

Introduction

- The natural history of seafood allergy is not well understood, although it is believed that most seafood allergies are persistent.
- There are no 50% negative predictive value (NPV) cutoffs established for food-specific IgE (FSIgE) levels to recommend an oral food challenge (OFC) for fish or shellfish

Objectives

- Identify clinical characteristics in children with fish or shellfish allergy who were most likely to experience a negative OFC.

Methods

- Retrospective chart review for children aged 21 years or younger who had a graded OFC to seafood at a Midwest pediatric tertiary care center from 2008 through 2019.

Results

- 63 OFCs were performed; 21 were fish and 42 were shellfish.
- 78% had a negative OFC, whereas 22% either refused to complete the challenge (4/14) or had a clinical reaction (10/14).
- Based on the initial clinical reaction, most patients had a negative OFC if their presenting history was urticaria (18/49)
- 15/20 patients had a negative OFC based on sensitization
- 5/6 patients with a history of anaphylaxis had a negative OFC.
- 4 cases of anaphylaxis (2 fish, 2 shellfish) occurred
- There was a statistically significant difference between median FSIgE levels for negative (<0.34kU_A/L) versus positive (1.37 kU_A/L) OFCs for fish (p=0.023), but not for shellfish (p=0.272).
- A cutoff of 1.99 kU_A/L was associated with an NPV of 82.5%.

Conclusions

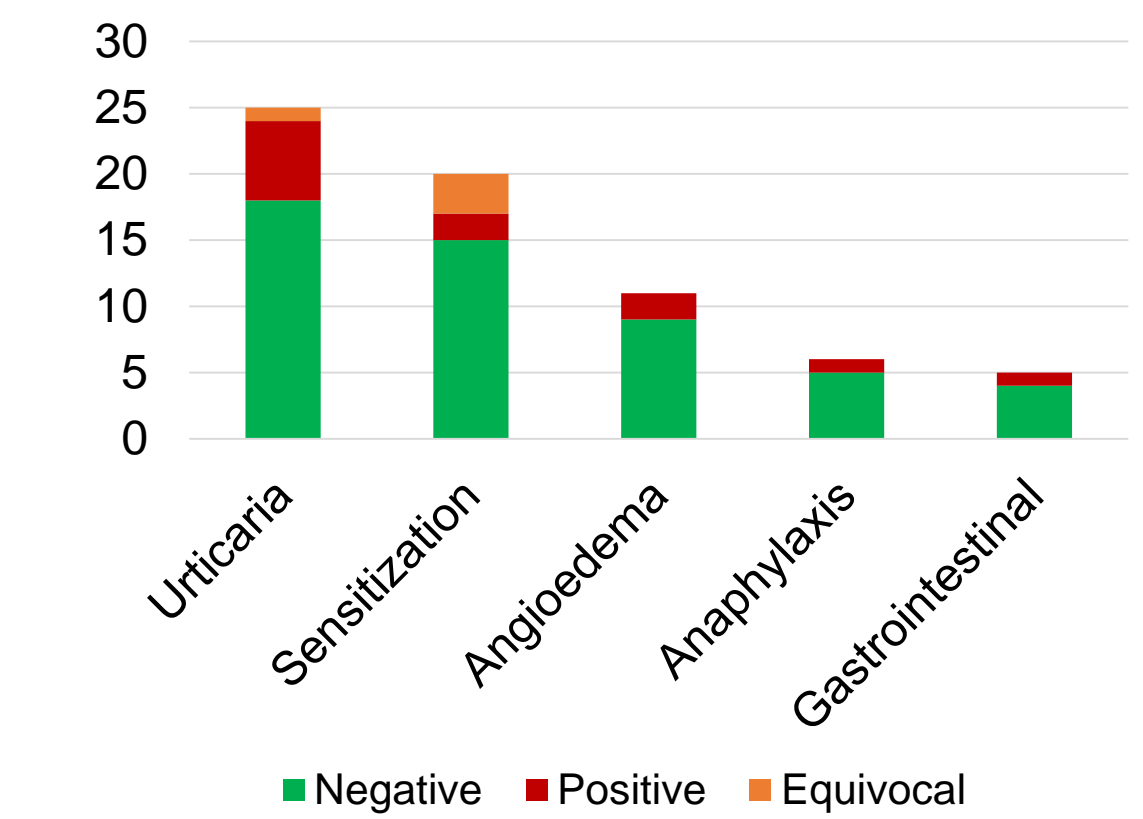
- A retrospective study of OFCs to seafood showed that the rate of a positive OFC was low.
- While seafood allergy is rarely outgrown, children who have a low FSIgE level can successfully tolerate seafood.

