"Asthma in New York's Chinatown After 9/11"

Anthony M. Szema, M.D., Assistant Professor of Medicine and Surgery, SUNY Stony Brook School of Medicine, Chief, Allergy Section, Veterans Affairs Medical Center, Northport, NY

We had been following children with asthma in the largest ethnically homogeneous neighborhood proximal to the World Trade Center, since 1997. After September 11, 2001, serendipity presented us with a control population to study pre- and post- the World Trade Center disaster.

HYPOTHESES

We had 2 hypotheses: 1) Pediatric asthma patients exposed to the World Trade Center (WTC) disaster may experience increased asthma severity. 2) Some previously healthy children may be newly diagnosed with asthma after September 11, 2001.

STUDY POPULATION

The Study Population comprised Chinese-American pediatric asthmatic patients who live in New York City. They all receive medical care at the Charles B. Wang Community Health Center (CBWCHC), 1.5 miles from the WTC. The closest border of Chinatown to Ground Zero is three blocks.

METHODS & DATA COLLECTION

Eligible subjects included patients younger than 18 years of age (as of September 11, 2001) who had established asthma and enrolled in an asthma registry by Dr. Deborah H. Lin, Chief, Allergy, at the CBWCHC, prior to 9/11. All patients included in the study were given a diagnosis of asthma by Dr. Lin, who is a pediatric allergist.

Patients younger than 6 years were given a diagnosis of asthma if they had: 2 or more episodes of wheezing or coughing within a 12 month period, and symptoms improved after asthma medication in the clinic.

Children older than 6 years were given a diagnosis of asthma if they had: wheezing, cough, or dyspnea on at least 2 occasions, and symptoms and physical signs and peak flow rates improved after bronchodilator therapy. We only included subjects who had: 1) At least one clinic visit for asthma between September 11, 2000 and September 10, 2001. 2) At least one clinic visit between September 11, 2001 and September 10, 2002.

This was a retrospective chart review. 205 pediatric patients with established asthma from the clinic were studied. Clinical data were obtained for the 12 months before and after September 11, 2001.

Seven physicians trained in internal medicine or pediatrics reviewed 319 patient charts from the asthma registry. Two hundred and five patients met the inclusion criteria which required them to have at least 9 of 10 variables studied.

We studied the number of visits to the M.D. for asthma, number of asthma medication prescriptions, use of oral corticosteroids, number of weekly doses of rescue inhaler, peak expiratory flow rates measured in liters per minute as air leaves the lung—a low number means an asthma attack, age, height and weight 3 months pre- and post- 9/11, and sex.

Doctors were blinded to the residential zip code. For peak expiratory flow rates (PEFR), the best value of 3 trials was recorded at each visit. PEFRs were obtained from all patients who were able to consistently perform the maneuver.

Demographic characteristics of Chinese-American patients were as follows: average age 8 years, 34% female, 66% male, height 48 inches and weight 63 pounds. We further characterized patients as those living within 5 miles of the World Trade Center and those living further away.

As you can see from the next two tables, these groups were appropriately matched. There was no statistical difference between the two groups with regard to age, sex, height and weight.

RESULTS

The number of clinic visits for children with asthma increased from 3.79 visits in the twelve months prior to 9/11 to 4.69 visits in the twelve months after 9/11. The number of asthma prescriptions per child increased from 2 to 2.3 during the same time period. The number of rescue inhaler doses per week and oral steroid usage did not differ.

In this map we can see Ground Zero to the left. In red are those zip codes of residence of our kids with asthma who lived within 5 miles of the World Trade Center. In blue are those zip codes from those asthmatic children who lived greater than 5 miles away.

The number of clinic visits for children in region 1 (within 5 miles) increased after 9/11 along with the number of asthma prescriptions. There were no differences in the number of rescue inhaler doses or oral steroid use.

In region 2 (greater than 5 miles), although the average number of clinic visits and asthma prescriptions increased after 9/11, these increases were not statistically significant.

For the entire clinic population, we tracked the number of children with a diagnosis of asthma. ***The number of children with asthma increased 66% and pediatric asthma visits increased 48.8%.***

As we can see in the bar chart, there was an increase in pediatric asthma patients in Chinatown from 306 to 510. The number of pediatric asthma visits increased from 1044 to 1544.

In comparison, a control group of children with asthma treated in Flushing, Queens, 11.9 miles from Ground Zero, by the same physicians in Manhattan, using the same practice standards, showed children with asthma decreased 10.9% and the number of pediatric asthma visits decreased 13.6%.

Mean percent predicted peak flow rates decreased below 80% of predicted in children living within 5 miles from Ground Zero. The decrease lasted for 6 months.

SUMMARY

- In summary, ***exposure to the World Trade Center disaster led to increased asthma severity. Children living within 5 miles of ground Zero had more asthma clinic visits after September 11, 2001***.

- ***These children received more prescriptions for asthma medications***. The increase in visits for asthmatic children living further than 5 miles from Ground Zero was not significant. ***Mean percent predicted peak expiratory flow rates decreased solely for those patients living within 5 miles of ground zero after September 11, 2001.***

CONCLUSION

- In conclusion, ***asthma severity worsened after September 11, 2001, in pediatric asthmatic patients living near Ground Zero***.

- ***Residential proximity to Ground Zero was predictive of the degree of decrease in asthma health.***

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