

Impact of air pollution on severe acute exacerbation of COPD

Miqdad Haider¹

Muhammad Nabeel Shafqat²

Mariam Zafar³

¹Department of Internal Medicine, Fatima Memorial Hospital, Fatima Memorial College of Medicine and Dentistry, Lahore, Pakistan;

²Department of Medicine, University of Medical Sciences "Serafin Ruiz de Zarate" Villa Clara (UCMVC), Villa Clara, Cuba; ³Department of Medicine, Basic Health Unit, Nankana Sahib, Pakistan

Dear editor

We would like to comment on the article "Harmful impact of air pollution on severe acute exacerbation of chronic obstructive pulmonary disease: particulate matter is hazardous" by Choi et al which was published recently.¹ Keeping in view the current state of affairs of our planet, and knowing that industrialization is growing fast, this article is very important in highlighting some critical issues. This is what makes this article interesting and important at the same time.

COPD is a progressive lung disease characterized by persistent symptoms of the respiratory system and decreased airflow. The most common cause is tobacco smoking, while other contributing factors include genetics and air contamination. Long-term exposure to these irritants causes an inflammatory response in the lungs, resulting in narrowing of the small airways and breakdown of lung tissue.²

The solid and liquid particles suspended in air are called particulate matter (PM). Most of them are hazardous for human health. The exact mechanism by which these particles cause adverse effects is unknown, although various epidemiological studies have consistently demonstrated their toxicity.³

In this study, performed as a retrospective analysis, Choi et al have tried to find out the relation between various air pollutants and the incidence of severe acute exacerbations of COPD. This study, which examined various air pollutants causing hospitalization due to exacerbation of COPD during a period extending more than 2 years, concluded that air pollution increases the incidence of such events. PM was found to be the major contributor of air pollution in the studied area. There have been no previous similar studies in the particular region, as claimed by the authors.

Similar epidemiological studies have been conducted in other parts of the world, mostly on the general healthy population. Most of these studies support the association between PM and worsening of respiratory conditions. A review article by Anderson et al reached the conclusion that PM has a small but consistent and significant effect on human health.⁴ However, they agree that overall the small individual effects result in a large global public health burden. We would like to add here that an interesting study by Sacks et al tried to identify the groups susceptible to PM-related health effects; the study focused on age group, low-socioeconomic status, previous cardiovascular or respiratory diseases and genetics.⁵

In our opinion, similar studies must be conducted in other parts of the world, preferably multicenter studies, as results can be affected by factors like particular atmosphere, and racial and cultural differences of different regions of the world. Further studies are needed to make a comparison of PM-related health issues in developing and

Correspondence: Miqdad Haider
Department of Internal Medicine, Fatima Memorial Hospital, Fatima Memorial College of Medicine and Dentistry, Shadman, Lahore, Pakistan
Email miqdad14@yahoo.com

developed countries. Future studies must be carried out for COPD exacerbations that do not require hospitalizations.

Disclosure

The authors report no conflicts of interest in this communication.

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Authors' reply

Juwhan Choi

Jee Youn Oh

Young Seok Lee

Gyu Young Hur

Kyung Hoon Min

Sung Yong Lee

Kyung Ho Kang

Jae Jeong Shim

Division of Pulmonary, Allergy, and Critical Care Medicine,
Department of Internal Medicine, Korea University Guro Hospital,
Korea University College of Medicine, Seoul, Republic of Korea

Correspondence: Jae Jeong Shim

Division of Respiratory and Critical Care Medicine, Department of
Internal Medicine, Korea University Guro Hospital, Korea University
College of Medicine, 148 Gurodong-ro, Guro-gu, Seoul 08308, Republic
of Korea

Tel +82 2 2626 1029

Fax +82 2 2626 1166

Email jaejshim@kumc.or.kr

Dear editor

We would like to comment on the letter to the editor about our study. As was mentioned, most studies have admitted the adverse effects of particulate matter. However, studies on various conditions (age, sex, region, exposure history, outdoor activity and job) are lacking. Of course, a study of

the nonhospitalized acute exacerbation of COPD group is also lacking and in need. However, the most important point here is that the fundamental mechanism of particulate matter has yet to be revealed. A recently published study by Ramanathan et al suggests that particulate matter may cause eosinophilic inflammation in a mouse model.¹ Eosinophilic inflammation in the airway is likely to promote acute exacerbation of COPD, which we believe could explain the fundamental mechanism in our research. In addition, although our study is a retrospective and single-center study, Korea is one of the high-particulate matter countries, which is useful for analyzing the effect of particulate matter. And, we think that our study has a clinical advantage because it is a study of patients who were continuously followed up. We hope that a large-scale, prospective and multicenter study will be supported in the future.

Disclosure

The authors report no conflicts of interest in this communication.

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