

Risk Factors for Failed Infant Oral Food Challenges: A Retrospective Analysis

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BACKGROUND

- Demand for in-office oral food challenges (OFCs) to peanut and other foods has increased following recent guidelines for peanut introduction in infants [1].
- Previous studies identified specific IgE and skin-prick test decision points for cow's milk, hen's egg, and peanut above which 95% of children >2 years of age react. [2] Decision points for infants <2 years of age have also been published but are not as well-validated given the paucity of data available in this very young age group.
- The HealthNuts study demonstrated that severe reactions during infant OFCs are rare [3]. Urticaria was the most frequent symptom reported, while peanut most frequently elicited severe reactions.
- Our study objectives were to characterize clinical outcomes in infant OFCs, including frequency of severe reactions, and to assess factors (age, SPT wheal diameter, sIgE level, and others) that may help predict failed challenges.

METHODS

- We retrospectively reviewed all physician-supervised infant OFCs in one center over a period of 22 months. All children under 18-months undergoing OFC based on clinician assessment were included in the study.
- Failure was defined as any symptoms requiring cessation of feeding and/or treatment.

REFERENCES

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- Järvinen KM, Sicherer SH. Diagnostic oral food challenges: procedures and biomarkers. J Immunol Methods. 2012 Sep 28;383(1-2):30-8.
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Figure 1. Foods Challenged in 146 Infant OFCs

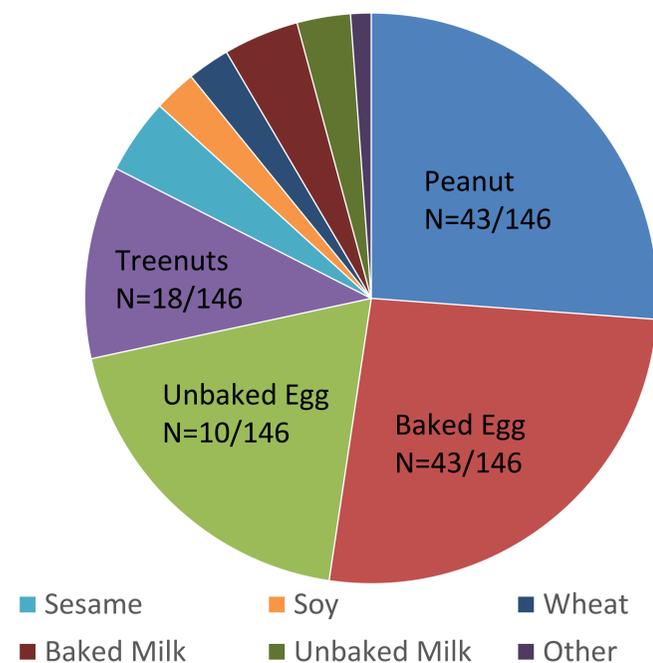
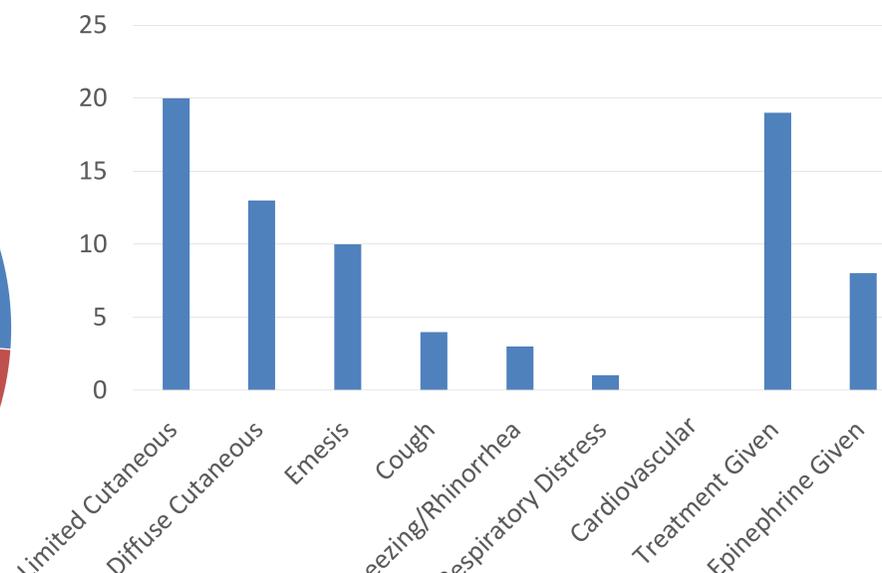


Figure 2. Signs/Symptoms in OFC Failures (N=39/146)



Most reactions were limited cutaneous, however 8/39 had two-system involvement, emesis or diffuse cutaneous symptoms requiring epinephrine. One case of respiratory compromise occurred in a child with reactive airway disease.

