Food Allergies and Testing

1. Associated with considerable medical, emotional, and socioeconomic burden
2. Standardized diagnostic tools:
   - Quantitative: ImmunoCAP Testing
   - Qualitative/Functional: Skin Prick Testing (SPT)
   - Gold Standard: Oral food challenge
3. “Sacrificial” tools and interpretation:
   - Mueller device, Hagedorn cutting needle, Multitest
   - Read-out: wheal (hive) and flare (erythema)
4. SPT confounders: age, medication, technique

Allergen/Antigen
Allergen-specific IgE
FcεRI
Granule

Temporal release of cell mediators:
Immediate:
- Histamine, dopamine, serotonin
- Trypsase, chymase, CP-A3
- Chemokines: TNFα

Minutes:
- Leukotrienes (Cys-LT)
- Prostaglandins (PGD2)

Hours:
- Cytokines: IL-4, -5, -6, -13, -17
- Chemokines: TNFα
- Growth factors: VEGF

Food Allergy and Immunotherapy Program; Baylor College of Medicine/Texas Children’s Hospital (Houston, TX)

Introduction

US: AAAAI and ACAAI
- Objective wheat-and-flare responses be recorded in millimeters (diameter or area) because cutoff levels (in millimeters) may obviate the necessity for confirmatory respiratory and food allergen challenge test
- All negative controls should be < 3-mm wheels and <10-mm flares

UK: EAACI and BSACI
- The largest diameter of the wheal of each particular test is measured, a positive being a wheal of ≥ 3 mm
- Measure the longest extent of the wheal (not including the flare) and the extent 90° to the first measurement.

Question: Are there universal guidelines for SPT interpretation?

Goal: Use a brief, four-question survey to evaluate differences in how allergists in the United States (US) and the United Kingdom (UK) evaluate the SPT result for food allergy diagnosis.

#(716) Differences in the Evaluation of Skin Prick Testing Results For Food Allergy Diagnosis Between US and UK Physicians.

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Methodology

Figure 1

Q1: Do you measure both wheal and flare when skin prick testing for food allergy?

- ACAAI *(n = 970) vs BSACI *(n = 251)

Respondents
- ACAAI: 778 (80 %)
- BSACI: 237 (94 %)

*ACAAC: American College of Allergy, Asthma, and Immunology
*BSACI: The British Society for Allergy and Clinical Immunology

Figure 2

Q2: If the wheal diameter is 0 mm, do you consider a large flare response as a positive result for skin prick testing?

- US: 2017, 2018
- UK: 2017

Respondents
- ACAAI: 478 (49 %)
- BSACI: 159 (45 %)

Figure 3

Q3: What cut-off do you use for a positive flare response?

- US: 2017, 2018
- UK: 2017

Respondents
- ACAAI: 478 (49 %)
- BSACI: 159 (45 %)

Table I. Survey Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Respondents Number</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1: Do you measure both wheal and flare when skin prick testing for food allergy?</td>
<td>US</td>
<td>UK</td>
</tr>
<tr>
<td>A) Yes, I measure both.</td>
<td>391 (82.9)</td>
<td>23 (14.5)</td>
</tr>
<tr>
<td>B) No, I measure the flare.</td>
<td>82 (17.0)</td>
<td>136 (85.5)</td>
</tr>
<tr>
<td>C) No, I only measure the flare.</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

Q2: If the wheal diameter is 0 mm, do you consider a large flare response as a positive result for skin prick testing?

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Yes, I consider a large flare response (in the absence of a wheal) as a positive skin testing result.</td>
<td>146 (30.7)</td>
<td>32 (20.9)</td>
</tr>
<tr>
<td>B) No, if the wheal is absent, I will ignore the flare.</td>
<td>330 (69.3)</td>
<td>125 (79.1)</td>
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</table>

Q3: What cut-off do you use for a positive flare response?

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>UK</th>
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<tbody>
<tr>
<td>A) None, I ignore don’t measure the flare.</td>
<td>393 (82.4)</td>
<td>134 (84.3)</td>
</tr>
<tr>
<td>B) I consider a &gt;5 mm flare response positive.</td>
<td>58 (12.2)</td>
<td>14 (8.9)</td>
</tr>
<tr>
<td>C) I consider a &gt;10 mm flare response positive.</td>
<td>26 (5.5)</td>
<td>11 (6.9)</td>
</tr>
</tbody>
</table>

Statistical significance was determined at the * p<0.025, ** p <0.01, *** p<0.001, and **** p<0.0001 levels.

Figure 4

Q4: Has your practice with regards to measuring considering the flare response changed over the years?

1) Eighty-two percent of US allergists surveyed measure both the wheal and the flare compared to 14% of UK physicians.
2) Many more UK allergists ignore the flare in the absence of the wheal.
3) Fifty-eight percent of US physicians will consider a positive flare response and only 24% will consider a >10 mm flare response as positive in the absence of the wheal.
4) The providers’ practice with regards to measuring and considering the flare did not change over time in either region based on self-report.

Conclusions

1) Identified significant discrepancies in SPT interpretation practices between allergists in the US and the UK.
2) These differences may potentially contribute to conflicting diagnoses for patients, alter management plans, and ultimately affect the clinical outcomes of IgE-mediated food allergy patients.

Future Considerations

1) Follow-up survey to evaluate whether SPT interpretation affected a practitioner’s decision to proceed with oral food provocation challenges.
2) Inquire whether the practice of using wheal +/- flare was applied across all age groups tested for food allergies.
3) Potential for academic versus private practice bias.

References

Abstract/References available at the following link:  

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