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**868** Viral Infections in Relation to Age and the Atopic Status of Children Hospitalized for Wheezing

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**RATIONALE:** Viral infections and allergic inflammation are both associated with wheezing during childhood. In this study, the prevalence of viral pathogens and total IgE levels were evaluated among infants and children hospitalized for wheezing.

**METHODS:** 133 wheezing children (ages 2 mos-18 yrs) and 133 age and gender matched controls were enrolled in a 12 month study. Nasal secretions were tested for RSV, influenza, parainfluenza, adenovirus, rhinovirus, coronavirus, and enterovirus by culture, RT-PCR (PCR for adenovirus), and antigen tests for RSV and influenza. Total IgE was measured in sera.

**RESULTS:** The prevalence of viral pathogens among wheezing children by age was 84% (age <3 years, n = 79); 68% (ages 3-9 yrs, n = 34); and 50% (ages 10-18 yrs, n = 20). Among wheezing children <3 years, RSV and influenza were common during the mid-winter months. Only rhinovirus was significantly associated with wheezing from age 3 on (46% in wheezers; 1.8% in controls, p<0.001). Median total IgE levels for wheezing patients in the 3 age groups were 10.5, 389, and 346 IU/ml compared to 5.5, 48, and 31 IU/ml in controls (p<0.01; wheezers vs. controls in the 2 older age groups).

**CONCLUSIONS:** Viral pathogens were common and total IgE levels low among children less than 3 years old. From age 3 on, only rhinovirus was significantly associated with wheezing and the prevalence of viral pathogens decreased with age. The atopic status of wheezing children from age 3 years on, however, was striking and did not decline with age.

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**869** Effect of Farming Environment on Atopic Diseases in Mongolia

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**RATIONALE:** To determine the association of domestic cow dung use with allergen sensitization in rural and urban children in South India.

**METHODS:** ISAAC questionnaire, including information on domestic cow dung use, was used in parent interviews. Prick allergy skin testing for common indoor allergens (cockroach, dust mite, cat, dog, cattle) was performed. Atopy was defined as at least one allergen skin test with a wheal >=3 mm diameter. Dust samples from 24 homes were collected for endotoxin quantification.

**RESULTS:** Regular (ie, daily/weekly) domestic cow dung use was much more common in rural (95%) vs. urban (0%) households (p<0.001). Regular cow dung use in rural households was associated with a lower risk of atopy. No urban households had regular cow dung use. Cow dung use for special occasions in urban households (16%) was associated with a higher risk of atopy. House-dust endotoxin levels were higher in households using domestic cow dung on a regular basis than the non-users or occasional users (medians 6.5x105 vs. 1.6x105 EU/m2, p<0.01).

**CONCLUSIONS:** Regular domestic cow dung use in rural India may protect against the development of atopy by increasing household endotoxin exposure. In contrast, occasional use may be inadequate for a protective effect.

**Funding:** AAAAI (ERT) and NIH/NHLBI K23-HL-04272 (Liu)

**870** Paradoxical Effect of Cow Dung Exposure on Childhood Atopy in Rural and Urban Children in South India

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**OBJECTIVE:** To determine the association of domestic cow dung use with allergen sensitization in rural and urban children in South India.

**METHODS:** The study was performed in two locations in South India, Mysore (an urban center) and Vinobha (a rural village 25 miles from Mysore). The study was performed in two locations in South India, Mysore (an urban center) and Vinobha (a rural village 25 miles from Mysore). The study was performed in two locations in South India, Mysore (an urban center) and Vinobha (a rural village 25 miles from Mysore).

97 rural and 67 urban children, ages 6 to 16 years, were studied. A modified ISAAC questionnaire, including information on domestic cow dung use, was used in parent interviews. Prick allergy skin testing for common indoor allergens (cockroach, dust mite, cat, dog, cattle) was performed. Atopy was defined as at least one allergen skin test with a wheal >=3 mm diameter. Dust samples from 24 homes were collected for endotoxin quantification.

