Neonatal Infant Interventions to prevent Asthma and Allergic diseases

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Focus on...

1. Inhaled allergens

2. Respiratory viruses
Terminology

- Asthma = syndrome

- Allergy = feature
Allergic or not?

Asthmatic or not?

Before any intervention

The challenge is to identify the newborn at risk!
Allergic diseases ...

ALLERGY

- healthy
- enteritis
- rhinitis
- migraine
- eczema
- asthma
- urticaria
- conjunctivitis
Allergy – the pitfalls.

1. Symptoms occur during life, under the influence of the environment

2. Can be present in healthy persons

3. Symptoms of allergy can be present without the presence of allergy (= positive SPT)

4. Allergy is dynamic, unpredictable, and certainly not a constant disease.
Maternal positive skin prick test results and asthma prediction after early childhood wheezing.


... neither the mother's nor the father's self-reported allergy or asthma was predictive of later development of asthma.

**SPT in parents**: the presence of parental, and especially maternal, positive skin prick test results is a significant predictive factor for the subsequent development of asthma in early childhood wheezing.
What is asthma?
Asthma = SYNDROME

1. Viral-induced asthma (young children)

2. Allergic asthma (older children)

3. Other types of asthma
   - EIA
   - Secondary asthma
   → (sinusitis, GER, ID)
Are anti-virals the answer to acute exacerbations of asthma?

- Role of rhinoviruses in acute asthma
- Deficiency in interferon (I & III) production
- Deficiency in IL-12, IL-15, IL-18 production
- Phase I studies of inhaled IFN-beta (adults)
... there are few truly justified recommendations for the prevention of asthma ...

... apart of avoidance of passive and active smoking...
GINA guidelines 2006
“Prevention of Asthma” (chapter 4)

... few measures can be recommended for prevention of asthma because the development of the disease is complex and incompletely understood...

Prevention of allergy
Prevention of asthma = prevention of allergy to inhaled allergens (HDM, pets, ...)

1. Pets

2. HDM
Pets and primary prevention of allergy

→ protective?
Sensitisation, asthma, and a modified Th2 response in children exposed to cat allergen: a population-based cross-sectional study

Non-linear allergic response to cat allergen

Thomas Platts-Mills, John Vaughan, Susan Squillace, Judith Woodfolk, Richard Sporik

Lancet 2001
Original article

Meta-analysis of determinants for pet ownership in 12 European birth cohorts on asthma and allergies: a GA²LEN initiative

Eller, et al.

-12 European birth cohort studies
- n = 25,056 families
-Aim: to describe determinants of cat and dog ownership
Original article

Meta-analysis of determinants for pet ownership in 12 European birth cohorts on asthma and allergies: a GA²LEN initiative

Conclusions: The chances to own a cat or dog were significantly reduced in allergic families, in parents with a higher educational level, and in homes without convenient ground access. In addition to parental allergies, social and housing factors should be considered as potential confounders in studies on pet exposure and allergic diseases.
• **Cat ownership: results are inconsistent**
  (some studies suggesting an increase in risk and others a decrease among cat owners).

• **Dog ownership: results are more consistent**
  (suggesting that owning a dog has no effect or indeed may be protective against the development of specific sensitization to dog and allergic sensitization in general).
House dust mites
Primary prevention of house dust mite allergy

Conclusion: **Contradictory results**

Reduction of exposure to indoor allergens (house dust mites) might even increase the risk for allergy and should not be recommended.

Early life environmental control: effect on symptoms, sensitization, and lung function at age 3 years.

...stringent environmental control in newborns was associated with an increased risk of mite sensitization at the age of 3 years.

### TABLE 3. ATOPIC SENSITIZATION ASSESSED BY SKIN PRICK TESTING AND SPECIFIC SERUM IGE

<table>
<thead>
<tr>
<th></th>
<th>Active (n = 125)</th>
<th>Control (n = 100)</th>
<th>Relative Risk and p Value (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Skin prick tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>D. pteronyssinus</em></td>
<td>25</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Fel d 1</td>
<td>13</td>
<td>10.4</td>
<td>7</td>
</tr>
<tr>
<td>Can f 1</td>
<td>14</td>
<td>11.2</td>
<td>6</td>
</tr>
<tr>
<td>Mixed grasses</td>
<td>20</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Milk</td>
<td>1</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>Egg</td>
<td>12/121</td>
<td>9.9</td>
<td>4/93</td>
</tr>
<tr>
<td><strong>Sensitized</strong></td>
<td>42/121</td>
<td>34.7</td>
<td>20/93</td>
</tr>
<tr>
<td><strong>IgE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>D. pteronyssinus</em></td>
<td>17</td>
<td>23.3</td>
<td>4</td>
</tr>
<tr>
<td>Fel d 1</td>
<td>9</td>
<td>12.3</td>
<td>6</td>
</tr>
<tr>
<td>Can f 1</td>
<td>7</td>
<td>9.6</td>
<td>5</td>
</tr>
<tr>
<td>Milk</td>
<td>8/70</td>
<td>11.4</td>
<td>2</td>
</tr>
<tr>
<td>Egg</td>
<td>8/71</td>
<td>11.3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Sensitized</strong></td>
<td>26</td>
<td>35.6</td>
<td>13</td>
</tr>
</tbody>
</table>

*Definition of abbreviation: NA = not applicable.*
How to measure contact with HDM?

HDM → Immune System

A mattress
A carpet
A pillow
Immunotherapy
Allergen exposure

mom cleaned

new mattress

mom lazy

→ ALLERGY
Better: high exposure + SIT?
Better?