

**2021 AAAAI Annual Meeting Seminar:
Diagnostic Testing for Food Allergy in Patients with Atopic Dermatitis (AD)**

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Learning Objective: Analyze the utility of food-specific and component IgE testing to predict food allergy in patients with moderate to severe atopic dermatitis and elevated total serum IgE.

Case #1

3m old female for AD eval, exclusively breastfed

- Head to toe AD, has only tried emollients and bathing every 3 days
- 1m prior mom eliminated dairy from her diet → no change in AD
- 1w prior, PCP checked sIgEs (kU_A/L): peanut 4.18, egg 9.07, wheat 3.59 → refer

3.5m → skin well-controlled with soak and seal and topical steroids

- Skin prick test (SPT, mm): milk neg, egg white 9x7, wheat neg, peanut 6x4, soy neg

6m food allergy consult

- o What additional testing would you obtain?
- o What OFC(s) would you offer this patient and when?

Case #2

2y boy with severe atopic dermatitis, constant itching, very poor sleep. No routine skin care or topical steroids. Currently eating regularly and liking peanut butter, sesame seeds (tahini), egg, milk, wheat soy, cow's milk dairy, fish and shellfish. Eats almond in a cereal, but does not like it.

- SPT (mm): egg whole 8x3, peanut 16x9, sesame seed 20x12; milk, wheat, soy, fish mix, shellfish mix, corn, almond neg

1y later...skin initially improved with elimination diet, but returned to severe within 5d, so continued avoidance, but not strictly.

- Total IgE 298 IU/mL, vitamin D 19.5 ng/mL
- Based on the history and test results at age 3y, what, if any of the following would you offer?
 - o Additional testing
 - o Home introduction
 - o OFCs

Food	SPT (mm), 2y	SPT (mm), 3y	sIgE (kU _A /L)
Peanut	16x9	20x15	32.1
Egg	8x3 (whole)	9x7 (whole)	0.43 (white)
Sesame Seed	20x12	20x28	12.1
Almond	<u>Neg</u>	10x6	0.76
Walnut	ND	3x3	0.31
Pecan	ND	3x3	<0.1
Cashew	ND	15x15	3.7
Pistachio	ND	22x15	13.4
Hazelnut	ND	6x6	0.76
Brazil Nut	ND	<u>Neg</u>	0.19
Coconut	ND	3x3	ND

Case #3

7y girl with severe AD since infancy that has been difficult to control

- Avoiding multiple foods: peanut, tree nuts, sesame seeds, milk, egg, wheat, soy, shellfish, kiwi, sweet potato, pea, melon
- History of reactions to sweet potato, pea, cashew, pistachio, milk, wheat, kiwi, shrimp and oral allergy syndrome with melons
- Avoiding other foods based on sIgE testing, has never had SPT before

- Total IgE 4504 IU/mL, vitamin D 14.85 ng/mL

Food	sIgE, 2y	sIgE, 7y	SPT (mm), 7y
Milk	0.65	>100	18x5
Casein		>100	
Egg	4.5	>100	17x10
Ovomucoid		>100	
Wheat	1.22	22.4	4x3
Shrimp		27.8	20x9
Soy	3.46	8.79	5x4
Sesame Seed	6.85	25.7	neg
Sweet Potato	2.53	2.73	neg
Pea	1.28	3.26	8x5
Avocado	0.32	0.5	neg
Kiwi	<0.1	<0.1	4x4

Food	sIgE, 2y	sIgE, 7y	SPT (mm), 7y
Peanut	4.5	37.2	17x9
Ara h1		1.2	
Ara h2		1.5	
Ara h3		1.1	
Ara h8		25.6	
Ara h9		3.4	
Almond		8.19	10x8
Walnut			neg
Pecan			neg
Cashew		55.4	17x10
Pistachio		>100	15x11
Hazelnut		8.79	5x4
Brazil Nut		2.64	20x10
Coconut			neg

- Based on the history and test results at age 3y, what, if any of the following would you offer?
 - Home introduction
 - OFCs

Pearls

1. Before removing foods from the diet or testing for food allergies, optimize skin care including soak and seal therapy (regular bathing and frequent moisturizer use), with appropriate use of topical steroids.
2. Only test for foods based on history
 - a. Take advantage of the high negative predictive value of SPT (=better screening test)
 - b. Random screening is not useful
 - c. Obtain a total IgE in patients with AD
 - d. Food panels should never be used
3. Removal of a food allergen from the diet may lead to a temporary improvement in AD, but can reduce oral tolerance and lead to immediate reactions including anaphylaxis. So do not remove a food from the diet if it is being tolerated.
4. Be prepared to perform OFCs with (almost any level of) positive testing
 - a. Infants without a high pre-test probability of IgE-mediated food allergy
 - b. Patients with a high total IgE
 - c. Baked milk and egg OFCs for most or all patients
5. Begin to shift away from screening testing, regardless of risk, encouraging early introduction (~6-12m) of peanut and whole cooked egg, for all patients

References

1. Bird JA, Leonard S, Groetch M, et al. Conducting an OFC: An update to the 2009 adverse reactions to foods committee work group report. JACI IP. 2020;8:75-90.
2. Boguniewicz M, Fonacier L, Guttman-Yassky E, Ong PY, Silverberg J, Farrar JR. Atopic dermatitis yardstick: Practical recommendations for an evolving therapeutic landscape. Ann Allergy Asthma Immunol. 2018;120(1):10-22 e2.
3. Eigenmann PA, Beyer K, Lack G, Muraro A, Ong PY, Sicherer SH, et al. Are avoidance diets still warranted in children with atopic dermatitis? Pediatr Allergy Immunol. 2020;31(1):19-26.
4. Fleischer DM, Chan ES, Venter C, et al. JACI IP. 2021;9(1):22-43.e4.
5. Frischmeyer-Guerrero PA, Rasooly M, Gu W, Levin S, Jhamnani RD, Milner JD, et al. IgE testing can predict food allergy status in patients with moderate to severe atopic dermatitis. Ann Allergy Asthma Immunol. 2019;122(4):393-400 e2.
6. Greenhawt M, Shaker M, Wang J, et al. Peanut allergy diagnosis: A 2020 practice parameter update, systematic review, and GRADE analysis. JACI. 2020;146(6):1302-34.
7. Spergel JM, Boguniewicz M, Schneider L, Hanifin JM, Paller AS, Eichenfield LF. Food Allergy in Infants with Atopic Dermatitis: Limitations of Food-Specific IgE Measurements. Pediatrics. 2015;136(6):e1530-8.
8. Soak and Seal skin care video (including wet wrap demonstration): <https://youtu.be/WYyriyTTBG1>