House Dust Mite Sublingual Immunotherapy for the Treatment of Allergic Rhinitis and Asthma in Pediatric Patients

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Disclosure

- I have no financial relationship with pharmaceutical companies, biomedical device manufacturers or distributors, or others whose projects or services may be considered related to the subject matter of my presentation.

Abbreviations

- HDMs: House dust mites
- AR: Allergic rhinitis
- ARIA: Allergic Rhinitis and its Impact on Asthma
- WHO: World Health Organization
- IAR: Intermittent allergic rhinitis
- PER: Persistent allergic rhinitis
- LTRA: Leukotriene receptor antagonist
- CS: Corticosteroid
- LABA: Long acting beta-agonist
- SABA: Short acting beta-agonist
- ICS: Inhaled corticosteroid
- SCIT: Subcutaneous immunotherapy
- SLIT: Sublingual immunotherapy
- SC: Subcutaneous
- SL: Sublingual
- D.pt: Dermatophagoides pteronyssinus

Learning Objectives

- Recognize the prevalence of house dust mite allergens and their association with allergic rhinitis and asthma
- Describe the epidemiology and economic burden of allergic rhinitis and asthma
- Explain the pathophysiology of IgE-mediated hypersensitivity reactions
- Identify current non-pharmacological and pharmacological strategies for the treatment of allergic rhinitis
- Discuss the role of sublingual house dust mite immunotherapy in the management of allergic rhinitis and asthma

Question 1

Which of the following is the most prevalent indoor allergen?

- Animal dander
- Mold
- House dust mite
- Cockroach

Question 1

Which of the following is the most prevalent indoor allergen?

- Animal dander
- Mold
- House dust mite
- Cockroach
House Dust Mites

- Most prevalent of all indoor allergens
- 84% of US homes have detectable dust mite allergen
- Most commonly detected aeroallergen during skin testing

Family
- Pyrollyphidae

Phylum
- Arthropods

Subclass
- Acari

Class
- Arachnid

Most common species:
- Dermatophagoides pteronyssinus
- Dermatophagoides farinae
- Eroglyphus maynei

IgE-mediated sensitivity to HDMs is associated with:
- Allergic rhinitis
- Asthma
- Atopic dermatitis

Epidemiology of Allergic Rhinitis

- 500 million adult and pediatric patients worldwide

- Incidence
  - 1.5-39.7%
  - Steadily increasing rates

- United States
  - Pediatrics: most common chronic disease
  - Overall: 5th most common chronic disease

Epidemiology of Asthma

- 300 million adult and pediatric patients worldwide

- Common Comorbidity
  - 10-40% of patients with allergic rhinitis also have asthma diagnosis
  - 80% of asthmatic patients experience symptoms consistent with allergic rhinitis
Question 2

What is the estimated range for the annual direct medical cost associated with allergic rhinitis?

- 7-10 million dollars
- 2-5 billion dollars
- 6-8 billion dollars
- 3-6 million dollars

Economic Burden

Allergic rhinitis
- Annual direct cost: $3.4 billion
- 50% attributable to prescription medications

Asthma
- Annual direct cost per person: $3,259
- 2007 annual direct/indirect cost: $56 billion

Question 3

Which of the following result from IgE-mediated hypersensitivity reactions?

- Late phase reactions
- Inflammation
- Early phase reactions
- All of the above

Pathophysiology

IgE-mediated hypersensitivity reaction
- Allergen-induced sensitization
  - Inflammation
  - Early phase reactions
  - Late phase reactions
Sensitization Phase

APC  MHC II  HDM

CD4+ T cell  T-helper Type 2


Early Phase Reactions

Mast cell

Histamine

30 min


Late Phase Reactions

Mediators

Chemotaxis
Recruitment
Reactivation

4-8 hours


Pathophysiologic Link Between Allergic Rhinitis and Asthma

IgE-mediated inflammation

“One Airway, One Disease”

Upper Airway
Lower Airway

Allergen exposure
Bronchial hyperresponsiveness

Link Between Rhinitis and Asthma Severity

Upper airway disease severity

Rhinitis

Asthma

Lower airway disease severity

Overall Syndrome Severity


Current Practice

Initial Management

Non-Pharmacologic

Pharmacologic

Environmental Controls

Impermeable bed cover

Hard floor

Acaricides

Wash on hot cycle

HEPA filter

Minimize dust

Environmental controls have been shown to reduce overall allergen levels and alleviate symptoms.