**RESULTS:** Regular (ie, daily/weekly) domestic cow dung use was much more common in rural (95%) vs. urban (0%) households (p<0.001). Regular cow dung use in rural households was associated with a lower risk of atopy. No urban households had regular cow dung use. Cow dung use for special occasions in urban households (16%) was associated with a higher risk of atopy. House-dust endotoxin levels were higher in households using domestic cow dung on a regular basis than the non-users or occasional users (medians 6.5x105 vs. 1.6x105 EU/m2, p<0.01).

**CONCLUSIONS:** Regular domestic cow dung use in rural India may protect against the development of atopy by increasing household endotoxin exposure. In contrast, occasional use may be inadequate for a protective effect.

**Funding:** AAAAI (ERT) and NIH/NHLBI K23-HL-04272 (Liu)

**871** Does the Immune Response to Cat Among Children Living with a Cat Influence the Prevalence of IgE to Dog and Birch?

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**OBJECTIVE:** To determine the association of domestic cow dung use with allergen sensitization in rural and urban children in South India.

**METHODS:** ISAAC questionnaire, including information on domestic cow dung use, was used in parent interviews. Prick allergy skin testing for common indoor allergens (cockroach, dust mite, cat, dog, cattle) was performed. Atopy was defined as at least one allergen skin test with a wheal >=3 mm diameter. Dust samples from 24 homes were collected for endotoxin quantification.

**RESULTS:** Regular (ie, daily/weekly) domestic cow dung use was much more common in rural (95%) vs. urban (0%) households (p<0.001). Regular cow dung use in rural households was associated with a lower risk of atopy. No urban households had regular cow dung use. Cow dung use for special occasions in urban households (16%) was associated with a higher risk of atopy. House-dust endotoxin levels were higher in households using domestic cow dung on a regular basis than the non-users or occasional users (medians 6.5x105 vs. 1.6x105 EU/m2, p<0.01).

**CONCLUSIONS:** Regular domestic cow dung use in rural India may protect against the development of atopy by increasing household endotoxin exposure. In contrast, occasional use may be inadequate for a protective effect.

**Funding:** AAAAI (ERT) and NIH/NHLBI K23-HL-04272 (Liu)

**872** The Effect of Mite Allergen-Impermeable Covers in Adult Asthma: The SMAC Study

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Public Health Sciences, St. George’s Hospital Medical School, London, UNITED KINGDOM, 5Southampton General Hospital, Southampton, UNITED KINGDOM, 6London School of Hygiene and Tropical Medicine, London, UNITED KINGDOM.

RATIONALE: The effectiveness of mite allergen avoidance in asthma is controversial.

METHODS: Randomized, double-blind, placebo-controlled study of allergen-impermeable covers (mattress, pillow, quilt) in 1122 adult asthmatics.

RESULTS: Prevalence of mite sensitivity was 65.4% (active) and 65.1% (placebo). Der p 1 was significantly lower in the active group at 6 months (p=0.01), with no difference between the groups at 12 months. 457 active and 459 placebo patients had PEFR data at baseline and 6 months. PEFR improved significantly in both groups (l/min, Active 409.7 to 417.7, p=0.0001; Placebo 419.3 to 428.9, p=0.0001). After adjusting for baseline differences (ANOVA) there was no significant difference between the groups (difference in means [95% CI], active vs. placebo: all subjects -2.11 [-6.55, 2.32], p=0.35; mite-sensitive -1.71 [-7.28, 3.85], p=0.55). There was no difference between the groups in complete cessation of steroid therapy. During months 7-12, a controlled inhaled steroids reduction was attempted (until steroid has been discontinued or asthma control deteriorated). Homes were visited at entry (all subjects), and 6 and 12 months (10% random sample) to collect mattress dust for Der p 1 measurement. PEFR was recorded twice-daily for 4 week-period during run-in and months 6 and 12. In the first 6 months patients took their usual inhaled steroid therapy. During months 7-12, a controlled inhaled steroids reduction was attempted (until steroid has been discontinued or asthma control deteriorated).

CONCLUSION: Allergen-impermeable covers seem clinically ineffective in adult asthma.

