

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?

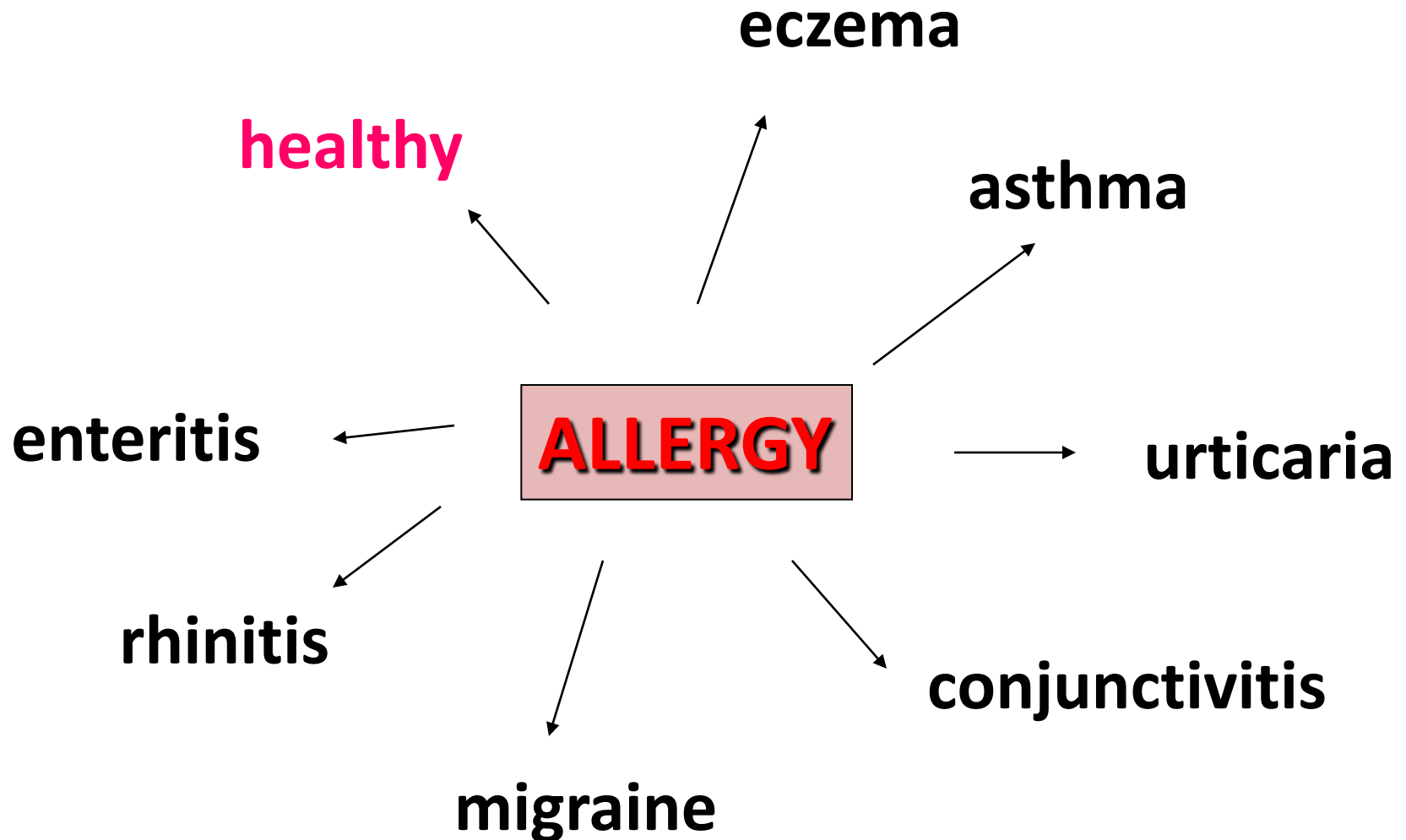
Asthmatic or not?



Before any intervention →

The challenge is to identify the newborn at risk!

Allergic diseases ...



Allergy – 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.*

Family history → false positive & negative

Maternal positive skin prick test results and asthma prediction after early childhood wheezing.

Elizur et al. Ann Allergy Asthma Immunol 2007, 98, 540-5.

... 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)

The Asthma Epidemic

Eder W, Ege MJ, von Mutius E.

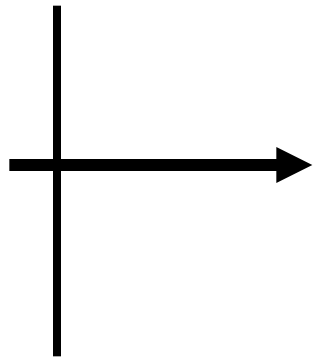
NEJM 2006, 355, 2226 – 35.

