the challenge. Initially a small (approximately 1 g) piece of fish or seafood was eaten. Progressively larger pieces of fish or seafood were then consumed at half-hourly intervals, until a total of five pieces (total weight approximately 38 g) had been eaten without incident or a significant drop (greater than 20% from pre-challenge baseline) in spirometry occurred.

A positive challenge was defined as a greater than 20% drop in spirometry from the pre-challenge baseline, or the development of obvious symptoms such as urticaria. At this time oral loratadine (10 mg) and nebulised salbutamol (5 mg) were administered. Half-hourly observations and spirometry were then performed for a further three hours, after which the

TABLE 1  
Results of Skin Prick Tests (SPTs) and Oral Open Challenges

| Positive skin prick tests* |                             | Negative skin prick tests |                             |
|----------------------------|-----------------------------|---------------------------|-----------------------------|
| Allergen                   | Oral open challenge result† | Allergen                  | Oral open challenge result† |
| Fish mix‡                  | Not done                    | Mullet                    | Negative                    |
| Barramundi                 | Not done (see text)         | Flathead                  | Negative                    |
| Ling                       | Not done (see text)         | Red salmon                | Not done                    |
| Redfish                    | Positive                    | Perch                     | Not done                    |
| Snapper                    | Negative                    | Leather jacket            | Not done                    |
| Bream                      | Negative                    | Whiting                   | Not done                    |
| Kingfish                   | Not done                    | Rainbow trout             | Not done                    |
| Calamari                   | Positive                    | Sardine                   | Not done                    |
| House dust mite            | Not done                    | Flake                     | Not done                    |
|                            |                             | Mussel                    | Not done                    |
|                            |                             | Prawn                     | Not done                    |
|                            |                             | Scallop                   | Not done                    |
|                            |                             | Crab                      | Not done                    |
|                            |                             | Octopus                   | Not done                    |
|                            |                             | Oyster                    | Not done                    |
|                            |                             | Staple foods**            | Not done                    |
|                            |                             | Pollens                   | Not done                    |
|                            |                             | Moulds                    | Not done                    |
|                            |                             | Animal dander mix         | Not done                    |

\*Positive skin prick test defined as an average wheal diameter (measured in two perpendicular directions) exceeding 3 mm.

†Positive challenge defined as a >20% drop in spirometry (FEV1/FVC) from baseline, or the development of obvious symptoms such as urticaria.

‡Codfish, halibut, mackerel, perch, salmon, trout and tuna.

\*\*Wheat, egg white, milk, nuts, soybean.

patient was only discharged if his spirometry had reached baseline levels and was stable for two consecutive readings. Otherwise, the patient was further observed until his spirometry had stabilised.

The results of the challenges are shown in Table 1. He was not challenged with barramundi or ling in view of his recent systemic reactions with these fish. Interestingly, the oral challenges to snapper and bream (which produced positive SPT results) were negative.

The patient was therefore instructed to carry an Adrenaline Epi-Pen at all times, and to avoid eating and handling barramundi, ling, redfish, calamari, and any other species of fish or seafood to which he had not yet been SPT/challenged. He would also avoid all commercially prepared fish/seafood because of the risk of cross-contamination during processing. However, he was allowed to eat snapper, bream, mullet and flathead, which he has done without incident. Two years after his last challenge, he was still complying with these instructions and has not had any further reactions.

Cross-reacting antigens<sup>1,3-6</sup> have been described between different fish species eg. the 12-13 kDa codfish antigen Gad c I.<sup>6</sup> These findings may explain why individuals allergic to one species of fish are often found by SPT and/or IgE RAST (radioallergosorbent test) studies to possess IgE antibodies to other fish species.<sup>3,4</sup>

Nevertheless, serological antigenic cross-reactivity appears to be less relevant clinically. Bernhisel-Broadbent *et al.*,<sup>3</sup> studied 11 people with histories of fish allergy, and while all had positive SPT to between eight to nine different fish, only three had more than one positive double-blind, placebo-controlled oral challenge. Another study also reported that while children with codfish allergy often had positive SPT to other fish, consumption of these fish did not always produce reactions.<sup>4</sup>

Our single case further supports the findings of Bernhisel-Broadbent *et al.*,<sup>3</sup> illustrating that proven IgE-mediated allergy to one or more species of fish does not necessarily require avoidance of all fish species. However, patients should be assessed by an experienced Clinical Immunology/Allergy clinic to determine which species of fish the patient may safely eat, because of the risk of systemic reactions/anaphylaxis during oral challenges, and the patient should be known to be capable of identifying the different fish species correctly.

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### References

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### CORRIGENDUM

Re: Karapetis CS, Patterson WK, Pittman KB, Kotasek D, Sage RE. 'Treatment of Metastatic Breast Cancer with Continuous Infusional 5 Fluorouracil' *Aust NZ J Med* 1999; 29: 517-522

On behalf of all the authors I wish to highlight an error that appeared in our recently published article. In the final paragraph of the Results section the second sentence begins 'Three (12.5%) patients were alive at one year following commencement of CI-5FU . . .'. This is incorrect and contradicts the correct data as described in the abstract; 'The survival rate at one year was 21% (five of 24) . . .'. We apologise for this error.

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