STUDENTS' CORNER
LETTER TO THE EDITOR

Pollution-induced arrhythmia: A potential threat for Pakistan

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Madam, Pollution has always been a hovering menace towards health and impacts derived from ill health, i.e., socio-economic adversities. The presence of pollution has become more conspicuous as the environment gradually degrades. Pakistan is no exception. Diseases stemming from pollution have cost around 22,000 annual deaths.[1] Symptoms of exacerbation can be seen as dominant pollutants, i.e. NO_x, Ozone (O_3), SO_2, CO, and particulate matter (PM), increase in quantity, and effects seeping into the cardiac system, inducing an array of arrhythmias, a condition associated with irregular, the abnormal beating of the heart, at times intensifying to mortalities.

Multiple studies have ascertained the link between arrhythmia and pollution. 'Danish Diet, Cancer, and Health cohort' highlights an 8% increased chance of Atrial fibrillation and; a variety of arrhythmia [incidence rate ratio: 1.08; 95% confidence interval (CI): 1.01, 1.14] due to prolonged NO_2 exposure.[2] CO has similar tendencies, with an increase of 1mg/m^3 causing 11.3% (- 5.9, 31.6%) higher risk of arrhythmia.[3] Extended exposure to PM of diameters 2.5 and 10 µm resulted in a greater tendency to develop incident bradycardia and right bundle-branch block, with a similar tendency of sustaining premature atrial contraction and bradycardia, respectively (all being types of arrhythmias).[4]

Mechanism behind development of arrhythmia, involves PM of different diameters and its components (e.g. Copper, Iron) reacting with the endothelial lining, birthing ROS. This subsequently leads to inflammation and pathological activation of thrombotic factors. Consequences include damage to vessel and heart endothelial functionality and structural composition.[4] Gradually, the adverse effects spread onto the nervous system, impairing the ANS, responsible for regulating heart rate, inducing arrhythmia. Pakistan, priorly mentioned, is a pollutant-saturated country, with Lahore ranking top on the worst Air Quality Index (AQI).[5] In the above paragraphs, the aim was to enumerate pollutants also present in Pakistan, in significant amounts, and mention their role in inducing 'arrhythmia'. This heart disease further weakens the cardiac system, allowing other diseases to develop and even become fatal. The reason for writing this LTE was to increase awareness of the importance of better air quality and to highlight how Pakistan might be facing an increase in cardiac patients if the issue is not tackled on utmost priority. As our article enumerates the consequences and current statistics show Lahore being at 23.7 times worse than WHO annual air quality guideline value, all of it ascertains the existence of an underlying threat.

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