... 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)

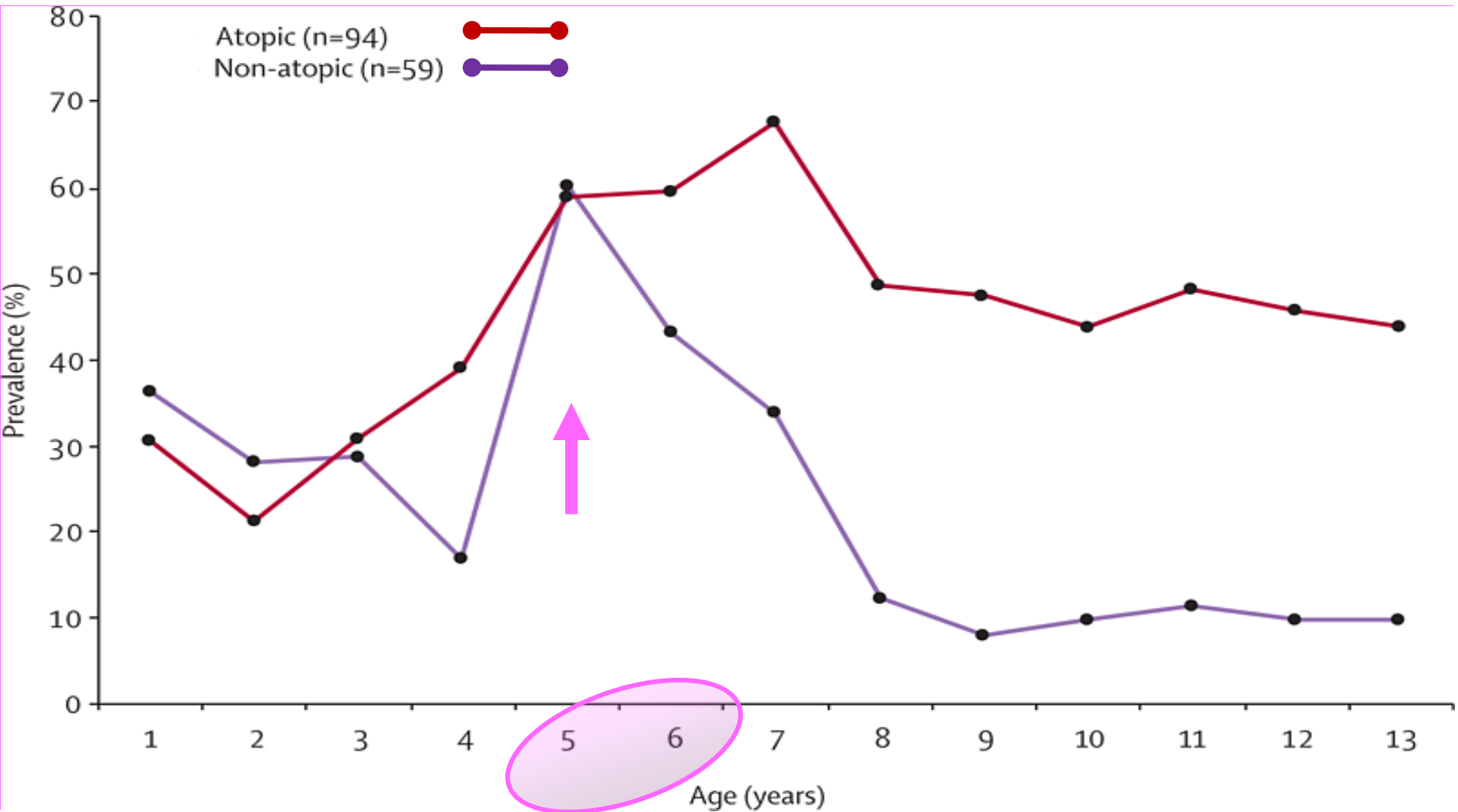


... few measures can be recommended for prevention of asthma because the development of the disease is complex and incompletely understood...



Prevention of allergy

Perennial allergen sensitisation early in life and chronic asthma in children: a birth cohort study. Illi S et al. Lancet 2006, 368, 763-770.



