

Correspondence

Cost-effectiveness of home-based interventions should also take into account nonrespiratory indoor health hazards

To the Editor:

Kattan et al.¹ recently reported a cost-effectiveness analysis of a home-based environmental intervention for inner city children with asthma. They concluded that the intervention cost was \$27.57 per additional symptom-free day. Of note, the intervention was targeted at reducing mite and tobacco smoke exposure but not at other indoor risks. Indeed, these risks are many. A recent report from the World Health Organization lists 10 main indoor risks, among which house dust mite and tobacco smoke are only 2, and advocates a global approach to indoor risks.² Actually, it is a pity not to take advantage of the home-based visit to perform such a global evaluation. Doing so, the cost-effectiveness analysis may be much more favorable, because some nonrespiratory risks such as domestic accidents are very common and might be prevented by appropriate advice to the family. For example, according to a recent French survey, 15.9% of boys and 12.6% of girls have had a domestic accident during the last 12 months.³

Denis André Charpin, MD, MPH

From the Chest Diseases and Allergy Department, Hôpital Nord, Chemin des Bourrelly, Marseille, Cedex 20, 13015, France.

Disclosure of potential conflict of interest: The author has declared he has no conflict of interest.

REFERENCES

1. Kattan M, Stearns SC, Crain EF, Stout JW, Gergen PJ, Evans R III, et al. Cost-effectiveness of a home-based environmental intervention for inner-city children with asthma. *J Allergy Clin Immunol* 2005;116:1058-63.
2. World Health Organization. Is housing improvement a potential health improvement strategy? Geneva, Switzerland: WHO Regional Office for Europe's Health Evidence Network; February 2005.
3. Les accidents de la vie courante. Caisse nationale d'assurance maladie des travailleurs salariés. *Actualités Statistiques*, Point Stat number 41, April 2005.

Available online February 7, 2006.
doi:10.1016/j.jaci.2005.11.044

Reply

To the Editor:

Our original study published in the *New England Journal of Medicine* was designed to evaluate an intervention to reduce the environmental risks associated with asthma.¹ We addressed some of the other risks associated with asthma in previous publications.^{2,3} The current study was an economic evaluation of the environmental intervention. As mentioned in our paper, other benefits may accrue from the intervention, such as the effect of reducing environmental risk factors on other household members with asthma. Dr Charpin⁴ is correct that children face many risks in the indoor environment that are unrelated

to asthma. He suggests that one could use home visitors to reduce these risk factors that affect the health of children. Depending on the time and resources required to expand the intervention to target these problems, we agree that spreading the fixed cost portion of the home visit over other targets would likely improve the cost-effectiveness or increase the likelihood of cost-savings from home interventions.

Meyer Kattan, MD^a

Sally Stearns, PhD^b

Ellen Crain, MD^c

Cindy Visness, MA, MPH^d

Herman Mitchell, PhD^d

For the Inner-City Asthma Study

From the ^aMount Sinai School of Medicine, Department of Pediatrics, One Gustave L. Levy Place, Box 1202B, New York, NY 10029-6504; ^bDepartment of Health Policy and Administration, University of North Carolina at Chapel Hill, Chapel Hill, NC; ^cDepartment of Pediatrics, Albert Einstein College of Medicine, Bronx, NY; and ^dRho, Inc., Chapel Hill, NC.

Disclosure of potential conflict of interest: No Conflict of Interest disclosure statement was received from H. Mitchell. The rest of the authors have declared they have no conflict of interest.

REFERENCES

1. Morgan WJ, Crain EF, Gruchalla RS, O'Connor GT, Kattan M, Evans RE, et al. Results of a home-based environmental intervention in urban children with asthma—the Inner City Asthma Study. *N Engl J Med* 2004; 351:1068-80.
2. Kattan M, Mitchell H, Eggleston P, Gergen P, Crain E, Redline S, et al. Characteristics of inner city children with asthma: the National Cooperative Inner City Asthma Study. *Pediatr Pulmonol* 1997;24:253-62.
3. Evans R, Gergen P, Mitchell H, Kattan M, Kerckmar C, Crain E, et al. A randomized trial to reduce asthma morbidity among inner-city children: results of the Inner-City Asthma Study. *J Pediatr* 1999;135: 332-8.
4. Charpin DA. Cost-effectiveness of home-based interventions should also take into account nonrespiratory indoor health hazards. *J Allergy Clin Immunol* 2006;117:953.

Available online February 20, 2006.
doi:10.1016/j.jaci.2005.11.043

Nutritional supplements and pediatric upper respiratory tract illnesses

To the Editor:

The recent review by Drs Devereux and Seaton¹ is an excellent synthesis of the facts and issues regarding diet as a risk factor for atopy and asthma. Upper respiratory tract illnesses are a frequent cause of asthmatic exacerbations, and many children with asthma have sinusitis. Our research concerns the use of flavored cod liver oil and a multivitamin-mineral with selenium to decrease upper respiratory tract infections, including sinusitis, in young children.²⁻⁵ On the basis of encouraging pilot work,² but lacking a matched placebo for liquid cod liver oil, we performed a larger study using 2 randomized pediatric sites⁴; there were 47 children at each site, with an average age of 2 years. The supplementation group had a steady and statistically significant decrease in the mean number of

upper respiratory tract pediatric visits per month during the winter and early spring, whereas the comparison group had no change in this parameter.⁴ In other pilot work,³ these supplements improved symptoms and decreased doctor visits in 3 of 4 older children with chronic/recurrent sinusitis; 1 of the responders was a child with asthma.

