

## Science

***Environmental Pollution in Disease***

**“During toxic exposures, inflammation and oxidative stress plays a pivotal role in tissue injury and disease .”**

Environmental pollution has become ubiquitous. Modern people have run to all corners of the earth seeking fresh, clean air and few have found it.

Air pollution comes in the forms of industrial emissions, cigarettes, pesticide applications, fragrances in personal care products, air ‘fresheners’, laundry products, and cleaning chemicals.

All of these sources of pollution expose people to toxic compounds. During toxic exposures, inflammation and oxidative stress plays a pivotal role in tissue injury and disease according to researchers.

Roberts and colleagues say, “The associated oxidative and nitrative stress promote neurodegenerative disorders, atherosclerosis, chronic inflammation, cancer, and premature labor and still-birth.”

Sustained inflammation has been linked to chronic fatigue syndrome, fibromyalgia, lupus, chemical sensitivity, and various autoimmune disorders. It also provides a perfect environment for the growth of malignant tumors.

Genes involved in regulating oxidative stress may be altered by anesthetics, leading to brain injury upon exposure to environmental pollutants. The effects of oxidative stress on the brain are particularly strong during a child’s developmental stages.

Besides tissue injury in the brain, Roberts says that, “inflammation and oxidative stress are implicated in Parkinson’s

disease, a neurodegenerative disease characterized by the loss of dopamine neurons.”

Dopamine, a neurotransmitter in the brain, is a precursor to adrenaline and is essential to the normal function of the central nervous system, attention, cognition, movement balance, immune function, insulin release, energy, and pleasure.

People with chronic fatigue syndrome and fibromyalgia generally have lower dopamine levels than their healthy counterparts. This may be the result of environmental exposures.

Some people are more susceptible to environmental exposures than others; one person may be adversely affected, while another does not appear to be affected or is affected in a different way. One person may develop cancer, for example, while another gets fibromyalgia from the same exposure.

Susceptibility to environmental exposures varies from person to person and is largely dependent on the liver’s ability to break down and eliminate toxic matter. People who metabolize toxics more slowly are affected to a greater extent.

**Reference**

Roberts RA, Laskin DL, Smith CV, Robertson FM, Allen EM, Doorn JA, Slikker W. Nitrative and Oxidative Stress in Toxicology and Disease. *Toxicol Sci.* 2009 Aug 5. [Epub ahead of print]