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

1. Pets

2. HDM

Pets and primary prevention of allergy



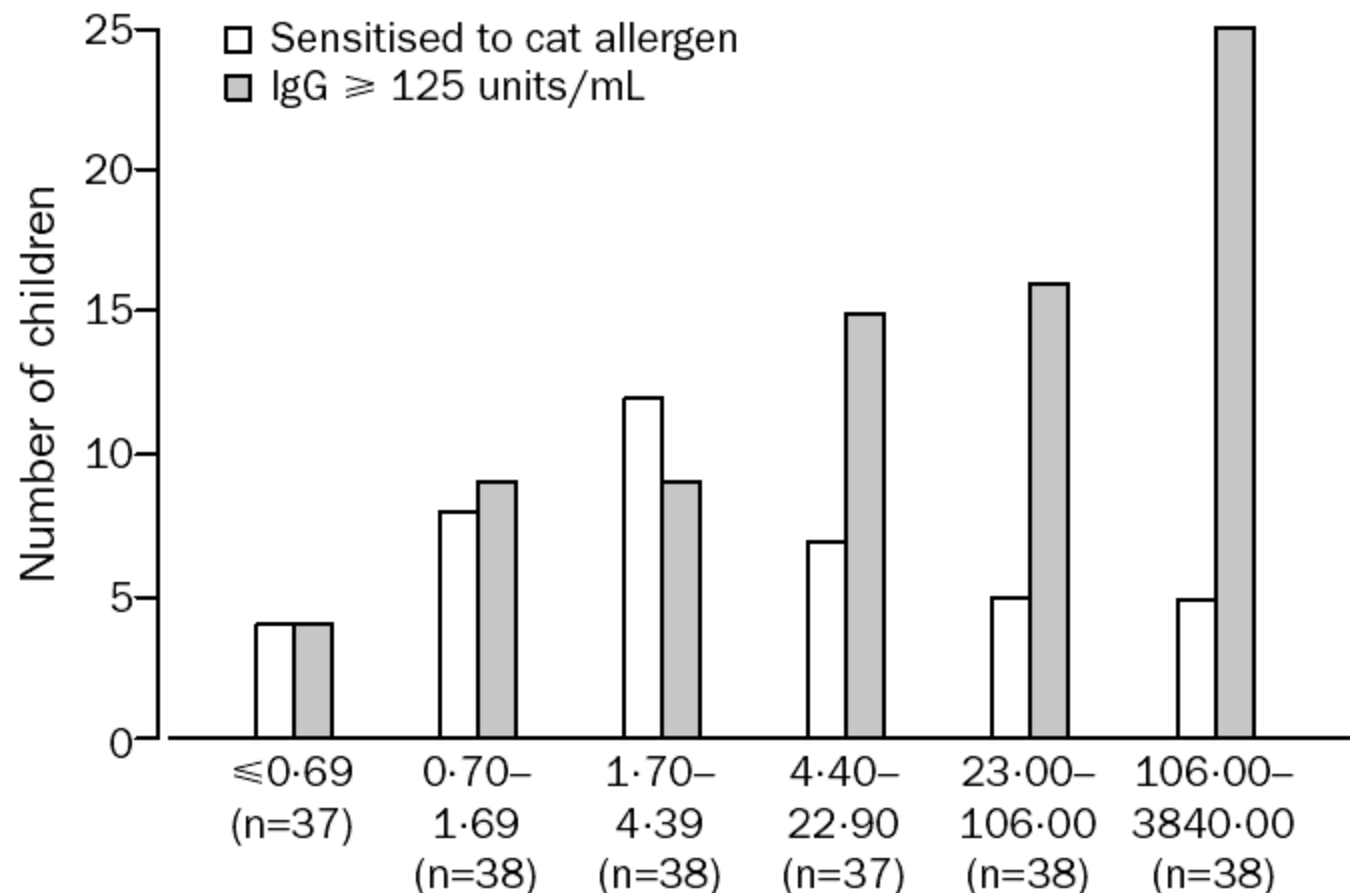
→ protective?

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

Eller, et al.

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.

Pets and the development of allergic sensitization. Simpson A, Custovic A. Curr Allergy Asthma Rep. 2005, 5, 212 – 220.

- **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.

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

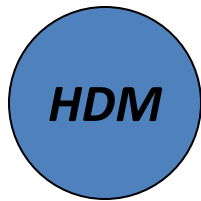
Woodcock A, et al. Early life environmental control: effect on symptoms, sensitization, and lung function at age 3 years.
Am J Respir Crit Care Med 2004, 170, 433 – 9.

