Dust Mites are Indoor Allergens

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Aeroallergen sensitization and allergic disease phenotypes in Asia

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Figure 1. House dust mite sensitization rates in atopic individuals in Asia
HDM = everywhere?
Can we totally avoid contact with HDMs?

No!

… and yes!

… or no

… or yes!

Big Business!

“Miracle interventions against HDMs”
How to stop the HDM invasion?
asthma
rhinitis
eczema
urticaria
anaphylaxis
GUSTO Cohort - Positive SPT at age 18 months

- Milk: 0.8%
- Egg: 3.4%
- Peanut: 1.3%
- Der P: 8.2%
- Der F: 6.7%
- Blo T: 0.9%

n = 850

early sensitization!
GUSTO: Positive SPT at 18 and 36 months

n = 848

- Any food
- Milk
- Egg
- Peanut
- Any HDM
- Der p
- Der f
- Blom t

%
Relationship of house-dust mite allergen exposure in children's bedrooms in infancy to bronchial hyperresponsiveness and asthma diagnosis by age 6 to 7.


- HDM sensitization and asthma were related.

- Unable to find any relationship between level of HDM exposure in children's bedrooms (infancy) and asthma at age 6 to 7 years.
Relation between Der p2 and Der f2 antigen levels in house dust and the degree of sensitization in asthmatic patients.


- The lowest level needed to sensitize was 0.2 micrograms of antigen per gram of house dust *(what is house dust?)*

- a higher level of the house dust mite antigen was associated to more sensitization *(what about symptoms?)*

... confusing!
Problem: what is allergen exposure?

- amount reaching the patient’s immune system
- not the amount in a mattress or a carpet

→ unmeasurable
HDM-exposure

1. Concentrations of HDM (carpet, mattress...)

**CONFOUNDERS:**

2. Life style (cleaning habits, outdoor-persons)

3. Breathing style (mouth vs nose – frequency - ...)

4. Skin barrier function (defects)
House dust mite avoidance

- Wash bed linens in hot water weekly
- Bed and pillow covers
- Vacuum room and mattresses with HEPA vacuum
- Remove heavy curtains, carpets and stuffed toys

EFFECT?
Consequences of allergen avoidance...

1. In primary prevention
   results in exposure to a low dose of allergen = IgE response $\rightarrow$ **allergic sensitization**

2. In secondary – tertiary prevention *(after sensitization)*
   results in less symptoms
   (cfr. dose –response curve)
Woodcock A, Lowe LA, Murray CS, Simpson BM, Pipis SD, Kissen P, Simpson A, Custovic A; NAC Manchester Asthma and Allergy Study Group.

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

Conclusion

... stringent environmental control in newborns was associated with an increased risk of mite sensitization at the age of 3 years.
Impossible to avoid?
House dust mite control measures for asthma.

GØTZSCHE PC, JOHANSEN HK
Cochrane Database Syst Rev. 2008 April 16 (2): CD001187

- 54 trials (3002 patients)
  - 36 studies on physical methods (26 mattress encasings)
  - 10 chemical methods
  - 8 a combination of chemical and physical methods

CONCLUSION: “... cannot be recommended.”

COMMENT: It is doubtful whether further studies are worthwhile. If other types of studies are considered, they should be methodologically rigorous and use other methods than those used so far, with careful monitoring of mite exposure and relevant clinical outcomes.
House dust mite control measures

- Reduction of HDM concentration achieved
  - No or little clinical effect
  - A few positive studies in children showed mild improvement

- Atopic dermatitis
- HDM sensitization
- AR - AA
Real life - allergen exposure

mom cleaned

maid / mom: lazy

new mattress

maid LP

AL\text{LERGY}
Immunotherapy

SIT
SLIT

TOLERANCE
Primary prevention in young children. *Is high exposure (+ IT) better?*

![Graph showing natural exposure and SIT with TOLERANCE]

- Natural exposure
- SIT

$\text{Al}$

$\text{TOLERANCE}$
Better?
Dear students...

What is the best way to avoid contact with HDM?
Live outdoors!

Thank you!