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Can the Use of HEPA Cleaners in Homes of Asthmatic Children and Adolescents Sensitized to Cat and Dog Allergens Decrease Bronchial Hyperresponsiveness and Allergen Contents in Solid Dust?

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atopic families tended to have pets less frequently, which might have introduced confounding effects.

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Sulser C, Schulz G, Wagner P, et al. *Int Arch Allergy Immunol.* 2009;148(1):23–30

PURPOSE OF THE STUDY. Because pet allergies are associated with asthma, the authors investigated whether high-efficiency particulate-arresting (HEPA) filtration had any effect on reducing indoor allergens and bronchial hyperreactivity in children with asthma who were sensitized to cat and dog.

STUDY POPULATION. A total of 30 children with asthma (age: 6–17 years) who were sensitized and exposed to cat and/or dog allergen(s) at home completed the study. The children did not have dust mite or mold sensitivities, and those being treated for asthma stayed on treatment throughout this time.

METHODS. This was a randomized, controlled trial in which the children were assigned to 1 of 2 groups. For 12 months, 1 group was exposed to HEPA air cleaners that were placed in the living room and bedroom, and the other group was exposed to paper sham filters. Filters were on for >50% of the time. Pulmonary function testing and cold-air challenges were performed at baseline, 6 months, and 12 months into the study. Serum eosinophil cationic protein, specific immunoglobulin E to several aeroallergens, current medications, and clinical symptoms (nighttime awakenings, physical exercise symptoms, breathing limitations, and nasal stuffiness) were assessed. The amounts of cat (Fel d 1) and dog (Can f 1) allergens in the filters and bulk dust samples were also collected.

RESULTS. Forced expiratory volume in 1 second at baseline lung function improved in the entire study population (median: 90% at initial visit, 98% at 6 months, and 95% at 12 months; $P < .01$). However, there was no significant change in eosinophil cationic protein, use of medication, or quality of life for the 2 groups. Although after 12 months there seemed to be a trend for a decrease in change in forced expiratory volume in 1 second after cold-air challenge in the active group (8.1%–5.4%) versus the sham group (4.3%–8.2%), the difference was not statistically significant ($P = .336$). Active filters retained higher amounts of cat and dog allergens in their main filter devices, compared with sham filters.

CONCLUSIONS. Although HEPA air cleaners were able to retain airborne pet allergens, they had no significant effect on bronchial hyperreactivity.

REVIEWER COMMENTS. High-efficiency air filtration is often recommended to patients with asthma with known allergenic sensitivities, to reduce exposure to indoor pet allergens (which are ~5 μm in size). HEPA filtration can filter out particles as small as 0.3 μm with up to 99.97% efficiency. This study did not find a significant effect of HEPA filtration on bronchial hyperreactivity after 1 year of use, but there seemed to be a trend toward improvement in bronchial hyperreactivity. Although this study revealed a very limited role for HEPA use in asthma therapy, future studies should evaluate whether HEPA filtration may help prevent or delay the development of asthma in younger children with atopy who are at increased risk of developing asthma.

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Higher Immunoglobulin E Antibody Levels to Recombinant Fel D 1 in Cat-Allergic Children With Asthma Compared With Rhinoconjunctivitis

Grönlund H, Adédoyin J, Reininger R, et al. *Clin Exp Allergy*. 2008;38(8):1275–1281

PURPOSE OF THE STUDY. To measure immunoglobulin E (IgE) and IgG_4 antibodies to an engineered recombinant major cat allergen, rFel d 1, among sera from cat-allergic children and adults.

STUDY POPULATION. One hundred forty cat-allergic children and adults with rhinoconjunctivitis and/or asthma were selected; all had positive skin-prick test results to cat dander extract (CDE). Seventy-five healthy, age-matched, CDE-skin-test–negative children and adults were selected as control subjects.

METHODS. Sera from the 140 patients were tested for IgE and IgG_4 antibodies to CDE and rFel d 1 by ImmunoCAP (Phadia, AB Uppsala, Sweden) and for IgE to rFel d 1 by enzyme-linked immunosorbent assay.

RESULTS. Ninety-eight percent of patients (all but 1) and none of the control subjects had evidence of specific IgE to rFel d 1. Specific IgE results to rFel d 1 and CDE correlated strongly ($r_s = 0.85$; $P < .001$) among the 140 patients; however, results to rFel d 1 were, on average, 30% higher ($P < .0001$). IgE responses to rFel d 1 among children with asthma were higher (median: 19.4 kU/L), compared with children with rhinoconjunctivitis only

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