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

	Active (n = 125)		Control (n = 100)		Relative Risk and p Value (95% confidence interval)
	n	%	n	%	
Skin prick tests					
<i>D. pteronyssinus</i>	25	20	12	12	1.67 (0.88–3.15), p = 0.15
Fel d 1	13	10.4	7	7	1.49 (0.62–3.58), p = 0.48
Can f 1	14	11.2	6	6	1.87 (0.74–4.68), p = 0.24
Mixed grasses	20	16	12	12	1.33 (0.69–2.59), p = 0.45
Milk	1	0.8	0	0	NA
Egg	12/121	9.9	4/93	4.3	2.31 (0.77–6.92), p = 0.19
Sensitized	42/121	34.7	20/93	21.5	1.61 (1.02–2.55), p = 0.04
IgE					
	Active, n = 73		Control, n = 49		
<i>D. pteronyssinus</i>	17	23.3	4	8.2	2.85 (1.02–7.97), p = 0.05
Fel d 1	9	12.3	6	12.2	1.01 (0.38–2.65), p = 1.0
Can f 1	7	9.6	5	10.2	0.94 (0.32–2.79), p = 1.0
Milk	8/70	11.4	2	4.1	2.72 (0.60–12.3), p = 0.19
Egg	8/71	11.3	4	8.2	1.35 (0.43–4.24), p = 0.76
Sensitized	26	35.6	13	26.5	1.34 (0.77–2.35), p = 0.33

Definition of abbreviation: NA = not applicable.

How to measure contact with HDM?



Immune System

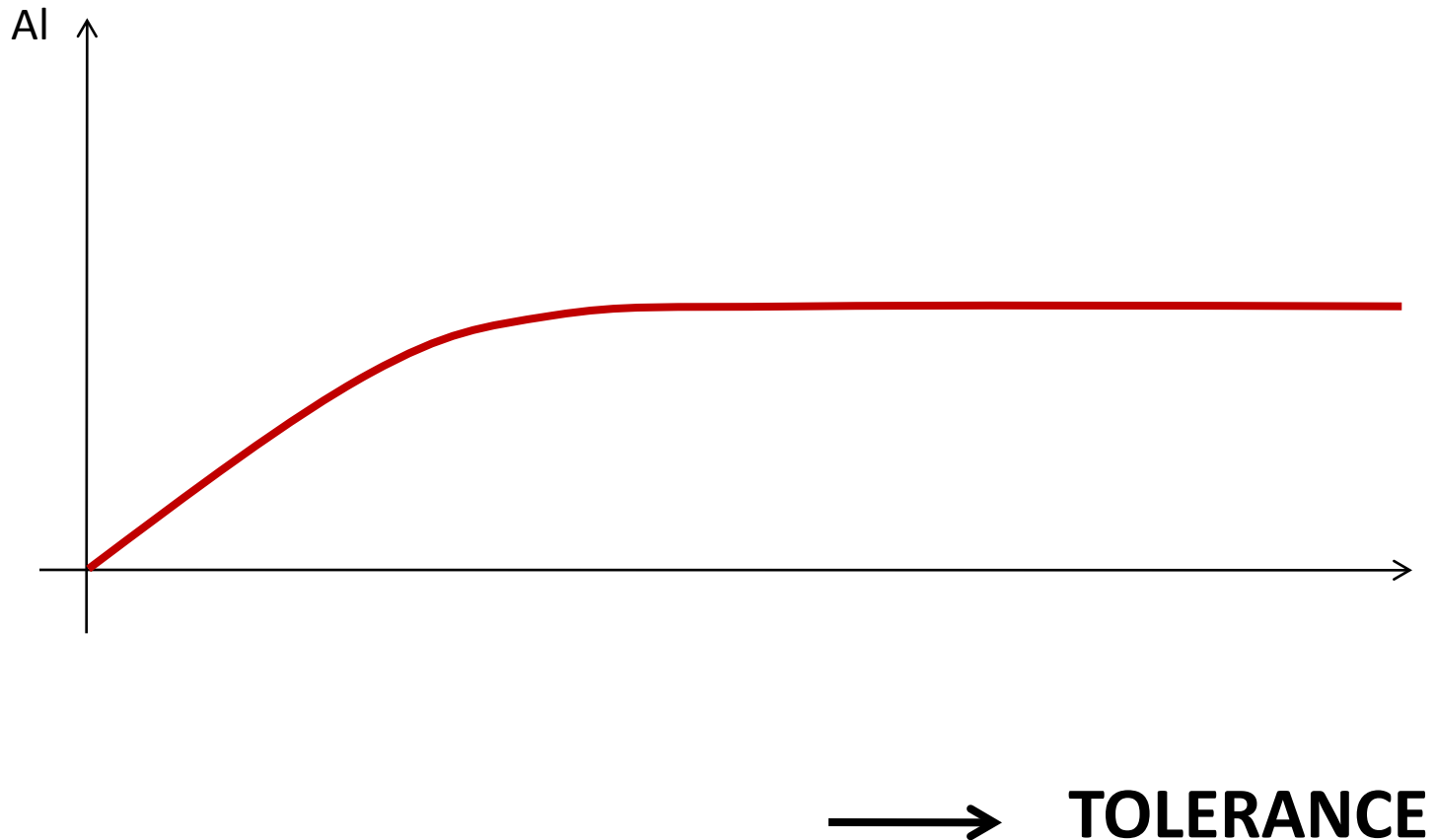


A mattress
A carpet
A pillow

?

