determined whether the 2 groups had ever been advised to make changes in their homes to reduce dust mite exposure (knowledge) and whether they had made any changes in their homes to reduce dust mite exposure (practice).

Results. The study families were predominately white (50%) or African American (35%). All of the children demonstrated positive skin test results for dust mite allergen, 61% (n = 69) had been examined and skin-tested by an allergist before enrolling in the study, and 4% were currently receiving immunotherapy. Fifty-six of the 69 families (81%) that had visited an allergist reported receiving advice regarding general indoor environmental control, compared with 22 families (49%) that had not visited an allergist (P < .0001). With respect to specific dust mite recommendations, families that had been evaluated by an allergist had significantly more dust mite knowledge (70% vs 18%, P < .0001). Families that had visited an allergist demonstrated a significantly greater frequency of knowledge regarding the need for mattress encasement (61% vs 13%, P < .001) and pillow encasement (51% vs 11%, P < .0001), compared with the non-allergist-treated group. Families that had visited an allergist demonstrated somewhat greater implementation of dust mite control recommendations, compared with families that had visited a pediatrician (68% vs 56%, P = .063). The use of mattress and pillow encasement was significantly greater (38% vs 11%, P = .001, and 36% vs 16%, P = .009, respectively) in the allergist-treated group than in the pediatrician-treated group. To evaluate adherence, comparisons of each family’s knowledge of specific recommendations with the changes made in the household were made. Of the families that had visited an allergist, 70% had knowledge of dust mite control measures and 60% of those families made at least 1 of the 4 observable changes in their households to reduce dust mite allergen exposure. Of the families that had visited a pediatrician, 18% had knowledge of dust mite control recommendations and 63% of those families made changes in their households.

Conclusions. Parents of dust mite-sensitive, asthmatic children who visited an allergist were more aware of dust mite allergen control recommendations and made more indoor environmental changes. Allergists are able to perform specific tests to determine allergies and can offer directed education regarding environmental control measures.

Reviewer’s Comments. This study emphasizes the importance of identifying allergy triggers. Without knowledge of specific allergy triggers, guidelines for environmental controls can only be vague. When given specific advice, patients appeared to be equally motivated, regardless of which physician provided the environmental control advice. However, a limitation of the study, as the authors noted, was that the subjects in the study were predominantly middle-class children; patients in lower socioeconomic groups might have different outcomes. In addition, depending on the type of insurance (if any), patients might not have easy accessibility to an allergist.

HELEN SKOLNICK, MD
Princeton, NJ

FUNGAL LEVELS IN THE HOME AND LOWER RESPIRATORY TRACT ILLNESSES IN THE FIRST YEAR OF LIFE


Purpose of the Study. Previous studies found a relationship between home dampness and lower respiratory tract symptoms among children. Is this relationship attributable to exposure to fungi, which thrive in damp conditions?

Study Population. A birth cohort of 499 children with a history of asthma or allergy for at least 1 parent was studied.

Methods. During a home visit, when the child was 2 or 3 months of age, a technician determined household and socioeconomic characteristics and obtained air and dust samples. Every 2 months thereafter, a follow-up telephone questionnaire, regarding respiratory symptoms and illnesses experienced by the child, was administered to the child’s primary caregiver. In-home fungal concentrations were evaluated as predictors of lower respiratory tract illnesses (LRI) (croup, pneumonia, bronchitis, and bronchiolitis) in the first 1 year of life.

Results. In multivariate analyses, after controlling for gender, the presence of water damage or visible mold/ mildew, being born in winter, breastfeeding, and being exposed to other children through siblings, the authors found a significantly increased relative risk (RR) of LRI with high levels (>90th percentile) of airborne Penicillium (RR: 1.73; 95% confidence interval [CI]: 1.23–2.43), dustborne Cladosporium (RR: 1.52; 95% CI: 1.02–2.25), Zygomyces (RR: 1.96; 95% CI: 1.35–2.83), or Alternaria (RR: 1.51; 95% CI: 1.00–2.28), or any fungus (RR: 1.86; 95% CI: 1.21–2.88).

