

Why are kids in asthma hotspots in NYC more likely to visit the ER? Exercise may be a factor

December 17 2012

Asthmatic children in New York City neighborhoods with high rates of asthma make many more visits to the emergency room (ER) than those who live in other parts of the city. While socioeconomic factors such as lack of adequate preventive care are part of the equation (high-asthma neighborhoods tend to be lower income), new research points to a possible biological basis for the disparity. Asthmatic children living in asthma hotspots were twice as likely to experience a common symptom known as exercise-induced wheeze than were those in neighborhoods with lower asthma rates.

Results by researchers at Columbia University Medical Center and Dartmouth-Hitchcock Medical Center appear online in *Pediatrics*, the journal of the American Academy of Pediatrics.

The study enrolled 195 middle-income children with asthma, ages 7 and 8, living throughout New York City—in areas with varying [asthma prevalence](#). The children were given a [clinical evaluation](#), and their caregivers completed a [health survey](#) that included whether they had experienced exercise-induced wheeze one or more times in the past year.

Overall, 43% of the children had experienced exercise-induced wheeze. Those living in asthma hotspots were twice as likely to have experienced symptoms after exercise and more likely to have visited their doctor in a hurry or an ER because of [breathing problems](#), even after adjusting for

neighborhood, income, and other factors.

"Exercise-induced wheeze is very uncomfortable for children. It can present rapidly after beginning any strenuous activity and lead quickly to [respiratory symptoms](#), so it is not surprising that it is a factor in ER visits," said lead author Timothy Mainardi, MD, past fellow at Columbia University Medical Center and currently in practice at Hudson Allergy.

Dr. Mainardi and his colleagues found that one-third of the children experiencing exercise-induced wheeze had not used an [inhaler](#) prior to exercising. "The good news," he said, "is that these symptoms are preventable. Parents should talk with their doctor so they can be ready with a plan, including the use of appropriate medication such as a bronchodilator inhaler prior to exercise."

Addressing neighborhood disparities in asthma-related ER visits has been a public health priority for many years. A 2002 report by the New York City Department of Health and Mental Hygiene found that ER visits for asthma were up to 20 times more common in low-income neighborhoods than elsewhere. Since then, asthma-related ER visits have declined, although a gap between higher and lower income neighborhoods remains.

To help explain these differences, the Columbia researchers first looked to see if asthma was more severe in low-income, high-asthma neighborhoods. It was not. "Lung function, airway inflammation, allergy to common asthma triggers, and symptom frequency were similar no matter where the child lived," said senior author Matthew Perzanowski, PhD, associate professor of environmental health sciences at Columbia's Mailman School of Public Health. By process of elimination, the researchers focused on one particular manifestation of the disease: rapid airway constriction brought on by exercise.

Exactly why asthma hotspots have higher rates of this symptom remains a mystery. While inadequate use of a bronchodilator inhaler prior to exercise was part of the story, it didn't fully explain the findings.

Allergens and air pollution related to fossil fuel burning were not found to be factors. Neither were differences in physical activity, obesity, or neighborhood conditions such as the number of parks.

"Exercise-induced symptoms," said Dr. Perzanowski, "may identify a distinct population of asthmatics with causes for their exacerbations yet to be determined. The important lesson is that with greater awareness and treatment, we can hope to prevent those unscheduled visits to the doctor and trips to the ER."

Provided by Columbia University's Mailman School of Public Health

Citation: Why are kids in asthma hotspots in NYC more likely to visit the ER? Exercise may be a factor (2012, December 17) retrieved 24 April 2024 from

<https://medicalxpress.com/news/2012-12-kids-asthma-hotspots-nyc-er.html>

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