Respiratory Infections, Not Air Pollution, Pose Winter Health Threat for Asthmatics

DECEMBER 03, 2012

DENVER — Although particulate air pollution has been blamed for a wide variety of negative health effects, a three-year study of asthmatic children in Denver, published in the November Journal of Allergy and Clinical Immunology, indicates that it does not lead to significant worsening of asthma during the pollution-heavy winter months. Upper respiratory infections, however, were associated with a significant decline in lung function, asthma symptoms and asthma exacerbations.

"In our study, wintertime air pollution had no significant effect on asthma exacerbations or lung function," said Nathan Rabinovitch, MD, a lead author of the study and pediatric allergist at National Jewish Medical and Research Center. "Upper respiratory infections, however, doubled the chances that a child would suffer an asthma exacerbation and more than quadrupled the odds that a child would suffer asthma symptoms."

The study monitored 41, 63 and 43 elementary school children during three successive winters in Denver, Colorado, when particulate pollution is worst. The children, aged 6 to 12 years, were mostly urban minority children with moderate to severe asthma. Dr. Rabinovitch and co-investigator Erwin Gelfand, MD, Chairman of Pediatrics at National Jewish, monitored several health outcomes in the children, including asthma exacerbations, visits to emergency rooms and hospitalizations. They also monitored the children's lung function, medication use, asthma symptoms, and whether they had upper respiratory infections.

The researchers correlated those health measures with daily variations in six air pollutants: particulates less than 10 microns in diameter, particulates less than 2.5 microns diameter, carbon monoxide, nitrogen dioxide, sulfur dioxide and ozone. In general pollutants were comparable to levels found in most large American cities.

As expected, the raw data did show worse health associated with high pollution days. But when the researchers controlled for potential time-related confounders, such as upper respiratory infections, the correlation disappeared on almost all measures. Higher carbon monoxide levels were marginally associated with increased use of rescue medications (odds ratio: 1.065) and daily symptoms were marginally associated with ozone levels (odds ratio: 1.083).

"It is well known that upper respiratory infections can cause problems for people with asthma, but the air pollutions results were a surprise," said Dr. Gelfand. "We believe that careful monitoring of the children allowed us to filter out confounding factors that would have mistakenly suggested a significant health impact of air pollution."

The researchers are not ready to write off the effects of air pollution during summer. For one, children may be exposed to higher levels of air pollution in the summer because they spend more time outside. Also, ozone, a known respiratory irritant, rises to much higher levels during the summer and may pose more of a problem than particulate pollution in the winter. Next summer Drs. Rabinovitch and Gelfand will begin a study of the health impacts of ozone on children with asthma.

"We believe this is good news for parents of children with asthma," said Rabinovitch. "Instead of worrying about air pollution they can focus their efforts on preventing and treating the real wintertime threat to their children's health - colds and other respiratory infections."

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