ASSOCIATIONS OF ENVIRONMENTAL MICROBIAL EXPOSURE WITH DEVELOPMENT OF ASTHMA AND ALLERGIES

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Background and Aims: Studies on farms have suggested that environmental microbial exposure can decrease the risk of developing asthma and allergies. In contrast, studies in moisture damaged homes have shown adverse effects. The present aim was to try to disentangle the differing effects of different microbial species or types of microbes.

Methods: Birth cohorts of rural children, half from farmer families, were followed up in five European centers (n=1034). Associations of surface loads (amounts per m2 sampling surface) of house dust, endotoxin and extracellular polysaccharides (EPS) of Penicillium and Aspergillus spp. (with development of doctor-diagnosed asthma and wheezing by the age of 2 years were assessed using multivariate discrete-time hazard models and GEE. Within the same cohorts a nested case-controls study of current asthma at age 4 years was performed. Mattress dust samples (66 cases, 71 controls) were analyzed using denaturing gradient gel electrophoresis (DGGE) fingerprinting for bacterial community composition. Detected bands were dichotomized at level of detection.

Results: In the whole cohort, the risk of asthma was inversely associated with mainly increasing dust load on mother's mattress (aOR 0.76, 95%CI 0.64-0.90), especially among non-farmers (aOR 0.68, 95%CI 0.54-0.87). Weaker associations were observed for EPS and endotoxin. In the nested case-control study, 42 bands were detected in DGGE. Among these, there was a suggestion (p<0.2) for 4 bands for an inverses association and for 5 band for a positive association with asthma, out of which only one reached statistical significance (aOR 3.1, 95%CI 1.1-9.0). In contrast, 6 significant positive associations with sensitization (>0.7 kU/l) to any food allergen, but none with sensitization to any inhalation allergen were observed.

Conclusions: Present preliminary results suggest that methods for characterizing environmental microbial exposure in more detail may help to disentangle the differing effects of different microbes on development of asthma and allergies.