• True
• False

### Effectiveness of Avoidance Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Evidence of effect on allergen levels</th>
<th>Evidence of clinical benefit</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encase bedding in impermeable covers</td>
<td>Some</td>
<td>None (adults) Some (children)</td>
<td>A</td>
</tr>
<tr>
<td>Replace carpets with hard flooring</td>
<td>Some</td>
<td>None</td>
<td>A</td>
</tr>
<tr>
<td>Acaricides and/or tannic acid</td>
<td>Weak</td>
<td>None</td>
<td>A</td>
</tr>
<tr>
<td>Wash bedding on hot cycle</td>
<td>Some</td>
<td>None</td>
<td>A</td>
</tr>
<tr>
<td>Utilize HEPA filter air cleaners, and vacuum cleaners with HEPA filter</td>
<td>Weak</td>
<td>None</td>
<td>B</td>
</tr>
<tr>
<td>Minimize objects that accumulate dust</td>
<td>None</td>
<td>None</td>
<td>B</td>
</tr>
</tbody>
</table>


### ARIA

- **Allergic Rhinitis and its Impact on Asthma**
  - 1999 ARIA WHO workshop
  - 2008 ARIA Update
  - 2010 ARIA Update

**Allergic Rhinitis**

- Symptomatic disorder of the nose induced after allergen exposure by IgE-mediated inflammation

### ARIA Recommendations

**Diagnosis of allergic rhinitis**

Check for asthma especially in patients with severe and/or persistent rhinitis

**Initial Management**

- Non-Pharmacologic
- Pharmacologic

**Non-Pharmacologic**

**Pharmacologic**

**ARIA**

- Intermittent
  - Symptoms present < 4 days a week
  - OR for < 4 consecutive weeks

- Persistent
  - Symptoms present more than 4 days a week
  - AND for > 4 consecutive weeks

**Mild**

- None of the following symptoms are present: sleep disturbance, impairment of daily activities, leisure and/or sport, impairment of school or work
- Symptoms present but not troublesome

**Moderate/severe**

- One or more of the following items are present:
  - Sleep disturbance, impairment of daily activities, leisure and/or sport, impairment of school or work, troublesome symptoms

**ARIA Recommendations**

- **Mild**
  - Oral H1-blocker or intranasal H1-blocker and/or decongestant or LTRA (or cromone)

- **Moderate**
  - Consider specific immunotherapy

- **Mild**
  - Oral H1-blocker or intranasal H1-blocker and/or decongestant or intranasal CS or LTRA (or cromone)

In persistent rhinitis review the patient after 2-4 weeks

If failure step-up if failure, continue for 1 month

Allergen and irritant avoidance may be appropriate

ARIA Recommendations

Diagnosis of allergic rhinitis

Check for asthma especially in patients with severe and/or persistent rhinitis

Intermittent symptoms

Mild

Moderate/severe

Persistent symptoms

Mild

Moderate/severe

Moderate/severe

ARIA 2010 Update

Should SCIT be used in patients with allergic rhinitis and asthma?

• Suggest SCIT for treatment of asthma (Moderate evidence)

Should SLIT be used in patients with allergic rhinitis and asthma?

• Suggest SLIT for treatment of asthma (Low evidence)

ARIA Recommendations

Moderate-severe

In preferred order: Intranasal CS, H1-blocker or LTRA

Review the patient after 2-4 weeks

Failure

Step-down and continue treatment for > 1 month

Add or increase intranasal CS dose

Rhinitis Add ipratropium

Blockage add decongestant or oral CS (short term)

Improved

Step-down and continue treatment

ARIA Recommendations

Mild

*Oral H1-blocker or intranasal H1-blocker and/or decongestant or LTRA

In persistent rhinitis review the patient after 2-4 weeks

If failure step-up

If improved: continue for 1 month

Consider specific immunotherapy

EP3 Guidelines: Children 0-4 Years of Age

Intermittent or Persistent Asthma (Mild, Moderate, Severe)

Step 1

• SABA prn

Step 2

• Low-dose ICS

Step 3

• Medium-dose ICS

Step 6

• High-dose ICS + LABA or Montelukast + Ipratropium

Step 5

• High-dose ICS + LABA or Montelukast

Step 4

• Medium-dose ICS + LABA or Montelukast

EP3 Guidelines: Children 5-11 Years of Age

Intermittent or Persistent Asthma (Mild, Moderate, Severe)

