Air pollution with particulate matter and other environmental and endogenous factors

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Dear Editor,

We read with interest the article by Tobias et al on the recommendation to use time series analyses to investigate the short-term health effects of particulate matter pollution in the Eastern Mediterranean Region (EMR) (1). The article concludes that epidemiological studies are urgently needed to clarify the health consequences of particulate matter pollution, which is exacerbated by frequent dust and sand storms (1). The article is noteworthy, but some ambiguities should be clarified.

The first point is that particulate matter is not only transported by storms in the lower atmosphere (troposphere), but also in higher regions of the atmosphere such as the mesosphere and stratosphere (2). Since air movements in these regions also depend on the earth's magnetic field, the earth's rotation, cosmic radiation, solar winds, and planetary constellations, these factors should be considered when assessing the health effects of particulate matter in the air.

The second point is that the amount of spherical particulate matter also depends on regional and global volcanic activity (3). If there is increased volcanic activity in nearby countries with active volcanoes, such as Iceland and Italy , and if the prevailing wind directions cause the volcanic dust to be blown into the EMR, the particulate matter concentration will also increase there.

The third point is that EMR is constantly polluted by the oil and gas industries, as is the case in Iraq, Islamic Republic of Iran, Kuwait, Saudi Arabia, and Syria. Since gas from oil fields is often flared and not reused, the constant burning of gas causes increased production of soot particles and thus an increase in particulate matter pollution.

The fourth point is that particulate matter pollution in the EMR is also caused by air pollution due to recurring or continuous conflicts in several countries in the region. Sources of air pollution in these cases include military aircraft, tanks, artillery, drones, military trucks and vehicles, bombings including the bombing of tactical targets such as oil refineries, ammunition depots, power plants, and chemical industry complexes.

The fifth point is that, due to the increase in average temperatures in the Middle East, people tend to leave their car engines running while stationary so that their air conditioning systems can continue to function. This causes unnecessary increase in emissions from vehicles, which of course also contribute to an increase in particulate matter concentrations.

The sixth point is that the effects of particulate matter on health can vary greatly depending on where a person lives. People who live in areas with industries that produce particulate matter (e.g. refineries, chemical industry, waste incineration plants) or heavy traffic are more likely to be exposed to toxic levels of particulate matter than patients who live in a quiet and green area.

Seventh, human health may depend not only on the extent of particulate matter exposure, but also on a number of other factors, such as diet, food quality, water quality, lifestyle, mental clarity, and the extent of exposure to electromagnetic pollution.

Overall, the causes of particulate matter are more diverse than previously thought. The long-term effects of particulate matter on health may not occur immediately, but only after months or years of exposure, affecting the respiratory system (e.g. asthma, impaired lung maturation, bronchitis, lung cancer), the cardiovascular system (e.g. arteriosclerosis, high blood pressure, blood clotting), metabolism (e.g. type-2 diabetes mellitus), and the nervous system (e.g. dementia). Every effort must be made to reduce air pollution caused by particulate matter.

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Response by authors of the article

Dear Editor,

Thank you for the opportunity to respond to the comments.

The comments basically highlight the sources of air pollution in the EMR, which was not the subject of our article. The objective of our article was to encourage policymakers and researchers to conduct time series analyses of air pollution and health data to better understand the short-term impact of particulate matter in dusty environments. Such analyses are recommended by the WHO global air quality guidelines. However, the sources of air pollution mentioned in the comments are not accurate. We would like to refer the authors to the article by Faridi et al (1), which provides a better information about the sources of air pollution in the EMR.

Reference

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