

Association of Ambient Air Pollution with Type 2 Diabetes Mellitus, Gestational Diabetes Mellitus and Cardiovascular Diseases [†]

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[†] Presented at Environmental Toxicology: Impact on Human Health (Environ Tox 2021)

Received: 5.11.2021; Revised: 18.11.2021; Accepted: 20.11.2021; Published: 30.11.2021

Abstract: The rapid increase in ambient air pollution is emerging as a risk factor to type 2 Diabetes mellitus (T2DM), gestational diabetes mellitus, and cardiovascular diseases based on short-term exposure, and long term exposure to air pollutants. The effect and risk of toxicity of particulate matter depend on their exposure and dose-response relationship. Ambient air pollution consists of many air pollutants, which can be airborne particulate matter (PM₁₀, PM_{2.5}, PM₁) and gaseous pollutants like ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO_x), sulfur dioxide (SO_x), and volatile organic compounds including benzene (VOCs). Reactive oxygen species are released by cells in the lungs and vascular immune system as a result of air pollution and affect the body organs hence leading to cardiovascular diseases, respiration and diabetes. The air pollutants resist insulin secretion from beta (β) cells in the pancreas, so the glucose level will increase in the blood. During the gestational period, who are suffering from GDM, they have a risk of easily developing preeclampsia during pregnancy and T2DM after pregnancy between 5 to 10 years with this, their offsprings also have the risk of malformations, macrosomia, diabetes, and cardiometabolic diseases, and it will increase later in life.

Keywords: air pollution; cardiovascular disease; gestational diabetes; type 2 Diabetes mellitus.

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Funding

This research received no external funding.

Acknowledgments

I would like to thank the Department of Environmental Science of IIS (Deemed to be University) for providing me with the computer facilities for doing this research work.

Conflicts of Interest

The authors declare no conflict of interest.