Step 1
• SABA prn

Step 2
• Low-dose ICS
• Alternative: Cromolyn, LTRA, Nedocromil or Theophylline

Step 3
• Low-dose ICS + LABA, LTRA, or Theophylline
• Alternative: Medium-dose ICS

Step 4
• Medium-dose ICS + LABA
• Alternative: Medium-dose ICS + LTRA or Theophylline

Step 5
• High-dose ICS + LABA
• Alternative: High-dose ICS + LTRA or Theophylline

Step 6
• High-dose ICS + LABA + Oral corticosteroids
• Alternative: High-dose ICS + LTRA or Theophylline + Oral corticosteroids

Steps 2-6: Consider subcutaneous allergen immunotherapy for patients who have persistent allergic asthma

EP3 Guidelines: ≥12 Years of Age

Intermittent or Persistent Asthma (Mild, Moderate, Severe)

Step 1
• SABA prn

Step 2
• Low-dose ICS
• Alternative: Cromolyn, LTRA, Nedocromil or Theophylline

Step 3
• Low-dose ICS + LABA, LTRA, or Medium dose ICS
• Alternative: Low-dose ICS + either LTRA, Theophylline, or Zileuton

Step 4
• Medium-dose ICS + LABA
• Alternative: Medium-dose ICS + either LTRA, Theophylline, or Zileuton

Step 5
• High-dose ICS + LABA
• AND: Consider Omalizumab for patients who have allergies

Step 6
• High-dose ICS + LABA + Oral corticosteroids
• AND: Consider Omalizumab for patients who have allergies

Steps 2-6: Consider subcutaneous allergen immunotherapy for patients who have persistent allergic asthma

Management

- Non-Pharmacologic
- Pharmacologic
- Immunotherapy

Allergen-Specific Immunotherapy

- Only treatment proven to modify disease
- Must have proven diagnosis of IgE-mediated allergy
- Improves immune system tolerance to offending allergen
- Continued beneficial effects

Initiation phase
• Dose escalation for several months

Peak Effect
• Several weeks to one year after therapy is initiated

Maintenance phase
• Minimum of 3 years

SCIT

Efficacy
- Supported by systematic reviews of randomized controlled trials
- Well-established for both rhinitis and asthma
- Effective at reducing symptoms, need for medication, and IgE levels

Safety
- Local and systemic reactions
- Concern for anaphylaxis
- Rate of systemic reactions: 0.08-0.9%
- Deaths: 1 per 2.5 million injections

Dosing
- Weekly injections
- Administered in physician’s office
- Required to remain in office for a minimum of 30 minutes

FDA status
- FDA approved

Additional Comments
- Instructed to carry epinephrine autoinjector
- Costly, may not be covered by insurance

SLIT

Efficacy
- Supported by systematic reviews of randomized controlled trials
- Controversy exists, gained little acceptance in the USA

Safety
- Local effects: itching and swelling under tongue and on the lips
- Rate of systemic reactions: 0.056%
- No reported deaths

Dosing
- Sublingual drops or tablets
- Administered at home
- First dose should be administered in physician’s office

FDA status
- Aqueous: “off-label” use
- Tablets: 3 approved in April 2014 (Grastek®, Oralair®, Ragwitek®)
- Limited number of allergens available
- MK-8237 currently under FDA review

Additional Comments
- Single antigen therapy
- Providers may require epinephrine autoinjector
Pediatric Considerations


Study Design
- Randomized, double-blind, placebo-controlled trial

Comparison
- SL vs placebo

Diagnosis
- Patients allergic to D.pt with mild to moderate asthma, allergic rhinitis or both asthma and rhinitis

Regimen
- 3-week dose escalation phase followed by maintenance therapy

Treatment Duration
- 1 year

Patients

<table>
<thead>
<tr>
<th>Reference</th>
<th>Study Design</th>
<th>Number of patients</th>
<th>Age (year)</th>
<th>Duration (month)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pajno, 2000.</td>
<td>Double-blind, randomized, placebo-controlled trial</td>
<td>24</td>
<td>8-15</td>
<td>24</td>
<td>Use of medication was significantly lower.</td>
</tr>
</tbody>
</table>

