

Summary of

Children's Health Asthma and Allergy

Carl-Gustaf Bornehag
Jan Sundell

Issues

- Dampness and Microbiological exposures
- Chemical/Particle exposures
- Methodological issues

Dampness exposure

Author	Country	Design	Settings	n	Finding
Reponen et al.	USA	Cross Sectional	Homes	483	Observed visible mould was assoc. to atopic wheeze while (1-3)-β-D-glucan in floor dust was negatively assoc. to atopic wheeze.
Hsu et al.	Taiwan	Cross Sectional	Homes	97	A dose-response relationship between the severity of visible mold at home and total serum IgE levels
Hsu et al.	Taiwan	Cross Sectional	Homes	14862	The severity of mold (cm) was associated to wheezing and asthma
Gustavsson et al.	Sweden	Cross Sectional	Day Care Centers	2334	Home env. self reported visible mould or dampness , as well as repainting and changing of flooring materials were assoc. to asthmatic and allergic problems.
Enayat et al.	Austria	Cross Sectional	Homes	125	Building/home characteristics such as position of the bed (at the outside wall h), type of building, kind of windows, buildings and building materials particular concrete walls and the heating system were associated with asthma. There was a significant relationship between the visible mold growth on the walls and the concentration of micro organisms in indoor air.

Microbiological exposure

Author	Country	Design	Settings	n	Finding
Nevalainen et al.	Finland	Cross Sectional	Homes	121 vs. 242	Microbial levels in indoor dust samples were associated with the sum of moisture damage but only weak association to asthma.
Sigsgaard et al.	Denmark	Cross Sectional	Homes	330	Atopic children (IgE) were more sensitized to the moulds Alternaria and Cladosporium if they were exposed to dust at home in the highest quartile
Garret et al.	Australia	Cross Sectional	Schools		Airborn Alternaria sp., Aspergillus niger , were negative associated to acoustic rhinometry measures.
Hernando et al.	USA	Cross Sectional	Homes	109	Endotoxin concentration in dust was negatively associated with both asthma and child emotional health.
Zhao et al.	China	Cross Sectional	10 Schools		Total fungal DNA and Aspergillus/Penicillium-DNA were positively associated with wheeze. Muramic acid in the settled dust was negatively associated with wheeze.
Holme et al.	Sweden	Cross Sectional	Homes	198 vs. 202	No association between indoor air spore concentrations and signs of dampness and moldy odor in the home and no association to asthma and allergy among the children.

Chemicals/Particles

Author	Country	Design	Settings	n	Finding
Larsson et al.	Sweden	Cohort	Homes	4779	PVC as flooring material assoc. with incident asthma and rhinitis.
Gustavsson et al.	Sweden	Cross Sectional	Day Care Centers	2334	PVC flooring assoc. to eczema.
Choi et al.	Sweden	Cross Sectional	Homes	198 vs. 202	Glycol ether concentration in indoor air were associated to doctor diagnosed asthma and allergy as well as IgE sensitization.
Zuraimi et al.	Singapore	Cross Sectional	Homes	2271	Self-reported traffic density was assoc. to asthma and rhinitis symptoms; however, no associations between symptoms and residential height.
Zota et al.	USA	Cross Sectional	Homes	59	Mining waste sources were strong predictors of Pb, Zn, Cd, and As concentrations in house dust. and house dust was a significant predictor of infant body burden for Pb and Cd.

Chemicals/Particles

Author	Country	Design	Settings	n	Finding
Forman et al.		Modelling			The deposition of solid particles (sizes 1, 5 and 10 μm) was computed in the bronchial tree of a child size.
Gillespie-Bennett et al.	New Zealand	Intervention	Homes	409	Installing more effective heaters decreased levels of NO ₂ in our study sample. The reduction in NO ₂ had significant respiratory health benefits for asthmatic children both in terms of symptoms and lung function (PEF, FEV)
Xu et al.	USA	Intervention	Homes	30	Installed air cleaners were able to reduce particle and gas concentrations indoor. Higher PEF rates indicate improvement of the asthma symptoms.

Methods/Studies

Author	Country	Design	Settings	n	Finding
Larsson	Sweden	Cohort			Estimating the incidence rate of allergic symptoms is strongly dependent of how the health status of the baseline population are defined.
Moniruzzaman et al.	Sweden	Birth cohort study		3500 mother child pairs	The SELMA study with the aim to investigate the importance of early life exposure for modern exposures such as endocrine disrupting chemicals (EDCs) for the development of modern diseases such as asthma and allergies, reproductive effects and neuro-psychiatric disorders as well as overweight/obesity and diabetes in later life.

Conclusions

- Dampness/Microbial exposure vs. asthma/allergy
 - Dampness is reported to associate with symptoms (Causal factor?)
 - Different associations betw. asthma/allergy and microbial exposures are reported (negative/positive/no assoc.)
 - Microbial exposure and wheeze!?!
 - No evidence for development of asthma/allergy!
- Chemical/Particle exposure vs. asthma/allergy
 - More and more focus on modern lifestyle chemicals (e.g., SVOCs such as PVC/phthalates, flame retardants, glycol ethers, etc.)?
 - Sources are not only building materials but also a vast number of consumer products
 - How to characterize the exposure (dust, air, biomarkers, etc.)
- Epidemiological design/methods
 - Cohort and Intervention studies are missing
 - Studies on Pathways and Biological Mechanisms are needed
- IEQ is important for children's health!!!!!!
 - Studies needed focusing on the full chain from Sources over Environmental Exposures to Human Uptake and Health Effects.