mice. Future studies will no doubt address the applicability of these findings to humans.

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ENVIRONMENTAL ALLERGENS

DISTRIBUTION AND REMOVAL OF CAT, DOG, AND MITE ALLERGENS ON SMOOTH SURFACES IN HOMES WITH AND WITHOUT PETS


Purpose of the Study. To characterize the distribution of dog (Can f 1), cat (Fel d 1), and mite (Der p 1 and Der f 1) allergens on hard surfaces in homes with and without pets and to evaluate the efficiency of removing allergen from hard surfaces by wiping with a dry dust cloth and by vacuum cleaning using the dust brush attachment.

Study Population. Dust samples were collected from 24 homes in Dayton, Ohio, that met the following criteria: having at least 1 area with a large amount of smooth, hard-surfaced wall; 2 hard surface floors in 2 separate rooms; sufficient hard furniture surfaces; and lack of cleaning of floors, furniture, and walls for 7 days.

Methods. Two adjacent 1-square meter areas of smooth flooring in 2 separate rooms and a wall were selected and marked out for dust sampling. At each sampling area, half of the area was dusted by wiping with a Pledge Grab-It (SC Johnson, Racine, WI) dust cloth. The adjacent area was then dusted with a vacuum cleaner using the dust brush attachment. The concentrations of Der f 1, Der p 1, Fel d 1, and Can f 1 allergens were determined from each sample.

Results. Dust from hard surfaces and carpets in homes with cats had significantly (P < .05) more Fel d 1 than homes without cats. This is in contrast to the mean levels of Can f 1 on walls and furniture in homes without dogs, which was not significantly less (P > .05) than for homes with dogs. The levels of mite allergen detected on hard surfaces was very low, with 16, 21, and 17 of the 24 homes having no detectable Der f 1 or Der p 1 on smooth floors, walls, and furniture respectively. The mean total quantity of allergen collected by the Grab-It dust cloths was 1.05 to 3.4 times greater than the brush-vacuuming method.

Conclusions. As expected, significantly greater amounts of Fel d 1 were found in individual homes with cats compared with those without cats. A key finding in this study, however, was that detectable levels of dog allergen were present in all but one of the homes without dogs. Sixty-seven percent of homes without cats had measurable Fel d 1 levels present as well. This is postulated to be secondary to passive transfer of allergens from clothing, previous presence of a pet, or visioned by pets. From the data presented, carpeting is the major reservoir for pet allergen. Finally, dusting with a dust cloth was found to be a more effective method of removing allergen from hard surfaces than vacuum cleaning using a dust brush attachment.

Reviewers’ Comments. This article stresses the need for environmental control measures not only in homes with pets, but also in those without. We often must remind our patients, even those that live without pets, to clean their surroundings in an effective manner. This study also demonstrates that it is important to include cleaning walls, furniture, and smooth floors along with carpeting to reduce exposure to indoor allergens. This should greatly improve the quality of life for those that suffer from allergic disease.

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HOUSE DUST MITE, CAT, AND COCKROACH ALLERGEN CONCENTRATIONS IN DAY CARE CENTERS IN TAMPA, FLORIDA


Purpose of the Study. Indoor allergen exposure in early childhood is a known risk factor for allergic sensitization and the development of asthma. This study specifically seeks to determine the concentration of various indoor allergens in day care centers in a humid environment and compare them with their reported normal household levels.

Study Population. A total of 20 day care centers in Tampa, Florida, were surveyed for mite, cat, and cockroach allergens by collecting 1 dust and 2 air samples (1 during the day and 1 during the night).

Methods. Day care center selection was achieved by asking managers for permission to participate in the study and allow collection of dust and air samples. Questionnaires regarding building age, floor covering, and use of insecticide were obtained. Dust samples were collected from a 1-square meter area for 2 minutes by a 1.7 peak horsepower vacuum cleaner. The filters were subsequently removed and transported to the laboratory in a sterile manner. Dust samples were extracted and specifically analyzed for mite (Der p 1 and Der f 1), cat (Fel d 1), and cockroach (Per a 1) allergens. Airborne mite concentrations were analyzed by radioallergosorbent test inhibition.