Table 1. Overall Data for Most Frequently Challenged Foods

	MEDIAN AGE (months)	PREVIOUS REACTION	POSITIVE TESTING ONLY	ECZEMA	MEDIAN SPT WHEEL (mm)	MEDIAN SPECIFIC IgE (kU/L)	MEDIAN OVOMUCOID IgE (kU/L, baked egg only)
PEANUT (N=43)							
Pass 63% (N=27/43)	9 (IQR 7-11)	41% (N=11/27)	59% (N=16/27)	73% (N=19/27)	3 (IQR 1-5)	1.15 (IQR 0.62-2.79)	
Fail 37% (N=16/43)	10 (IQR 9-14)	43% (N=7/16)	56% (N=9/16)	88% (N=14/16)	6 (IQR 6-7.75)	4.31 (IQR 3.13-5.5)	
BAKED EGG (N=43)							
Pass 79% (N=34/43)	11 (IQR 9-12.75)	59% (N=20/28)	29% (N=8/28)	89% (N=17/19)	4 (IQR 3-6)	1.58 (IQR 0.75-7)	5.29 (IQR 2.7-5.8) (12 patients tested)
Fail 19% (N=8/43)	9.5 (IQR 8.75-13)	38% (N=3/8)	63% (N=5/8)	83% (N=5/6)	6.5 (IQR 6-8)	8.46 (IQR 2-24)	<0.1, <0.1, 3.41 (3 patients tested)
UNBAKED EGG (N=10)							
Pass 80% (N=8/10)	12 (IQR 11-12)	50% (N=4/8)	50% (N=4/8)	88% (N=7/8)	4 (IQR 3-4.75)	0.83 (IQR 0.67-1.1)	
Fail 20% (N=2/10)	13.5 (IQR 12-15)	50% (N=1/2)	50% (N=1/2)	100% (N=2/2)	3.5 (Values 4 and 19)	1.13 (1 patient tested)	

RESULTS

- The median age of infants undergoing OFC was 11 months (IQR 9-13). 39/146 infant OFCs (26.7%) were failed. Peanut and baked egg were the most frequently challenged foods.
- The most common foods causing failed OFCs were peanut (N=16/43, 37.2%) and baked egg (N=8/43, 18.6%). Others included wheat (N=4/4), cow's milk (N=3/5), cashew (N=3/6), unbaked egg (N=2/10), sesame (N=2/7), and mustard (N=1/1).
- Factors not differing between "pass" and "fail" outcomes included:
 - Previous reactions (45.3% versus 33.3%)
 - Median age (11 versus 10 months)
 - Eczema (83% versus 87.2%)
 - Reactive airway disease/asthma (3.8% versus 0%)
 - Allergic rhinitis (3.8% versus 5.1%).
- Median wheals for peanut SPT differed between "pass" versus "fail" outcomes (3 mm, IQR 1-5; versus 7 mm, IQR 3-8), as did median peanut sIgE (1.15 kU/L, IQR 0.62-2.79; versus 4.31 kU/L, IQR 3.13-5.5).
- Median egg SPT differed between baked egg "pass" versus "fail" outcomes (median wheal 4 mm, IQR 3-6; versus 6.5 mm, IQR 6-8), as did median egg white sIgE (1.58 kU/L, IQR 0.75-7; versus 8.46 kU/L, IQR 2-24). Median ovomucoid IgE for "passes" was 5.29 kU/L, while just 3/8 patients who failed baked egg OFCs had ovomucoid IgE performed (2/3 were <0.1 kU/L, 1/3 was 3.41 kU/L).

CONCLUSIONS

- Our study demonstrates the relative safety of infant OFCs and identifies peanut and baked egg as high-risk foods for failed outcomes.
- The median skin-prick test and specific IgE values between passes and fails in our study support the utility of published decision points for children under 2 years of age to determine risk of challenge failure, however more infant data is needed.