










A multifaceted, home based, environmental intervention modestly reduced asthma morbidity in children with atopic asthma

Morgan WJ, Crain EF, Gruchalla RS, *et al.* Results of a home-based environmental intervention among urban children with asthma. *N Engl J Med* 2004;**351**:1068–80.

Clinical impact ratings Paediatrics ★★★★★☆ Respiriology ★★★★★☆ Immunology ★★★★★☆
Allergy and Immunology ★★★★★☆

Q In inner city children with atopic asthma, is a multifaceted, home based, environmental intervention (HBEI) effective for improving asthma related outcomes?

METHODS

-  **Design:** randomised controlled trial.
-  **Allocation:** {concealed*}†.
-  **Blinding:** blinded (clinical outcome assessors).*
-  **Follow up period:** 1 year of intervention followed by a 1 year observational period.
-  **Setting:** 7 major cities in the US.
-  **Patients:** 937 children 5–11 years of age (mean age 7.7 y, 63% boys) with atopic asthma who were residents of census tracts in which ≥20% of the households had incomes below the federal poverty level. Children were also required to have had ≥1 asthma related hospital admission or 2 unscheduled, asthma related visits to the clinic or emergency department during the previous 6 months and a positive skin test in response to ≥1 of 11 indoor allergens.
-  **Intervention:** a 1 year HBEI (n=469) or home evaluation only (control group, n=468). The goal of the HBEI (tailored to each child's sensitisation and environmental risk profile) was to provide the child's caretaker with education and resources necessary to perform a comprehensive environmental remediation for exposure to both allergens and tobacco smoke. All families received visits for home evaluation (including measurement of allergen concentrations) at baseline and at 6 month intervals throughout the study.
-  **Outcomes:** maximal number of days with symptoms (defined as the largest value among the following 3 variables: number of days with wheezing, tightness in the chest, or cough; number of nights with disturbed sleep as a result of asthma; and number of days on which the child had to slow down or discontinue play activities because of asthma) in the 2 weeks before the telephone interview (done every 2 months throughout the study).
-  **Patient follow up:** 93% at 1 year and 88% at 2 years (intention to treat analysis).

*See glossary.
†Information provided by author.

MAIN RESULTS

The mean maximal number of days with symptoms per every 2 week period was lower in the HBEI group than in the control group during both the first (3.4 v 4.2 d, p<0.001) and second years (2.6 v 3.2 d, p<0.001). Reduction in allergen concentrations (eg, *Dermatophagoides farinae* and the cockroach allergen *Bla g1* in the bedroom) was greater in the HBEI group than in the control group (p values <0.05). In the HBEI group, a reduction in dust mite and cockroach allergens was associated with improvements in asthma related morbidity (p values <0.05).

CONCLUSION

In inner city children with atopic asthma, a multifaceted, home-based, environmental intervention reduced exposure to indoor allergens and had a modest impact on asthma related morbidity.

Commentary

Morgan *et al* show that it is possible to lower the levels of allergens at home and thus obtain a reduction of asthma associated morbidity in children with atopic asthma through the use of a multifactorial approach, which includes family education and use of home environmental interventions. Despite the study's high quality methods, it is questionable whether the intervention could be easily reproduced in real life. The intervention was particularly complex, and enrolled families were monitored by regular visits and telephone calls to reinforce training and motivations. Moreover, the resources required to equip houses appear more feasible for well-off families than for the poor urban ones recruited in this study. No trials have used this strategy in patients with more favourable social conditions or less indoor pollution or in less severely affected children, so no inference is possible for these populations.

Overall, the clinical results of this multifactorial intervention (34 fewer days with reported wheezing over 2 years) are less impressive than those achieved with a twice daily dose inhaled steroid treatment, which leads to a greater decrease in the rate of hospital admissions, emergency care visits, and need for oral steroids.¹ Therefore inhaled steroids remain the most effective long term therapy for asthma.

This trial represents, however, a success for a real clinical problem that is particularly relevant in the US. Unlike previous studies, it has been able to show an apparent clinical benefit for the reduction of home exposure to cockroach allergens, a risk factor even more important than mite exposure for inner city children with asthma.

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1 The Childhood Asthma Management Program Research Group. Long-term effects of budesonide or nedocromil in children with asthma. *N Engl J Med* 2000;**343**:1054–63.

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