

Air pollution causing heart diseases

AIR pollution poses as much health hazard as tobacco smoking, according to a paper published in *Cancer Biology & Medicine* (Zhao, 2019). Fine particles floating in the air, known as PM2.5, present the greatest threat to human health among the air pollutants. These microscopic particles are ten times finer than the thickness of our hair. While breathing in polluted air, PM2.5 quickly reaches our lungs and blood circulation and remains there for a long time.

There can be many sources of PM2.5, such as smoke from coal-based factories, diesel-petrol vehicles, home cookstoves, garbage burning, crop residue burning, etc. PM2.5 is often made of heavy metals, inorganic, and organic constituents. When inhaled, it reaches the lungs and blood circulation, where it can cause unexpected changes in the biochemical pathways vital for sustaining life. These biochemical changes eventually lead to severe diseases of the heart and lungs.

Oxidative stress is the prime manifestation of PM2.5 morbidity, leading to life-threatening heart attacks. In winter, PM2.5 levels in Delhi and most of North India are generally more than 200 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air which is more than three times the daily Indian standard of $60 \mu\text{g}/\text{m}^3$, according to data from the Central Pollution Control Board.

PM2.5 Indian standard has been set four times higher than the WHO's daily standard of $15 \mu\text{g}/\text{m}^3$ to control air pollution mainly arising from industries and vehicles. In contrast, according to a World Bank report, the typical average PM2.5 level in the air across the USA is about $10 \mu\text{g}/\text{m}^3$ only. According to an estimate, every citizen living in Delhi consumes about ten cigarettes daily by breathing in polluted air. Strenuous exercising in polluted air can be fatal and is a great concern for sports enthusiasts, according to the *British Journal of Sports Medicine* (Carlisle, 2001).

According to a study published in August 2021 in the journal *Environment Epidemiology*, air pollution was the cause of nearly 7,00,000 premature deaths in Delhi between 2010–2016, i.e., Delhi alone had more than one lakh air pollution-related deaths every year. According to a news report published in *Amar Ujala* newspaper, there were 5760 heart-related complaints reported in five private hospitals of Ghaziabad (adjacent to Delhi) 20 days during November–December 2021.

About 1000 suffered heart attacks, including those who recovered from COVID-19.

Heart diseases, also known as cardiovascular diseases, are the leading cause of death globally. Although death from heart disease is more common in 60 years of age or older people, there are reports that young people have also died from severe heart diseases such as heart strokes in the last two decades.

High blood pressure and diabetes, which were once called the disease of the elites, have reached villages today. Contaminated food and water are often thought to cause surges. Refined edible oils in daily meals are often implicated in heart diseases. Rising deadly diseases like cancers due to smoking and drinking are well researched and medically proven. However, recent epidemiological researches have revealed many startling facts.

According to WHO and Institute for Health Metrics and Evaluation (IHME) assessments, air pollution is one of the five leading causes of death worldwide. An eminent cardiologist associated with the Harvard Medical School presents terrifying statistics on worldwide deaths linked to air pollution. Air pollution-linked illness was found to be seven crores globally, and 70 lakh people lost their lives, according to the WHO. Out of these deaths, about 24 lakh deaths were associated with Ischemic Heart Disease (IHD), and 13 lakh deaths were due to heart strokes, that is, a total of 37 lakh deaths from heart-ailments.

One out of every five air pollution-related deaths was linked to cardiovascular manifestations globally. This number is even more alarming for India – one in three deaths linked to air pollution-induced heart diseases. For the USA, it is roughly one in 20 deaths.

At the same time, 15 lakh deaths were linked to respiratory illness, 13 lakh deaths to Chronic Obstructive Pulmonary Disease (COPD), and 5 lakh deaths were found associated with lung cancer.

Air pollution is a severe challenge. Without the combined efforts of governments and citizens, we can not win the war against air pollution.

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