

Multiple Health Risks from Fossil Fuel Combustion: The Impacts of Air Pollution and Climate Change on Children

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INTRODUCTION

Fossil fuel combustion, like the many-headed Hydra of Greek mythology, causes several of the serious health and developmental problems in children by emitting poisonous particles and gases, as well as carbon dioxide (CO₂), a co-pollutant that is a key driver of climate change [1].

We would gain considerable benefits for children if we, like Herakles, succeeded in slaying the Hydra, including fewer incidences of preterm births, low birth weight, cognitive and behavioural impairments, and asthma and other respiratory illnesses. All of these things have been connected to hazardous air pollution, as well as reduced heat-related illnesses, hunger, infectious disease, physical trauma, mental illness, and respiratory illness as a result of climate change. Because exposure-related injury, sickness, or disability in early life can affect health over the course of a person's life and even across generations, the advantages would be immediate and long-lasting [2].

Why the Focus on Early Windows of Development?

The developing foetus and young child are more biologically and psychologically vulnerable to the many negative effects of toxic air pollutants, physical trauma, psychosocial stress, nutritional deprivation, infectious agents, and heatwaves associated with climate change caused by fossil fuel combustion than adults. Children's rapid growth, dynamic developmental programming sensitive to dysregulation, underdeveloped detoxification, immunological, and thermoregulatory systems, and their reliance on adult caregivers are all contributing factors. The brain's 86 billion neurons are generated during the perinatal period, and the brain, lungs, and immune system continue to develop during infancy until age 6 and beyond, demonstrating the need of protection during these early developmental windows.

Children are exposed to more hazardous air pollutants than adults, in addition to their heightened developmental sensitivity. Recent research has shown that the foetal period and early infancy are vulnerable periods for genetic damage and epigenetic dysregulation

caused by xenobiotics and stress, with lifetime and transgenerational repercussions [3].

Health and Developmental Impacts of Air Toxics

The primary cause of air pollution is the combustion of fossil fuels (coal, diesel fuel, gasoline, oil, and natural gas) for electricity generation, heating, transportation, and industry. According to the World Health Organization, air pollution is the most serious environmental health threat. In 2012, ambient air pollution caused 3.7 million deaths, while home air pollution caused 4.3 million deaths due to indoor use of solid fuels (wood, charcoal, coal, crop wastes, and dung) for cooking and heating. Early-life exposures to traffic-related pollutants, PM_{2.5}, PAH's, and O₃ have been linked to a variety of impacts on the developing foetus and child, some of which can have long-term health implications [4].

Adverse Birth Outcomes

Low or reduced birth weight, small size for gestational age (SGA), and preterm delivery are all linked to air pollution exposure. Black women who were exposed to particulate pollution had the highest risk of all morbidity outcomes, especially very low birth weight. In one of only a handful of exceptional "normal examinations" following the medical advantages of decreasing air contamination, during the period when the Utah Valley Steel Mill shut down (August 1986–September 1987), particulate air contamination levels (estimated as PM₁₀; PM ≤ 10 μm) were diminished essentially, and mothers who were pregnant around the hour of the conclusion of the factory were less inclined to convey rashly than moms who were pregnant previously or after.

Neurodevelopmental Effects

Information are more restricted for neurodevelopmental impacts than for birth results and respiratory disease. Be that as it may, air toxins have been connected to a variety of neurodevelopmental messes in youngsters. For instance, in our companion concentrates in New York City and Krakow, Poland, pre-birth openness to PAH's was related with formative postponement, decreased IQ, side effects of tension, gloom, and mindlessness, and decreases in cerebrum white matter surface in youngsters [5].

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Finally, while there is ambiguous evidence linking childhood cancer to air pollution, diesel exhaust particles and PAHs are known to be carcinogenic. According to a recent study, postnatal exposure to residential traffic, but not prenatal exposure, is linked to paediatric leukaemia.

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