Funding: NHS R&D

873 Dust and Airborne Endotoxins Exposure in the Urban Dwellings of Strasbourg Area, France

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BACKGROUND: It has been demonstrated that in asthmatics sensitized to house dust mite allergen, asthma severity was more correlated with endotoxins dust levels rather than that of allergen. Meaning the concentration of endotoxins in the air could be reflective of the respiratory tract exposure.

AIM: To measure endotoxins levels in randomly selected dwellings and to determine which home characteristics could influence these concentrations in dust and air.

METHODS: Individual air samples (3 of 8 hours) and 38 dust samples were collected in 77 urban dwellings. Endotoxins levels were determined using a standardized Limulus Amebocyte Lysate test. Home environment questionnaire were completed.

RESULTS: Airborne endotoxins levels were 0.18 ng g-1 (n=231) (95% CI: 0.134-0.242 ng m-3). No significant connection with any of the dwellings characteristics was recorded. The mean concentration of endotoxin in bedroom floor dust was 1.08 µg g-1 (n=27) (95% CI: 0.696-1.466 µg g-1). There was no association with the home characteristics studied.

CONCLUSIONS: Both air and dust endotoxins levels were not associated with the home characteristics recorded. No correlation was reported between the dust and airborne endotoxins levels in domestic environment. According to the endotoxins levels found in the dwellings, it would take 20 years to inhale 20 µg of endotoxin which has been published as the amount of endotoxins responsible for the symptoms in asthmatics.

874 Effects of Home Visitation on ETS Exposure Among Wheezing Children from Low-Income Families

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RATIONALE: Environmental Tobacco Smoke (ETS) exposure can worsen respiratory symptoms and is an important target for intervention in families with asthmatic children.

METHODS: The Childhood Asthma Prevention Study recruited low-income families who had young children with repeated wheezing. Families had 3 home-based assessments that included a mental health screen, ETS beliefs, and child urine cotinine analysis during the first year of the study. Half of the families were randomized to an intervention where a nurse made home visits for one year. The goal of the intervention was to work with the caregivers on reducing triggers and improving illness management.

RESULTS: At baseline, almost all caregivers (n=148) believed ETS was harmful to their child (97%) and reported they were able to keep their child away from ETS (97%). Baseline child cotinine levels were associated with number of smokers in the home: none, someone other than caregiver, caregiver only, and caregiver and another (p<0.0001). Repeated measures analysis for cotinine level across time showed no difference between intervention groups (p=0.66). Interestingly, higher cotinine levels were found through the year in those children whose caregivers reported more depression (p=0.04). The addition of caregiver depression level to the repeated measures analysis of cotinine showed a significant interaction between group and depression across time. The child cotinine levels decreased in the families in the intervention group for whom the caregivers reported more depression (p<0.01).

CONCLUSIONS: Nurse home intervention was successful in reducing ETS exposure in a high-risk population with elevated caregiver depression.

Funding: NIH

875 Polycyclic Aromatic Hydrocarbons (PAHs) Enhance IgE-Mediated Histamine Release and IL-4 Production in Human Basophils

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Polycyclic aromatic hydrocarbons (PAHs) are major components of diesel exhaust particles (DEP) found in pollutant respirable particles. There is growing evidence that these fossil fuel combustion products exacerbate allergic inflammation. Basophils contribute to allergic inflammation through the release of preformed and granule-derived mediators. To determine if allergens and PAHs interact, we incubated human basophils with PAHs, and measured the release of histamine and IL-4 with and without added antigen. None of the PAHs induced mediator release by themselves and none affected total cellular histamine levels. However, several PAHs enhanced histamine release and IL-4 production in response to crosslinking the high affinity IgE receptor, FceRI. The enhancement seen with 1,6-BPQ involved an increase in tyrosine phosphorylation in several different substrates, including the FceRI-associated tyrosine kinase, Lyn, and elevated reactive oxygen species (ROS) levels detected by dichlorofluorescein (DCF) fluorescence and flow cytometry. These data provide a potential link between exposure to environmental pollutants and exacerbation of allergic inflammation through enhanced FceRI-coupled mediator release from human basophils.

Funding: Grant Monies