Opinion
Volume 13:4, 2023

Journal of Environmental & Analytical Toxicology

ISSN: 2161-0525 Open Access

Baseline DNA Damage of Mother New-born Couples in Mexico City as a Consequence of Air Pollution

Irene Leroux*

Department of Water Analogy, Atatürk University, Erzurum, Turkey

Introduction

Air pollution is a pressing global issue that affects the health and well-being of millions of people worldwide. Mexico City, one of the largest and most populous urban areas in the world, is no exception to this problem. The city's rapid urbanization and industrialization have led to elevated levels of air pollution, primarily driven by vehicular emissions, industrial processes, and deforestation. This prolonged exposure to air pollutants can have detrimental effects on human health, especially on vulnerable populations like pregnant women and new-borns. The relationship between air pollution and its impact on human health is a complex and multifaceted one. Recent research has shown that exposure to air pollution can result in DNA damage, which may have long-term consequences for both mothers and their new-borns.

Description

The baseline DNA damage of mother-new born couples in Mexico City and examines how air pollution serves as a significant contributing factor to this damage. By understanding the genetic implications of air pollution, we can shed light on the urgency of reducing pollution levels and implementing effective public health measures to protect the health of the population [1]. Mexico City is notorious for its air quality issues, largely attributed to a combination of geographical and anthropogenic factors. The city is situated in a high-altitude valley surrounded by mountains which can trap air pollutants, leading to poor dispersion and accumulation of pollutants. Additionally, the region's climate conditions, including temperature inversions, exacerbate air pollution problems. These factors create a microenvironment that makes it particularly vulnerable to air pollution. The city has one of the highest vehicle densities in the world, resulting in significant emissions of pollutants such as Nitrogen Oxides (NOx), Volatile Organic Compounds (VOCs), and Particulate Matter (PM).

The presence of numerous industries contributes to emissions of various pollutants including heavy metals, Sulphur Dioxide (SO2) and other harmful chemicals. On-going deforestation in the surrounding areas further reduces the region's ability to filter air pollutants. Mexico City is also prone to occasional volcanic eruptions, which can release ash and gases into the atmosphere [2]. These combined factors result in consistently high levels of air pollution, which pose severe health risks to the city's residents, particularly pregnant women and new-borns. Air pollution is a complex mixture of gases, liquid droplets, and solid particles, each of which can carry a wide range of chemical compounds. When humans are exposed to air pollution, these pollutants can enter the body through inhalation and other routes of exposure, leading to various adverse health effects, including DNA damage.

DNA damage is a critical concern because it can lead to mutations, which may result in the development of chronic diseases or genetic abnormalities in offspring. Many air pollutants such as fine Particulate Matter (PM2.5) and Polycyclic Aromatic Hydrocarbons (PAHs) can induce oxidative stress. This process generates Reactive Oxygen Species (ROS) within cells, which can attack DNA and cause breaks, base modifications, and other forms of damage. Air pollution can trigger an inflammatory response in the body, leading to the release of cytokines and other inflammatory mediators.

Pregnant women in Mexico City are exposed to high levels of air pollution daily. Studies have found that these women often exhibit increased levels of oxidative DNA damage in their blood and placental tissue. This damage can affect fetal development and may result in adverse outcomes, such as preterm birth and low birth weight. New-borns in Mexico City are born with a baseline level of DNA damage, which is influenced by their mothers' exposure to air pollution during pregnancy. This early DNA damage can have long-term consequences for the child's health, potentially increasing the risk of chronic diseases later in life [3]. Air pollution can also lead to epigenetic modifications in both mothers and their new-borns.

The baseline DNA damage observed in mother-new born couples as a consequence of air pollution has several significant consequences such as DNA damage is associated with an increased risk of various diseases, including cancer, neurodegenerative disorders, cardiovascular diseases, and respiratory diseases. Children exposed to DNA damage in utero may face a higher risk of developing these conditions later in life. Epigenetic modifications caused by air pollution can be passed on to future generations, affecting the health and well-being of offspring. The health consequences of DNA damage from air pollution result in substantial economic costs, including healthcare expenditures and lost productivity [4]. To address the issue of baseline DNA damage in mother-new born couples in Mexico City as a consequence of air pollution, a multifaceted approach is needed implementing stringent regulations and policies to reduce air pollution levels is paramount.

Raising awareness about the health risks associated with air pollution and providing information on protective measures for pregnant women and new born can help reduce exposure. Pregnant women should receive adequate prenatal care and monitoring to identify and address health issues related to air pollution exposure. Continued research is essential to monitor the genetic and health outcomes of mother-new born couples exposed to air pollution. This can inform public health policies and interventions. Incorporating green spaces, pedestrian-friendly infrastructure, and public transportation systems can reduce the reliance on private vehicles, thus lowering pollution levels in urban areas [5].

Conclusion

In conclusion, the baseline DNA damage of mother-new born couples in Mexico City due to air pollution is a critical issue with profound genetic, health, and ethical implications. Efforts to address this problem must be holistic, encompassing policy changes, public awareness campaigns, healthcare interventions, and on-going research. Moreover recognizing the international relevance of this issue underscores the importance of global collaboration to combat air pollution and safeguard the genetic health of populations around the world.

Acknowledgement

None.

***Address for Correspondence:** Irene Leroux, Department of Water Analogy, Atatürk University, Erzurum, Turkey, E-mail: leroux@irene.research.tk*

Received: 03 July, 2023, Manuscript No. jeat-23-113559; **Editor Assigned:** 05 July, 2023, PreQC No. P-113559; **Reviewed:** 17 July, 2023, QC No. Q-113559; **Revised:** 22 July, 2023, Manuscript No. R-113559; **Published:** 29 July, 2023, DOI: 10.37421/2161-0525.2023.13.722

Conflict of Interest

None.

References

1. Texcalac-Sangrador, Jose Luis, Magali Hurtado-Díaz, Eunice Elizabeth Félix-Arellano and Carlos Manuel Guerrero-López, et al. "Health and economic impacts assessment of O_3 exposure in Mexico." *Int J Environ Res Public Health* 18 (2021): 11646.
2. Pereira, Luiz A., Dana Loomis, Gleice M. Conceicao and Alfesio L. Braga, et al. "Association between air pollution and intrauterine mortality in São Paulo, Brazil." *Environ Health Perspect* 106 (1998): 325–329.
3. Yang, Yang, Runkui Li, Wenjing Li and Meng Wang, et al. "The association between ambient air pollution and daily mortality in Beijing after the 2008 olympics: A time series study." *PLoS ONE* 8 (2013): e76759.
4. Torrico-Lavayen, Rocio, Gilberto Vargas-Alarcón, Horacio Riojas-Rodriguez and Marco Sánchez Guerra, et al. "Long-term exposure to ambient fine particulate matter and carotid intima media thickness at bilateral, left and right in adults from Mexico city: Results from GEA study." *Chemosphere* 335 (2023): 139009.
5. Calderon-Garciduenas, Lilian, Norma Osnaya-Brizuela, Leticia Ramirez-Martinez and Anna Villarreal-Calderon, et al. "DNA strand breaks in human nasal respiratory epithelium are induced upon exposure to urban pollution." *Environ Health Perspect* 104 (1996): 160.

How to cite this article: Leroux, Irene. "Baseline DNA Damage of Mother Newborn Couples in Mexico City as a Consequence of Air Pollution." *J Environ Anal Toxicol* 13 (2023): 722.