Pollution takes its toll on the heart

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The fine particles of pollution that hang in the air can increase the risk for sudden cardiac arrest, according to a new study conducted by a team from Long Island Jewish (LIJ) Medical Center and The Feinstein Institute for Medical Research.

Robert A. Silverman, MD, and his colleagues have been interested in the effects of ambient fine particulate matter on a number of medical conditions, including cardiovascular disease and asthma. The US Environmental Protection Agency (EPA) keeps tabs on air pollution through dozens of strategically placed pollution sensors in cities and towns throughout the country. This data allowed the researchers to collect data on average 24-hour values of small particulates and other gaseous pollutants around New York City during the summer (when pollution is higher) and winter months. They then compared that data to the 8,216 out-of-hospital cardiac arrests that occurred between 2002 and 2006. Most people in the throes of a cardiac arrest do not survive in time for emergency medical service teams to save them.

What they were looking for was simple: Were there more cardiac arrests on high pollution days than on lower pollution days? In the American Journal of Epidemiology, Dr. Silverman and his fellow researchers reported that for a 10ug/m^3 rise in small particle air pollution, there was a four-to-10 percent increase in the number of out-of-hospital cardiac arrests. The current EPA standard is 35ug/m^3. The effect was much greater in the summer months, said Dr. Silverman, an associate professor of emergency medicine and director of research at LIJ's Department of Emergency Medicine. The scientists also evaluated levels of ozone, nitric

oxide, sulfur dioxide and carbon monoxide, but these showed a much weaker relationship. Analysis of the data from the death records and the 33 EPA monitors was conducted in collaboration with Kazuhiko Ito, PhD, an assistant professor at the Nelson Institute of Environmental Medicine at New York University School of Medicine and investigators from the New York City Fire Department, John Freese, MD, Brad J. Kaufman, MD, David J. Prezant, MD, and James Braun.

"Small particulate matter is dangerous to health," said Dr. Silverman. "We need to figure out ways to combat air pollution and decrease the number of high-pollution days." He added that pollution related cardiac arrests occurred during times when the levels were high but still below the current EPA safety threshold.

The researchers are now looking for a relationship between out-of-hospital cardiac arrests and traffic flow patterns. Other studies have suggested that one in three people live in areas where small particulate matter levels are considered unhealthy.

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