

Correspondence

Clinic record review of pediatric asthmatic patients after September 11, 2001, does not support authors' conclusions

To the Editor:

Szema et al¹ imply that pediatric asthmatic patients living within 5 miles of the World Trade Center (WTC) site had an increase in asthma severity related to substances released from the September 11, 2001, attacks on the WTC. Important limitations of their study population, outcome measures, and statistical analyses raise serious doubts about their conclusions.

The authors reviewed clinic records at a single clinic in Chinatown, in lower Manhattan, to identify children who had at least 1 clinic visit for asthma in the 12 months before and the 12 months after 9/11. Children living in zip codes less than 5 miles from the WTC site (region 1) had a significant increase ($P = .015$) in asthma visits after 9/11, whereas the increase in visits among those living more than 5 miles from the WTC (region 2) was "not significant" ($P = .06$). Region 1 children live closer to the study clinic, and it should not be surprising that, all else being equal, they would be more likely to return there regularly for care. In addition, the authors do not distinguish routine and unscheduled visits in their analysis, and therefore it is not clear whether the increase in visits reflects better care or "clinical deterioration."

Although the authors collected repeated measures of asthma for the same individuals, the statistical analyses presented are not appropriate for such data. For example, both groups of children had increases in clinic visits from the pre-9/11 to the post-9/11 periods. Although the increase in region 1 children was greater (29%) than that in region 2 children (19%), comparing the P values for the increases is not an appropriate test of whether the increases in visits differed significantly between the groups. A repeated-measures analysis would almost certainly show that they did not. The peak flow data analysis is similarly flawed. The peak flow data across the 3 pre-9/11 quarters suggests a higher mean peak flow in region 2 children. A repeated-measures analysis would likely show no significant difference between region 1 and region 2 children in the change in mean peak flow from before 9/11 to after 9/11.

The data presented on asthma medications has the same limitations in terms of statistical analysis and raises further questions. Region 2 children had nearly twice the number of rescue inhaler doses at baseline, suggesting significant differences between the groups in pre-9/11 management, severity, or both. Oral steroid use, presumably a marker of severe asthma exacerbations, was similar and decreased by a slight but similar amount in both groups.

Finally, for virtually every analysis, the authors present neither data on the number of children contributing data on a given measure in a given time period nor a comparison with children with missing data. This precludes assessment of potential selection bias.

Although scientific questions remain about the long-term health effects of the September 11, 2001, attacks on the WTC, the conclusion of Szema et al,¹ that "Residential proximity to Ground Zero was predictive of the decrease in asthma health," is unsupported by the data presented.

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Reply

To the Editors:

We thank Drs Matte and Mostashari¹ for their interest, questions, and criticism of our article.² Their letter is concerned mainly with the statistical interpretation of our data, and we are pleased to provide at least some of the answers here.

Regarding the questions posed, the authors write that "region 1 children live closer to the study clinic, and it should not be surprising that, all else being equal, they would be more likely to return there regularly for care." The "no-show rate" for the clinic at the Charles B. Wang Community Health Center between September 1, 2000, and August 31, 2001, was 11.95% for all pediatric patients. Specifically, for children within 5 miles, it was 13.06%, and for those living farther away, it was 10.98%. Thereafter, from September 11, 2001, to December 31, 2001, the no-show rate was 15.21% for all patients, 16.37% for children within 5 miles, and 14.51% for those living farther away. Therefore, children living farther away kept more of their appointments. In this mainly first-generation immigrant population, strong cultural traditions led to a low no-show rate.

"The authors do not distinguish routine and unscheduled visits in their analysis, and therefore it is not clear whether the increase in visits reflects better care or 'clinical deterioration.'" We excluded routine general pediatrician visits and only included visits for asthma care. All patients had a primary care general pediatrician who followed assigned children longitudinally. All general pediatricians, as well as the pediatric allergist who examined all patients, consistently followed the National Institutes of Health National Asthma Education and Prevention Program asthma treatment guidelines. All physicians were blinded to the zip code addresses of these children.

Other studies provide support for our hypothesis that asthma attacks increased. In the *Morbidity and Mortality Weekly Report*, a telephone survey 5 to 9 weeks after 9/11 determined that 13% of respondents had asthma. Twenty-seven percent of these persons had increased severe asthma after 9/11. Although seasonal increases in asthma attacks were expected, the increased severity was also associated with self-reported (1) psychological stress and (2) cough and dyspnea temporally associated with exposure to dust fumes.³

“Comparing the *P* values for the increases in visits differed significantly between the groups. A repeated-measures analysis would almost certainly show that they did not.”¹ We did conduct a repeated-measures ANOVA by using the Statistical Package for the Social Sciences (SPSS), and this analysis indicated that the rates of increases in visits differed significantly between the groups. Although the effect of location (region) was not significant, there was a significant interaction of location over time (*P* < .05), suggesting differential rates of changes in asthma visits over time in the 2 regions.

“A repeated-measures analysis would likely show no significant difference between region 1 and region 2 children in the change in mean peak flow from before to after 9/11.”¹ We did conduct a repeated-measures ANOVA with SPSS to analyze data collected for the third and fourth quarters of 2001. This analysis confirmed that the post-9/11 decrease in the percentage peak flow rate for region 1 was close to that of region 2 (*P* = .06).

“Region 2 children had nearly twice the number (of) rescue inhaler doses at baseline, suggesting significant differences between the groups in pre-9/11 management, severity, or both.”¹ Data regarding rescue inhaler doses were limited and therefore highly positively skewed; therefore no meaningful conclusions can be inferred from these results.

“Oral steroid use, presumably a marker of severe asthma exacerbations, was similar and decreased by a slight but similar amount in both groups.”¹ We agree that oral steroid use data were limited, and therefore no meaningful conclusions can be inferred from these results.

“For virtually every analysis, the authors present neither data on the number of children contributing data on a given measure in a given time period nor a comparison with children with missing data. This precludes assessment of potential selection bias.” The selection bias caused by missing data is a legitimate concern for any study. More than 80% to 95% of children had their height and weight measured. About 75% to 82% of the sample contributed to the quarterly data of the predicted peak expiratory flow rate values. About 88% to 94% of participants contributed to all clinical parameters (see Table II and III of the original article), except for the “rescue inhaler doses,” which was measured only in 65% of the participants. We also examined the demographic characteristics of those patients included in the study and those patients who had missing data on a few key measures and found that those with missing data were quite comparable with the final sample included in the reported analysis. (*P* values ranging from .48 to .62).

We appreciate the opportunity to provide answers and clarifications.

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Significance of the eudismic ratio and enantiomeric purity of the albuterol distomer

To the Editor:

I found the results about the opposite pharmacological effects of albuterol enantiomers on the contractility of the human bronchial smooth muscle obtained by Agrawal et al¹ very interesting, but I think that the controversy surrounding this issue is headed in the wrong direction.

Going back to the basics, the interaction between the enantiomers of a chiral drug and the β_2 -receptor takes place according to the 3-point contact model. This means that, although the eutomer has an effective pharmacological action because it can connect to the receptor at 3 active sites simultaneously, the distomer still is able to connect to an active site, and it may have weak or very weak pharmacological activity.

The affinity ratio between the eutomer and the distomer, as described by Lehmann et al,² is known as the eudismic