Children are more likely to experience a negative oral food challenge to fish and shellfish than previously thought, even with a history of anaphylaxis.

Patient demographics (N = 63)

Male	60.32%
Female	39.68%
Average age (years)	8.08 ± 4.69
Caucasian	55.56%
African American	26.98%
Hispanic	4.76%
Asian	1.59%
Other ethnicity	11.11%
Fish allergy	33.33%
Shellfish allergy	66.67%
Allergic rhinitis	63.49%
Asthma	53.97%
Atopic dermatitis	31.75%
Multiple food allergies	49.21%

OFC outcomes based on initial reaction history



Patient demographics based on success of OFC

	Negative (N=49)	Positive (N=10)	Equivocal (N=4)	Total (N=63)	p-value
Average Age (years)	8.20 ± 4.90	8.50 ± 4.33	5.50 ± 2.38	8.08 ± 4.69	0.5238
Male	57.14%	60%	100%	60.32%	0.3001
Female	42.86%	40%	0%	39.68%	
Overall atopy	81.63%	100%	100%	85.71%	0.3946
Asthma	53.06%	60%	50%	53.97%	0.9011
Allergic rhinitis	61.22%	60%	100%	63.49%	0.3930
Atopic dermatitis	26.53%	50%	50%	31.75%	0.2486
Multiple food allergies	44.90%	50%	100%	49.21%	0.1397

OFC failure characteristics

	Fish (N=21)	Shellfish (N=42)	Total (N=63)
Positive challenge (% per food)	4/21 (19.05%)	6/42 (14.29%)	10/63 (15.87%)
Negative challenge (% per food)	16/21 (76.19%)	33/42 (78.57%)	49/63 (77.78%)
Equivocal (% per food)	1/16 (4.76%)	3/42 (7.14%)	4/63 (6.35%)
Reaction of Failure	Fish (N=4)	Shellfish (N=6)	Total (N=10)
Anaphylaxis	2/4 (50%)	2/6 (33.33%)	4/10 (40%)
Urticaria	2/4 (50%)	3/6 (50%)	5/10 (50%)
Angioedema	0/4 (0%)	1/6 (16.67%)	1/10 (10%)
Gastrointestinal symptoms	0/4 (0%)	1/6 (16.67%)	1/10 (10%)

SPT[§] and FSIgE[‡] results for passed versus failed OFCs

	Negative	Positive	Equivocal	p-value
Skin test to fish (% positive)	5/11 (45.45%)	1/1 (100%)	-	>0.9999
Skin test to shellfish (% positive)	11/24 (45.83%)	3/5 (60%)	2/2 (100%)	0.5640
Skin test to fish (wheal size)	0 (0 – 2.5)	15	-	0.0764
Skin test to shellfish (wheal size)	0 (0 – 3)	0 (0 – 5)	4.5 (4 – 5)	0.1695
Fish-specific IgE (kU _A /L)	0.34 (0.34 – 0.64)	1.63 (1.31 – 7.55)	0.34	0.0233
Shellfish-specific IgE (kU _A /L)	0.34 (0.34 – 0.34)	0.34 (0.34 – 0.34)	0.34 (0.1 – 0.34)	0.2724

§ SPT available for 12 fish and 31 fish patients
‡ FSIgE levels were available for all patients