Cod liver oil contains n-3 polyunsaturated fatty acids as well as vitamins A and D; the multivitamin-mineral supplement we used contains vitamins C and E and selenium. Devereux and Seaton¹ report that retinoids, vitamins C and E, selenium, and n-3 polyunsaturated fatty acids may have a role in asthma, on the basis of epidemiological work. However, they also note that most asthma intervention studies, which usually evaluate only 1 or 2 constituents, have not demonstrated a clear benefit. Perhaps our use of a cocktail of supplements has contributed to the efficacy we have noted to date for upper respiratory tract illnesses. Use of these supplements as adjunctive therapy for children with asthma might be clinically useful, and further investigation of this approach appears warranted.

Linda A. Lindsay, MD

From the Department of Pediatrics, St Luke's-Roosevelt Hospital Center; Department of Otolaryngology, New York Eye and Ear Infirmary; and the College of Physicians and Surgeons. Author address: 340 West 55th Street, Suite 9A, New York, NY 10019-3752.

Supported in part by the Department of Otolaryngology of the New York Eye and Ear Infirmary (New York, NY). J. R. Carlson Laboratories (Arlington Heights, Ill) donated the nutritional supplements used in this research but had no other role in the design or conduct of the studies.

Disclosure of potential conflict of interest: The author has received small financial commissions for the sale of books and supplements purchased by visitors who access product links posted on her Web site.

REFERENCES

- Devereux G, Seaton A. Diet as a risk factor for atopy and asthma. *J Allergy Clin Immunol* 2005;115:1109-17.
- Lindsay LA, Dolitsky JN, Shindeldecker RD, Pippenger CE. Lemon-flavored cod liver oil and a multivitamin-mineral supplement for the secondary prevention of otitis media in young children: pilot research. *Ann Otol Rhinol Laryngol* 2002;111:642-52.
- Lindsay LA, Dolitsky JN, Shindeldecker RD. Nutritional supplements as adjunctive therapy for children with chronic/recurrent sinusitis: pilot research. *Int J Pediatr Otorhinolaryngol* 2004;68:785-93.
- Lindsay LA, Shindeldecker RD, Tapia-Mendoza J, Dolitsky JN. Effect of daily cod liver oil and a multivitamin-mineral supplement with selenium on upper respiratory tract pediatric visits by young, inner-city, Latino children: randomized pediatric sites. *Ann Otol Rhinol Laryngol* 2004;113:891-901.
- Lindsay LA. Nutritional supplements and upper respiratory tract illnesses in young children living in the United States. In: Bendich A, Deckelbaum RJ, editors. *Preventive nutrition: the comprehensive guide for health professionals*. 3rd ed. Totowa (NJ): Humana Press Inc; 2005. p. 521-49.

Available online February 7, 2006.
doi:10.1016/j.jaci.2005.12.1332

Reply

To the Editor:

Dr Lindsay's¹ correspondence on the beneficial effects of zsupplementation with cod liver oil and a multivitamin-

mineral preparation on the frequency of pediatric upper respiratory tract illnesses highlights several important issues regarding diet as a risk factor for atopy and asthma.² Most intervention studies of dietary supplementation have focused on adults with (or mouse models of) atopy or asthma; thus, there is an obvious paucity of intervention studies in children. As outlined in the recent article in this journal,² dietary intervention during early life, when the airways and T_H cell responses to allergens are maturing, have the potential to be more effective than intervention in adults; Dr Lindsay's¹ correspondence is consistent with this suggestion.

The majority of studies relating diet to asthma and atopic disease report associations with individual nutrients. Several investigators in the field have eloquently argued that this is an artificial oversimplification, suggesting instead that studies of individual foods are more appropriate. The food we eat contains numerous nutrients, many of which could influence the development of atopy and asthma, such as polyunsaturated fatty acids (PUFA), antioxidants, vitamin D, and trace elements. Furthermore, foods rich in one antioxidant tend to be rich in others, many of which may not be quantifiable by current food frequency questionnaires. Thus it is possible that reported associations with single nutrients may be the result of confounding by other nutrients. In addition, there are complex interactions between nutrients such as PUFA, vitamin E, and vitamin C³ that are particularly pertinent and suggest that the antioxidant and lipid/fatty acid hypotheses could be different ends of the same stick. In light of these considerations, intervention studies that have supplemented with individual nutrients may have been ineffective because of the absence of confounding nutrients and/or the absence of other nutrients required for maximum biological effectiveness of the study nutrient. In light of the generally disappointing results of intervention with single or 2 to 3 nutrients in adults with established asthma, perhaps intervention studies with individual foods or complex mixtures of PUFAs, antioxidants, and minerals in young children to prevent and/or ameliorate asthma/atopy should be conducted.

Graham Devereux, MD

Anthony Seaton, MD

From the University of Aberdeen, Department of Environmental and Occupational Medicine, Foresterhill, Aberdeen AB25 2ZP, United Kingdom.

Disclosure of potential conflict of interest: The authors have declared they have no conflict of interest.

REFERENCES

- Lindsay LA. Nutritional supplements and pediatric upper respiratory tract illnesses. *J Allergy Clin Immunol* 2006;117:953-4.
- Devereux G, Seaton A. Diet as a risk factor for atopy and asthma. *J Allergy Clin Immunol* 2005;115:1109-17.
- Scarpa M, Rigo A, Maiorino M, Ursini F, Gregolin C. Formation of alpha-tocopherol radical and recycling for alpha-tocopherol by ascorbate during peroxidation of phosphatidylcholine liposomes: an electronic paramagnetic resonance study. *Biochim Biophys Acta* 1984;801:215-9.

Available online February 7, 2006.
doi:10.1016/j.jaci.2005.12.1333