
Ozone Pollution Linked With Increased Hospitalisations for CVD



A new study published in the European Heart Journal provides the first evidence linking exceeding the World Health Organization's (WHO) ozone limit with a substantial increase in hospital admissions for heart attack, heart failure, and stroke. Ozone levels below the WHO maximum were also found to be associated with worsened health.

This was a three-year study by Xi'an Jiaotong University in China. The study also found that older people were more vulnerable to the adverse cardiovascular effects of ozone. Hence, climate change may continue to raise concentrations in many parts of the world, increasing the risks of cardiovascular disease in the future.

Ozone is created by volatile organic compounds and nitrogen oxides released by motor vehicles, power plants, industrial boilers, refineries, chemical plants, and biomass and fossil fuel burning facilities. Ozone pollution harms the heart and blood vessels. Previous studies have suggested its influence on the risk of cardiovascular disease. However, this research is limited and inconclusive.

Study researchers collected data on daily hospital admissions for cardiovascular disease in 70 cities in China between 2015 and 2017, covering approximately 258 million people. They examined the association between ambient ozone pollution and hospital admissions for cardiovascular disease. These included coronary heart disease, stroke, and heart failure and subtypes including angina, acute myocardial infarction, acute coronary syndrome, ischaemic stroke, and haemorrhagic stroke.

The study obtained daily eight-hour maximum average concentrations of various air pollutants, including ozone, fine particulate matter (PM_{2.5}), inhalable particles (PM₁₀), sulphur dioxide, nitrogen dioxide, and carbon monoxide.

Exposure to ambient ozone was associated with increased hospital admissions for cardiovascular diseases in all 70 cities in China between 2015 and 2017. Each 10 µg/m³ rise in the two-day average eight-hour maximum ozone concentration was associated with a 0.40% increase in hospital admissions for stroke and 0.75% for acute myocardial infarction.

As highlighted by study authors, ozone levels can surge to higher than 200 µg/m³ in summer, which could amplify these increases by more than 20 times to over 8% for stroke and 15% for acute myocardial infarction.

Compared to levels below 70 µg/m³, levels of 100 µg/m³ or higher were associated with increases in hospital admissions for cardiovascular disease, ranging from 3.38% for stroke to 6.52% for acute myocardial infarction. Lower concentrations of 70 to 99 µg/m³ were also linked with increases in hospital admissions, ranging from 2.26% for heart failure to 3.21% for coronary heart disease.

The researchers suggest that many hospital admissions could be avoided if ozone levels were below 100 µg/m³.

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