Adverse Events

- Local swelling, reddening and tingling of tongue, buccal mucosa and/or gingiva
- SLIT = 5 patients
- Placebo = 1 patient

Conclusion
- No consistent clinical improvements in actively treated patients compared to placebo

Limitations

- Sample size, power not met
- Placebo-controlled
- Short treatment duration
- SL dosages may have been too low to be effective

Patients

<table>
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<tr>
<th>Reference</th>
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<th>Age (year)</th>
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<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ippoliti, 2003.</td>
<td>Double-blind, randomized, placebo-controlled trial</td>
<td>88</td>
<td>5-12</td>
<td>6</td>
<td>Significant improvement in mean symptom scores for asthma and rhinitis after 6 months</td>
</tr>
<tr>
<td>Marcucci, 2005.</td>
<td>Double-blind, randomized, placebo-controlled trial</td>
<td>36</td>
<td>4-15</td>
<td>24-36</td>
<td>Significant improvement in yearly scores for rhinitis, asthma, and drug usage in the 3rd year of treatment</td>
</tr>
</tbody>
</table>

Reference Study Design Number of patients Age Duration Results
Pajno, 2000. Double-blind, randomized, placebo-controlled trial 24 8-15 24 Use of medication was significantly lower. Significant improvement in the number of asthma episodes. Significant decrease in the number of nighttime episodes.
Bahceciler, 2001. Double-blind, randomized, placebo-controlled trial 15 7-15 6 No significant difference in use of medications. Fewer asthma exacerbations. Significant improvement in the mean daily asthma score during the last 4 months.

Studies 2000-2006

Reference Study Design Number of patients Age Duration Results
Ippoliti, 2003. Double-blind, randomized, placebo-controlled trial 88 5-12 6 Significant improvement in mean symptom scores for asthma and rhinitis after 6 months.

Reference Study Design Number of patients Age Duration Results
No. 2006. Multi-center, double-blind, randomized, placebo-controlled trial 97 5-12 12 Significant difference in daily, nighttime, and daytime asthma/tm symptom scores. No significant reduction in use of oral corticosteroids or antihistamines.
Loi, 2006. Double-blind, placebo-controlled trial 20 5-12 6 Significant difference in nighttime asthma symptom scores. No significant difference in daytime symptom scores. Mean daily use of medication decreased by the end of the trial.

Hirsch, et al. 1997. • Randomized, double-blind, placebo-controlled trial
Study Design • SL vs placebo
Comparison • Patients allergic to D.pt with mild to moderate asthma, allergic rhinitis or both asthma and rhinitis
Diagnosis • 3-week dose escalation phase followed by maintenance therapy
Regimen • 1 year
Treatment Duration

Patients Results Adverse Events Conclusion
30 children Age: 6-15 years SLIT • No significant difference in patient assessed health when compared with placebo. • Physician assessed health system a non-significant in the SL group, but had considerable placebo effect.

Limitations

- Sample size, power not met
- Placebo-controlled
- Short treatment duration
- SL doses may have been too low to be effective

Studies 2000-2006

Reference Study Design Number of patients Age Duration Results
Ippoliti, 2003. Double-blind, randomized, placebo-controlled trial 88 5-12 6 Significant improvement in mean symptom scores for asthma and rhinitis after 6 months.

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### Studies 2000-2006

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<tr>
<th>Reference</th>
<th>Adverse Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pajno, 2000.</td>
<td>Local delayed reactions: 2 in SLIT, self-resolved</td>
</tr>
<tr>
<td>Bahceciler, 2001.</td>
<td>No local or systemic side effects reported</td>
</tr>
<tr>
<td>Ippoliti, 2003.</td>
<td>Local or systemic side effects: no relevant findings</td>
</tr>
<tr>
<td>Marcucci, 2005.</td>
<td>No safety data reported</td>
</tr>
<tr>
<td>Niu, 2006.</td>
<td>No incidence of serious drug-related adverse events reported</td>
</tr>
<tr>
<td>Lue, 2006.</td>
<td>Any adverse event: 6 in SLIT group, 7 in placebo group</td>
</tr>
</tbody>
</table>

**Pham-Thi, et al. 2007.**

| Study Design | • Randomized, double-blind, placebo-controlled trial |
| Comparison | • SL vs placebo |
| Diagnosis | • Asthma with or without perennial rhinitis sensitized to HDM |
| Regimen | • 2-week dose escalation phase followed by maintenance therapy |
| Treatment Duration | • 18 months |

