Exploring the neurological impact of air pollution

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Air pollution has become a fact of modern life, with a majority of the global population facing chronic exposure. Although the impact of inhaling polluted air on the lungs is well known, scientists are just now beginning to understand how it affects the brain. A new article in

Chemical & Engineering News, the weekly newsmagazine of the American Chemical Society, details how researchers are connecting air pollution to dementia, autism and other neurological diseases.

Arising from vehicle emissions, power plants and factories, air pollution is a complex soup of gases, metals, organic contaminants and other materials. Over 90% of the world's population is continually exposed to particulate matter (PM) pollution, which is known to penetrate deep into the lungs, at levels above the World Health Organization's guidelines, writes Contributing Editor Janet Pelley. Inhaling these substances causes inflammation, which is the body's healthy response to injury or infection, but over time chronic inflammation can damage healthy tissues.

Although the correlation between PM and lung damage is clear, scientists believe that these harmful particles can also impact the brain, either directly or indirectly. In a recent study, infant mice exposed to air pollution showed altered social behaviors similar to those of autistic children. Postmortem observations revealed inflammation and other abnormalities in the mice's brains resembling changes seen in children with autism. Researchers suspect that iron particles in PM could play a role, as they are known to cause cell death in Parkinson's and Alzheimer's diseases. In mice, inflammation caused by breathing polluted air also appears to boost the production of amyloid plaques, the sticky protein fragments associated with neurological diseases like Alzheimer's. While evidence is mounting that air pollution can pose a serious threat to brain health, scientists emphasize that their research must coincide with policy changes to reduce pollution worldwide.

More information: "How Air Pollution Messes With Our Minds," cen.acs.org/biological-chemist … -messes-minds/98/i21

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