Conclusions. Exposure to high fungal levels increased the risk of LRI in infancy. The actual mechanisms remain unknown. Sensitivity to inhaled allergens, including mold, as measured with skin testing or radioallergosorbent testing, is uncommon in infancy, and this association in infancy is likely to be nonallergic.

Reviewer’s Comments. These are interesting and potentially useful findings, but more study is required. It should be noted that no increase in LRI was associated with high levels of exposure to a large number of other individual fungi evaluated. As the authors pointed out, “People are routinely exposed to >200 different species of fungi. Exposure occurs universally and is impossible to avoid completely. Often there are no adverse effects from these exposures.” It is hoped that solid scientific work such as this will not be misconstrued to bolster the mold hysteria prevalent in many parts of the country, resulting in expensive and unnecessary mold removal projects.

John M. Kelso, MD
San Diego, CA

β-ADRENERGIC AGONIST THERAPY

COMPARISON OF RACEMIC ALBUTEROL AND LEVALBUTEROL FOR TREATMENT OF ACUTE ASTHMA


Purpose of the Study. Inhaled β-receptor agonists are widely used to treat bronchospasm and acute asthma exacerbations. Recently, a new β agonist, levalbuterol, which is the R-isomer of albuterol, was introduced. This study was conducted in an acute setting, to compare albuterol and levalbuterol.

Methods. This was a randomized, double-blind, controlled trial conducted in the emergency department and inpatient asthma care unit of a children’s hospital. Children were 1 to 18 years of age; the study group included 482 patients, with a total of 547 enrollments. Patients received a nebulized solution of either 2.5 mg of racemic albuterol or 1.25 mg of levalbuterol every 20 minutes, for a maximum of 6 doses. Children subsequently admitted to
the asthma care unit were treated in a standardized manner, with continued administration of the drugs assigned in the emergency department. The primary outcome parameter was hospitalization rate.

**Results.** The hospitalization rate was significantly lower for the levalbuterol group (36%) than for the racemic albuterol group (45%, \( P = .02 \)). The adjusted relative risk of admission for the racemic albuterol group, compared with the levalbuterol group, was 1.25 (95% confidence interval: 1.01–1.57). There was no difference in the lengths of hospital stays, and there were no significant adverse events in either group.

**Conclusion.** Substituting levalbuterol for racemic albuterol in the emergency department treatment of acute asthma significantly reduced the number of hospitalizations.

**Reviewer’s Comments.** Additional prospective trials, including pulmonary function studies and economic analyses, will be necessary to justify the use of levalbuterol, rather than albuterol, as standard practice.

**Christopher Randolph, MD**

Waterbury, CT

**COMPARATIVE EFFICACY OF TERBUTALINE SULFATE DELIVERED BY TURBUHALER DRY POWDER INHALER OR PRESSURIZED METERED-DOSE INHALER WITH NEBUHALER SPACER IN CHILDREN DURING AN ACUTE ASTHMATIC EPISODE**


**Purpose of the Study.** Several previous studies demonstrated that the bronchodilator effect of a metered-dose inhaler (MDI) with spacer was just as good as that of a nebulizer for treatment of acute asthma exacerbations among children. What about a MDI with spacer versus a dry powder inhaler (DPI)?

**Study Population.** A total of 112 children with asthma, 6 to 16 years of age, who presented to an emergency department with asthma exacerbations were studied. Baseline forced expiratory volume in 1 second (FEV₁) values were 25 to 60% of predicted values.

**Methods.** Patients were randomized to receive terbutaline through either a MDI with spacer or a DPI (Turbuhaler, AstraZeneca, Lund, Sweden). Doses were administered at 0 and 30 minutes, and FEV₁ values were measured at 0, 30, and 60 minutes.