Immunotherapy

SIT
SLIT

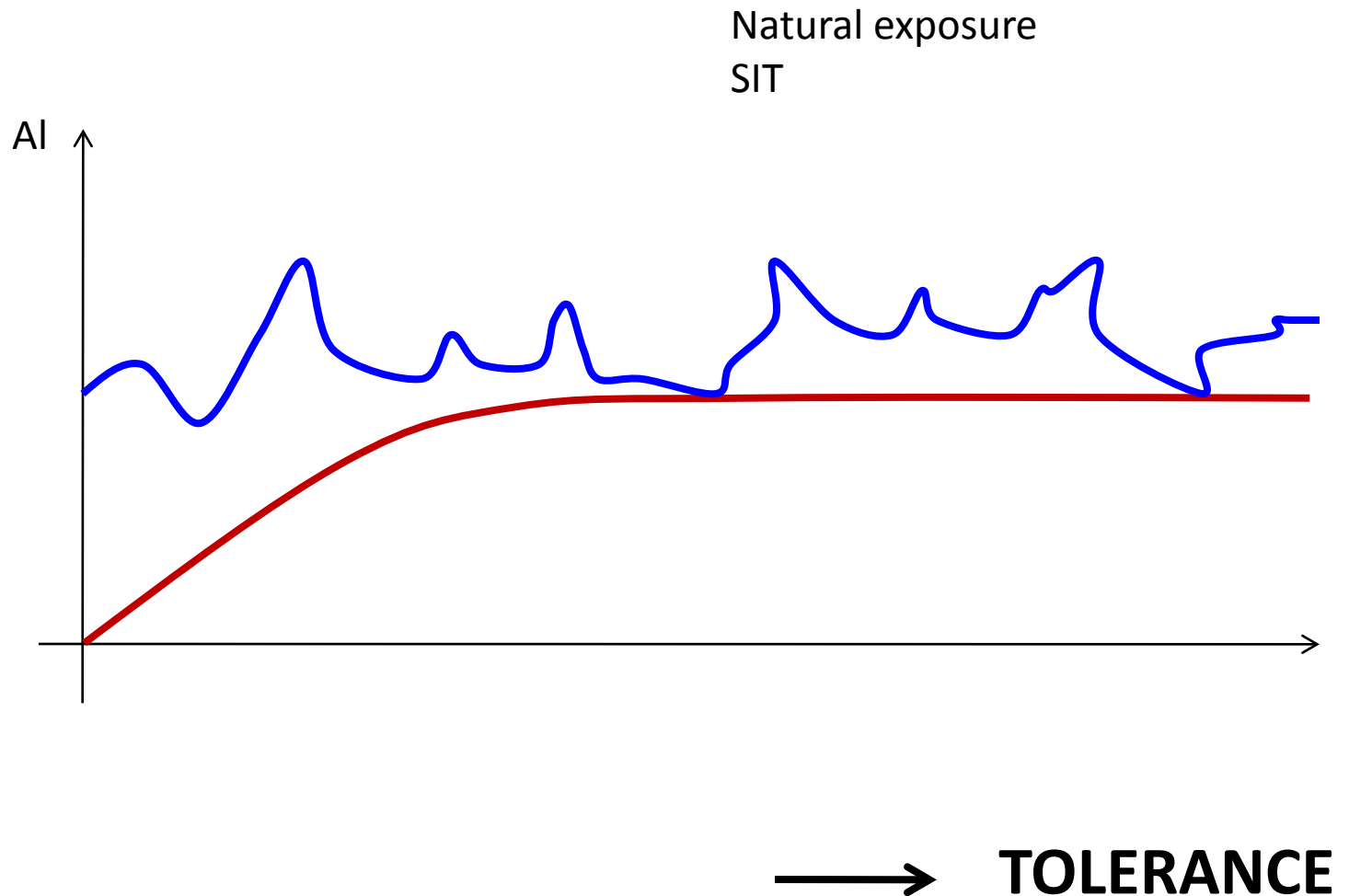


Allergen exposure



→ **ALLERGY**

Better: high exposure + SIT?



Better?

