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Learning Early About Peanut worries

Evaluation of parental PROMIS-29 anxiety scores during early peanut introduction clinics



Peanut allergy negatively affects health-related quality of life for patients and their caregivers.^{1–3} The National Institute of Allergy and Infectious Diseases (NIAID) addendum guidelines⁴ for early introduction of peanut represent a marked advancement in peanut allergy prevention. Nevertheless, appropriate application of NIAID guidelines remains difficult.⁵ Recent consensus statements for food allergy prevention⁶ suggest that screening for allergy in at-risk infants is not necessary. In addition, parental anxiety after implementation of these guidelines remains understudied. Our study sought to evaluate the effect of formalized evaluation in a peanut early introduction clinic on parental anxiety. We hypothesized that parents of infants sensitized to peanut based on skin prick testing (SPT) wheal size would report more anxiety owing to continued uncertainty and need for additional workup to confirm or rule-out peanut allergy.

Infants aged 4 to 11 months with egg allergy or moderate-to-severe atopic dermatitis (n = 107) were referred to the Allergy and Immunology Division at Ann and Robert H. Lurie Children's Hospital of Chicago and underwent evaluation in a specialized peanut early introduction clinic. A standardized template was used to obtain pertinent clinical history, and most patients were evaluated by a single provider. For infants who had never consumed peanut, SPT was performed. Patients determined to be without allergy based on SPT wheal size were instructed to introduce peanut at home, and patients determined to have allergy were advised to strictly avoid peanut. For those sensitized to peanut, parents were informed of possible peanut oral food challenge (OFC) to determine tolerance. All sensitized patients had additional testing including whole peanut-specific immunoglobulin (IgE) (sIgE) and component testing to Ara h 1, 2, 3, 6, 8, and 9 before official decision on offering peanut OFC. Peanut OFC typically occurred within a few months of the initial visit with dedicated slots reserved for patients who required early peanut introduction.

As part of a larger study described elsewhere,⁷ a parent completed the PROMIS-29 immediately after the clinical visit, including discussion of SPT results, plan, and food allergy education. The PROMIS-29 is a validated health-related quality of life questionnaire including physical function, anxiety, depression, fatigue, sleep disturbance, social participation, and pain interference domains⁸ with scores normalized to a mean *t* score of 50 ± 10 based on a representative sample of the general population. Higher scores on “negative” domains such as anxiety represent more symptoms.

The primary outcome was parental PROMIS-29 anxiety *t* score. Predictors of interest included classification of peanut allergy based on SPT wheal size according to NIAID guidelines (0–2 mm = non-allergic, 3–7 mm = sensitized, ≥ 8 mm = allergic) and which parent (mother or father) completed the PROMIS-29 measure. Univariable Wilcoxon ranked sum and Kruskal-Wallis analyses evaluated for associations between anxiety *t* score and predictors of interest, followed by multivariable linear regression. Additional covariates (infant's sex, age, parent-reported race, insurance status, and referral reason) were included in sensitivity analyses.

The mean age of subjects was 8 months, and most were of male sex. Infants were accompanied by their mothers for most visits. Complete demographics and clinical characteristics are summarized in Table 1. The median (IQR) parental PROMIS-29 anxiety *t* score for peanut without allergic (n = 53), sensitized (n = 39), and allergic (n = 15) infants was 40.3 (40.3–53.6), 52.1 (40.3–59.55), and 48.5 (40.3–54.1), respectively. Parents of peanut-sensitized infants had an average anxiety *t* score of 3.9 points higher than parents of infants without allergy (*P* = .03) when controlling for which parent completed the PROMIS-29 and which parent(s) were present at the visit. Fathers (n = 16) had lower median anxiety *t* scores compared with mothers (40.3 vs 48.2; *P* = .02). Sensitivity analyses revealed no differences when controlling for the infant's biological sex, age, race, insurance status, and referral reason.

This study provides evidence that increased parental anxiety in peanut-sensitized infants may be a potential unintended consequence of screening for peanut allergy. Our study used a validated measure of anxiety, the PROMIS-29, and is one of the first to use this measure in an acute stress scenario. Nevertheless, we only evaluated PROMIS-29 anxiety scores at 1 point in time, and anxiety *t* scores were relatively low overall. We did not compare changes in anxiety after sensitized infants underwent OFC. Consequently, we do not know if our findings represent only a transient increase in anxiety. We also did not include a control group of parents who were told to introduce peanut without testing. Although we did attempt to control for health inequities as confounders for parental anxiety, we acknowledge that our use of insurance status and parent-reported race do not fully represent the complexities that underlie each family's interaction with the healthcare system.

Our findings suggest that parents of infants sensitized to peanut, but not those with designation of peanut allergy, are more likely to have heightened anxiety immediately after initial evaluation when compared with infants without allergy. In addition, mothers tended to have higher anxiety scores than fathers, similar to previous studies investigating parental sex differences in perceived food allergy impact.⁹ Although the Learning Early About Peanut study¹⁰ revolutionized food allergy prevention, challenges remain translating these

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Table 1
Demographics and Clinical Characteristics of Entire Cohort (n = 107) Stratified by Peanut Allergy Status

	Non-allergic (n = 53)	Sensitized (n = 39)	Allergic (n = 15)
Age in mo, mean (SD)	7.66 (2.07)	7.82 (1.64)	8.40 (2.10)
Reason for referral, n (%)			
Both egg allergy and eczema	19 (35.8)	15 (38.5)	7 (46.7)
Eczema	14 (26.4)	12 (30.8)	5 (33.3)
Egg allergy	20 (37.7)	12 (30.8)	3 (20.0)
Male, n (%)	30 (56.6)	23 (59.0)	10 (66.7)
Self-identified race, n (%)			
White	26 (49.1)	21 (53.8)	4 (26.7)
Non-White	21 (39.6)	16 (41.0)	7 (46.7)
Missing	6 (11.3)	2 (5.1)	4 (26.7)
Medicaid insurance, n (%)	22 (41.5)	12 (30.8)	4 (26.7)
Guardian(s) present at visit, n (%)			
Mother	32 (60.4)	27 (69.2)	9 (60.0)
Father	4 (7.5)	1 (2.6)	0 (0.0)
Both parents	17 (32.1)	11 (28.2)	6 (40.0)
PROMIS-29 Anxiety T score, median (IQR)	40.30 (40.30–53.60)	52.10 (40.30–59.55)	48.50 (40.30–54.10)

Abbreviation: IQR, interquartile range.

findings into universal standards of care. Furthermore, although NIAID addendum guidelines recommend testing with either peanut SPT or sIgE before introduction in high-risk infants,⁴ some proponents for universal early allergenic food introduction suggest that avoidance of allergy testing may alleviate delays in incorporating these foods into the diet.⁶ In our study, parents of sensitized infants were told to avoid peanut until sIgE or OFC was completed. We hypothesize that these parents experienced increased anxiety related to continued diagnostic uncertainty, as compared with parents who were told that their child has either without allergy or with allergy to peanut at the time of the visit. We suspect that early peanut introduction without prescreening might mitigate acute anxiety related to initial allergist appointment and testing. Families with clinical uncertainty on peanut allergy diagnoses could also benefit from increased education, including clear communication and short wait times between initial visit and peanut OFC. Clinicians should be mindful of the potential extra stress that screening for peanut allergy in high-risk infants may have and account for this in a family-centered decision-making framework.

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