**Patients**

<table>
<thead>
<tr>
<th>Results</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLIT</td>
<td>Experienced at least one adverse event</td>
</tr>
<tr>
<td>SLIT</td>
<td>SLIT = 39 (71%) patients</td>
</tr>
<tr>
<td>Placebo</td>
<td>Placebo = 37 (66%) patients</td>
</tr>
<tr>
<td>SLIT is well tolerated and safe but cannot provide significant additional immediate benefits when patients are well managed on optimal drug therapy</td>
<td></td>
</tr>
</tbody>
</table>

**Eifan, et al. 2010.**

| Study Design | • Single-center, prospective, randomized, controlled, open labeled, three parallel group trial |
| Comparison | • SL and SC vs pharmacotherapy |
| Diagnosis | • Mild persistent asthma/rhinitis monosensitized to HDM |
| Regimen | • 1-month (SL) or 16-week (SQ) dose escalation followed by maintenance phase |
| Treatment Duration | • 1 year |

**Patients**

<table>
<thead>
<tr>
<th>Age</th>
<th>Results</th>
<th>Adverse Events</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10 years</td>
<td>SLIT</td>
<td>Significant reduction in daily symptoms and concomitant medication scores</td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>SCIT</td>
<td>Significant reduction in daily symptoms and concomitant medication scores</td>
<td></td>
</tr>
<tr>
<td>16 weeks</td>
<td>SLIT vs SCIT</td>
<td>No statistical differences observed</td>
<td></td>
</tr>
<tr>
<td>Pharmacotherapy</td>
<td>Both SCIT and SLIT effectively reduced daily symptoms and medication consumption</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Keles, et al. 2011.**

| Study Design | • Prospective, randomized, controlled trial |
| Comparison | • SC and SL vs pharmacotherapy |
| Diagnosis | • Mild persistent/moderate asthma/rhinitis monosensitized to HDM |
| Regimen | • 1-month (SL) or 16-week (SO) dose escalation followed by maintenance phase |
| Treatment Duration | • 18 months |

**Patients**

<table>
<thead>
<tr>
<th>Age</th>
<th>Results</th>
<th>Adverse Events</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10 years</td>
<td>SLIT</td>
<td>System reactions</td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>SCIT = 2 patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 weeks</td>
<td>Local injection site reactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>SCIT = 1 patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacotherapy alone</td>
<td>Both SCIT and SLIT effectively reduced daily symptoms and medication consumption</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Limitations**

- Sample size, power not met
- Lack of blinding

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<table>
<thead>
<tr>
<th>Patients</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 children</td>
<td>SLIT</td>
</tr>
<tr>
<td>SC (n=11)</td>
<td>Reduction in ICS dosage and number of asthma attacks detected at 12 months</td>
</tr>
<tr>
<td>SL (n=13)</td>
<td>Significant improvement in VAS score for asthma only</td>
</tr>
<tr>
<td>SC + SL 9 (n=14)</td>
<td>SCIT</td>
</tr>
<tr>
<td>Pharmacotherapy alone (n=12)</td>
<td>Similar decrease in symptom and medication scores when compared with SC + SL</td>
</tr>
<tr>
<td>Age: 5-12 years</td>
<td>Significant improvement in VAS score for asthma only</td>
</tr>
<tr>
<td></td>
<td>Reduction in ICS dosage and number of asthma attacks detected at 4,12, and 18 months</td>
</tr>
<tr>
<td></td>
<td>Significant improvement in VAS score for asthma and rhinitis</td>
</tr>
</tbody>
</table>

Adverse Events                 Conclusion                                             Limitations                      
Dyspnea and wheezing           • Both SCIT and SLIT were more effective than pharmacotherapy |
                                 • Combination of SCIT with SLIT was more effective than SLIT and safer than SCIT |
                                 • Small sample size |
                                 • No mention of power |
                                 • Lack of blinding


<table>
<thead>
<tr>
<th>Study Design</th>
<th>• Randomized, double-blind, placebo-controlled, double-dummy trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
<td>• SC and SL versus baseline, SC and SL versus placebo, SL vs SQ</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>• Persistent rhinitis and asthma monosensitized to HDM</td>
</tr>
<tr>
<td>Regimen</td>
<td>• 12-week dose escalation/induction phase followed by maintenance therapy</td>
</tr>
<tr>
<td>Treatment Duration</td>
<td>• 1 year</td>
</tr>
</tbody>
</table>

