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Air pollution exposure may have direct role in triggering lupus among children and adolescents

Published on June 10, 2016 at 7:03 AM

The results of a study presented today at the European League Against Rheumatism Annual Congress (EULAR 2016) show for the first time that an individual's exposure to air pollution may have a direct role in triggering disease activity as well as airway inflammation in children and adolescents with Systemic Lupus Erythematosus (SLE). This study, conducted in Brazil, has confirmed a direct link between an individual's personal exposure to fine pollution particles and their lupus disease activity.

Previous studies have shown that exposure of a population to outdoor pollutants was associated with an increase in hospital admissions due to paediatric rheumatic diseases, as well as a higher risk of disease activity in those patients attending a hospital with childhood-onset SLE.

Air pollution is a major health issue in Brazil, killing around 49,000 Brazilians every year as a result of its direct link to respiratory and cardiovascular disease, and cancer. Deaths from both outdoor and indoor air pollution represent one in every 26 deaths from all causes in Brazil, making it the ninth largest mortality risk in the country. The WHO has estimated that one in eight of total deaths globally are the result of air pollution exposure, confirming air pollution as the world's largest single environmental health risk. Air pollution is estimated to cause nearly half a million premature deaths each year in the European Union. In busy cities, where air quality is usually at its worst, the average life expectancy of people is reduced by over two years.

"Our findings have shown that air pollution doesn't just increase the incidence and prevalence of chronic lung disease and acute respiratory infections, lung cancer, heart disease and strokes, it is also an important contributory factor in childhood rheumatic diseases, such as lupus," said Dr Maria Fernanda Goulart from the Department of Paediatric Rheumatology, University of São Paulo, Brazil. "With air pollution increasing in many major cities, paediatric rheumatologists can expect to see a resultant impact on the disease activity of their lupus patients," she added.

Using a standard measure of moderate to severe lupus disease activity (SLEDAI-2K ≥ 8), an increase of 18.12 $\mu\text{g}/\text{m}^3$ in the daily concentration of the most dangerous of the airborne pollution particles PM_{2.5} was associated with a significant increase in lupus activity at four and 11 days after exposure. This increase in disease severity may be reflected in worsening of a variety of laboratory findings, mainly renal (proteinuria, haematuria, leukocyturia) and haematological (thrombocytopenia and leukopenia) involvement.

Measurement of two biomarkers after exposure to an increase in PM_{2.5} showed a significant acidification of exhaled breath condensate at days seven and 10, and an increase in fractional concentration of exhaled nitric oxide, both of which suggest a significant increase in airway inflammation related to air pollution. Despite this worsening airway inflammation, children and adolescents with SLE didn't present any evidence of an increase in acute respiratory symptoms.

Source:

European League Against Rheumatism