**Results.** No differences in increases in FEV₁ were seen at 30 minutes (MDI with spacer: 35%; DPI: 33%) or 60 minutes (MDI with spacer: 50%; DPI: 49%). There were also no differences in oxygen saturation or heart rates.

**Conclusion.** For treatment of acute asthma exacerbations among children ≥6 years of age, delivery of a bronchodilator with a DPI works just as well as delivery with a MDI with spacer.

**Reviewer’s Comments.** The Environmental Protection Agency and the Food and Drug Administration are mandating that current MDIs be phased out, because of the adverse environmental effects of chlorofluorocarbon propellants. Inhaler manufacturers have complied either by using more environmentally friendly propellants (such as hydrofluoroalkanes) or by eliminating the propellant entirely in DPIs. It is reassuring to know that, even in acute asthma exacerbations, children ≥6 years of age can effectively use a DPI for delivery of bronchodilator.

**John M. Kelso, MD**

San Diego, CA

**RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL OF ORAL ALBUTEROL IN INFANTS WITH MILD-TO-MODERATE ACUTE VIRAL BRONCHIOLITIS**


**Purpose of the Study.** To determine whether oral albuterol therapy is effective in reducing symptoms of mild/moderate acute viral bronchiolitis.

**Study Population.** A total of 129 previously healthy infants (<12 months of age) discharged directly home from the emergency department (ED), with a clinical diagnosis of acute viral bronchiolitis, were studied.

**Methods.** At discharge from the ED, patients were randomly assigned to receive either oral albuterol (0.1 mg/kg per dose) or oral placebo treatment. Infants were treated 3 times daily for a maximum of 7 days or until complete resolution of bronchiolitis symptoms, whichever happened first. Overall health, medication compliance, feeding and sleeping patterns, follow-up visits, parental life disruptions, and adverse events were discussed in daily telephone interviews until the resolution of symptoms or for 14 days. The primary outcome of interest was the time from study enrollment until the resolution of illness, as determined by the primary caregiver. Secondary outcomes of interest included duration of cough, coryza, and noisy breathing, time to normal feeding, and time to normal sleeping.

**Results.** During the study, 1039 infants were discharged from the hospital ED with acute viral bronchiolitis. Of those, 231 were eligible and 129 were randomized into the study. The mean ages were 5.4 months for the albuterol group and 5.1 months for the placebo group. Respiratory syncytial virus was the pathogen found most frequently (albuterol: 81%; placebo: 79%) in nasopharyngeal aspirates collected from 61 infants in the 2 groups. The median number of days of illness before ED presentation for both groups was 4.0 days. The mean times to the resolution of illness were similar for the 2 groups (albuterol: 8.9 days; placebo: 8.4 days). There were no significant differences in secondary outcomes between the groups. Hospitalization for treatment of respiratory distress was eventually required for 4 infants in the albuterol group and 5 in the placebo group. There were similar median numbers of health care revisits for the 2 groups (albuterol: 1; placebo: 0). There were also similar median numbers of days in which trembling and vomiting were observed (albuterol: 0 and 1; placebo: 0 and 1, respectively).

**Conclusions.** There was no significant difference in symptom resolution for newly diagnosed bronchiolitis treated with orally administered albuterol versus placebo. The authors did not recommend the use of orally administered albuterol for this patient population.

**Reviewers’ Comments.** Although previous studies found similar results, most outcomes in this study were based solely on subjective evaluations by the primary caregiver at home. The authors present compelling evidence that orally administered albuterol, at the dose used in this study, has little role in the treatment of bronchiolitis among infants. However, the dose of albuterol was at the low end of the recommended dose range of 0.1 to 0.2 mg/kg per dose, administered 3 times daily.

**Joseph Shapiro, MD**

Michael S. Kaplan, MD

Los Angeles, CA
# COMPARISON OF RACEMIC ALBUTEROL AND LEVALBUTEROL FOR TREATMENT OF ACUTE ASTHMA

Christopher Randolph

*Pediatrics* 2004;114;541

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