

Effect of Air Pollution on Human Health

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To the Editor:

I read the article “Research on air pollution characteristics and planning strategy of urban street environment” published in the *Journal of Building Design and Environment* in 2023. In this study, the authors carried out measurements of NO₂, O₃, PM₁₀ and PM_{2.5} on a busy street and on streets further away from it. The proximity of the monitors to the road varies between 1 metre and 1.6 kilometres (7 monitors within the first 100 metres and the others at distances of 105, 220, 250 metres and 1.6 kilometres respectively)^[1].

In this study, the authors aimed to investigate the severity of air pollution in urban streets. For this purpose, they investigated the effects of not only traffic and meteorological factors in the city but also the design of buildings and streets in the city. It was stated that NO₂, O₃, PM₁₀, and PM_{2.5} have a “formation-accumulation-diffusion” cycle. In addition to traffic and meteorological factors, traffic flow and the wind pattern of the street were shown to lead to varying pollution levels in a certain order. According to the findings of this study, the ratio of NO₂ and

O₃ to background concentration is highest during the morning hours when traffic is dense, and in the vicinity of the road, NO₂ and O₃ gradually accumulate, reaching their highest pollution levels in the evenings. Pollution levels of PM_{2.5} and PM₁₀ are higher in the mornings and then show a horizontal trend. While the pollution levels of NO₂ and O₃ sharply decrease 80 meters away from the road, the impact range of PM_{2.5} and PM₁₀ can exceed 200 meters. Low temperature, high humidity, and low-pressure conditions increase the measured air pollution values on the street^[1]. It can be considered a disadvantage for this study that most monitors are located less than 200 meters from the road. Additionally, measuring NO₂, O₃, PM₁₀, and PM_{2.5} inside homes could have been beneficial.

My colleagues and I have been researching the adverse effects of air pollution on human health for a long time^[2-5]. According to our findings, PM₁₀ exposure can affect pulmonary mortality and morbidity^[2]. Furthermore, cardiac-related chest pain is associated with increased hospitalization and mortality^[3]. Although environmentally induced PM₁₀ effects were not found effective, an increase in PM₁₀ due to desert



dust storms has been shown to cause miscarriage and preeclampsia/eclampsia in pregnant women and stroke in adult patients^[4, 5]. However, the locations of the buildings where patients reside and their proximity to traffic-congested roads were not considered during these studies. Due to the retrospective nature and the inclusion of a large number of patients in these studies, this was not feasible.

Based on this information, not only personal measures but also the importance of urban planning should be emphasised in reducing the adverse effects of air pollution. In this study, important recommendations are given for the improvement of urban air quality^[1]. The importance of optimisation of street geometry, traffic flow and building ventilation in the improvement of urban air quality is emphasised. In addition, this study contains important clues for scientists investigating the effects of air pollution on health to provide effective conclusions and recommendations.

References

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