Results. Four day care centers were noted to have linoleum floors. The rest of the buildings had wall-to-wall carpeting. Mites were identified in dust samples 15 day care centers with allergen levels >2 µg/g of dust, the suggested threshold level for sensitization to group 1 mite allergens, in 40% of the centers. Cat allergen levels were detected in all centers, but were consistently below the suggested threshold sensitization level of 8 µg of Fel d 1 per gram of dust. Cockroach allergen was also found in all the day care centers in variable quantity. Threshold levels for sensitization to Per a 1 have not been established, but the levels detected were similar to typical levels in homes in Tampa.

Conclusions. Dust mite, cat, and cockroach allergens were present in all day care centers in this humid environment. Mite allergen levels in dust exceeded levels associated with sensitization in 40% of the centers. Levels of cat allergen were noted to be lower than levels in homes with cats and were consistently less than known concentrations for sensitization and symptoms. Cockroach allergen was detected in all day care centers in varying levels, similar to levels in local homes.

Reviewers’ Comments. As the authors note, the prevalence of asthma and sensitization to indoor allergens in children attending day care centers in the United States is unknown. Also unknown is the correlation between indoor air quality and respiratory symptoms in the preschool child. Asthma and allergic disease prevalence in the children attending the day care centers were not reported in this study. Allergen exposure in early childhood is known to be a large risk factor for the development of asthma. And it has been documented that symptoms in children with
allergic disease improve after removal from an environment with a large allergen burden. This study furthers our understanding regarding allergen exposure in day care centers. The relationship between allergen burden and development of allergic disease was not looked at in this study.

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PREDICTION AND PREVENTION

ALLERGY DEVELOPMENT AND THE INTESTINAL MICROFLORA DURING THE FIRST YEAR OF LIFE


Purpose of the Study. Numerous studies have demonstrated that the prevalence of atopic diseases is lower in the Central and Eastern European countries as compared with Western European countries. The intestinal microflora is a likely source for the induction of immune deviation in infancy. The purpose of this study was to prospectively relate the intestinal microflora to allergy development in 2 countries differing with respect to the prevalence of atopic disease.

Study Population. A cohort of 24 infants in Estonia and 20 infants in Sweden followed prospectively through the first 2 years of life.

Methods. Stool samples were obtained at 5 to 6 days and at 1, 3, 6, and 12 months, and 13 groups of aerobic and anaerobic microorganisms were cultivated through use of standard methods. Allergic status was defined as presence of atopic dermatitis and/or at least 1 positive skin test result. Skin prick testing was performed at 3 and 6 months to fresh egg white and cow’s milk. At 1 and 2 years of age, skin testing to dust mites, cat, dog, cockroach, birch, and timothy were conducted.

Findings and Results. By the age 2 years, 9 Estonian and 9 Swedish infants developed atopic dermatitis and/or positive prick skin test result. In comparison with healthy infants, infants who developed allergy were less often colonized with enterococci during the first month of life (72% vs 96%; P < .05) and with bifidobacteria during the first year of life (17%–39% vs 42%–69%; P < .05). Furthermore, allergic infants had higher counts of clostridia at 3 months (median value: 10.3 vs 7.2 log10; P < .05). The prevalence of colonization with Staphylococcus aureus was also higher at 6 months (61% vs 23%; P < .05), whereas the counts of Bacteroides were lower at 12 months (9.9 vs 10.6 log10; P < .05).

Conclusions. Differences in composition of the gut flora between infants who will and infants who will not develop allergy are demonstrable before the development of any clinical manifestations of atopy. Because the observations were made in 2 countries with different standards of living, these findings could indicate a role for the intestinal microflora in the development and protection from allergy.

Reviewer’s Comments. According to the “hygiene hypothesis,” atopy results from the imbalance between Th1 and Th2 type immune responses. Microbial stimulation is associated with induction of interleukin (IL)-12 and Th1-type responses. Therefore, an early and more extensive colonization with aerobic bacteria in healthy infants could conceivably protect from development of atopy. Additional studies are needed to elucidate the prophylactic potential of supplementation with probiotic microorganisms such as Lactobacillus or Bifidobacterium sp.
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