Patients                        | Results                                                                 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30 children</td>
<td>SLIT</td>
</tr>
<tr>
<td>SC (n=10)</td>
<td>Significant reduction in symptom scores associated with rhinitis and asthma and in medication scores associated with rhinitis when compared to baseline</td>
</tr>
<tr>
<td>SL (n=10)</td>
<td>Significant reduction in symptom scores and medication scores associated with rhinitis and asthma when compared with placebo</td>
</tr>
<tr>
<td>Placebo (n=10)</td>
<td>Significant reduction in symptom scores and medication scores associated with rhinitis and asthma when compared to baseline and placebo</td>
</tr>
<tr>
<td></td>
<td>SLIT vs SCIT</td>
</tr>
<tr>
<td></td>
<td>• No significant reduction in symptom or medication scores associated with rhinitis when compared</td>
</tr>
<tr>
<td></td>
<td>• Significant reduction in asthma symptoms with SCIT when compared</td>
</tr>
</tbody>
</table>

Adverse Events                 Conclusion                                             Limitations                      
Systemic side effects           • No mention of power |
• None                           • Short treatment duration |
• Local injection site reactions • SL dose may have been too low to be effective |
• SCIT = 2 patients              • Only SCIT demonstrated a superior effect to placebo on the reduction of symptoms and medication use |
• Placebo = 2 patients           • Both SCIT and SLIT effectively reduced symptoms and medication use compared to baseline year |
• Itching or mild edema in mouth and/or throat |
• SLIT = 3 patients              • No mention of power |
• Placebo = 2 patients           • Only SCIT demonstrated a superior effect to placebo on the reduction of symptoms and medication use |

Meta Analysis

Design                     Objective                                      Results                                      Conclusion                                    
• Meta-analysis of 11 studies including a total of 654 children with asthma/rhinitis who were sensitized to HDM |
• Further evaluate the efficacy and safety of dust mite SLIT in children with asthma |
• Significantly decreased asthma symptom score (P = 0.007) |
• No difference in medication score (P=0.406) |
• Safety was similar between groups |
• Findings are not enough to support the use of dust mite SLIT in children with asthma
Question 5

Which of the following statements are true regarding the use of SLIT in pediatric asthma patients sensitized to HDM? Select all that apply.

- SLIT appears to be safe
- SLIT is effective at low doses
- Efficacy appears soon after SLIT initiation
- Combination of SC induction and SL maintenance does not improve asthma symptoms

What We Know

Appears to be relatively effective and safe

Requires significantly higher doses than SCIT to show effect

SLIT

Appearance of clinical efficacy needs much more time than SCIT

Combination of SC induction and SL maintenance significantly improved rhinitis and asthma symptoms

Future Directions

- Larger well designed trials
- Long term data
- FDA approval
- Larger well designed trials

Limitations

- Heterogeneity – clinically and methodologically
- Small sample sizes
- Short treatment durations
- Single antigen therapy for monosensitized patients

Acknowledgement

- Janice Stumpf, PharmD
Post Test Assessment

Post Test Question 1
What percentage of pediatric and adolescent patients with asthma are sensitized to HDMs?

• 25%
• 75%
• 100%
• 50%

Post Test Question 2
In the United States, what is the most common chronic disease in the pediatric population?

• Attention-Deficit Disorder
• Allergic rhinitis
• Obesity
• Cancer

Post Test Question 3
The prevalence of IgE sensitization to HDMs is positively correlated with both the frequency of asthma and its severity.

• True
• False

Post Test Question 4
Based on ARIA recommendations, which of the following is the preferred first line treatment for moderate-severe persistent allergic rhinitis?

• Intranasal corticosteroid
• Leukotriene receptor antagonist
• Oral corticosteroid
• Oral H₁-blocker

Post Test Question 5
Which of the following is NOT a limitation of the current HDM pediatric asthma trials?

• Short treatment durations
• Clinical and methodological heterogeneity
• Number of adverse events
• Small sample size
House Dust Mite Sublingual Immunotherapy for the Treatment of Allergic Rhinitis and Asthma in Pediatric Patients

Jessika Richards, PharmD
PGY-2 Pediatric Resident
University of Michigan Health System
January 13, 2017