COVID-19 incidence and local ozone level: is there any association?

Dear Editor,

Coronavirus disease 2019 (COVID-19) is a new coronavirus respiratory infection. This new emerging infection disease has already caused more than 30,000,000 infected cases worldwide since its first appearance in late 2019. The effect of underlying metrological background on the incidence of the COVID-19 is an interesting issue but little is known on this issue.[1] In fact, the effect of environmental gas on the respiratory infection is an important issue in public health.[2] Focusing on local environmental gas in atmosphere, the association with local COVID-19 incidence has never been assessed.

We analyzed the data to assess the relationship between COVID-19 incidence and local ozone level in a tropical country which is the second country of the world getting affected by the new emerging COVID-19. The primary data on incidence of COVID-19 was derived from local Public Health Ministry and the primary data of local ozone was derived from Department of Pollution Control of Thailand. The studied area in the present study is the area covering 13 provinces (Payao, Phare, Uttaradit, Pitsanuloke, Pichit, Nongbualumpu, Chaiyaphum, Mahasarakham, Roiet, Yasothorn, Sakonnakorn, Beungkarn and Kalaasin) in rural northern and northeastern region areas of Thailand which is not a destination for international tourists. In the present study, only data on non-local transmission COVID-19 cases were used for further analysis. The data were collected between March and June 2020, when the COVID-19 outbreak started in the studied area following its first appearance in China. According to the study, the scatterplot shows the relationship between COVID-19 incidence and ozone level (**Figure 1**). There was no significant correlation ($r = 0.076$, $P = 0.805$) between COVID-19 incidence and local ozone level in the studied area.

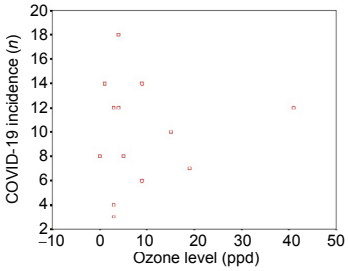

Figure 1: Relationship between coronavirus disease 2019 (COVID-19) incidence and local ozone level.
Note: From Pearson's correlation analysis, there was no significant correlation between COVID-19 incidence and local ozone level ($r = 0.076$, $P = 0.805$).

The association between ozone and COVID-19 is still poorly understood. The positive effect of ozone therapy on the COVID-19 infection has been reported.[3] The cytoprotection of ozone may attribute to the therapeutic effect of ozone on COVID-19 infection.[3,4] In the present report, we assessed the interrelationship between environmental ozone level and COVID-19 incidence. Interestingly, there was no association between them. In some areas with high ozone level still have high incidence (number) of COVID-19 cases. This might not support that environmental ozone background can have protective effect against severe acute respiratory syndrome coronavirus 2 infection. This preliminary observation may provide evidence for further investigations on this issue.

Beuy Joob*, Viroj Wiwanitkit

Medical Academic Center, Bangkok Thailand (Joob B)
Department of Community Medicine, Dr DY Patil University, Pune, India (Wiwanitkit V)

*Correspondence to: *Beuy Joob, MD, beuyjoob@hotmail.com.*
orcid: 0000-0002-5281-0369 (Beuy Joob)
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References

1. Bashir MF, Ma B, Bilal, et al. Correlation between climate indicators and COVID-19 pandemic in New York, USA. *Sci Total Environ.* 2020;728:138835.
2. Domingo JL, Rovira J. Effects of air pollutants on the transmission and severity of respiratory viral infections. *Environ Res.* 2020;187:109650.
3. Martínez-Sánchez G, Schwartz A, Donna VD. Potential cytoprotective activity of ozone therapy in SARS-CoV-2/COVID-19. *Antioxidants (Basel).* 2020;9:389.
4. Valdenassi L, Franzini M, Ricevuti G, Rinaldi L, Galoforo AC, Tirelli U. Potential mechanisms by which the oxygen-ozone (O_2-O_3) therapy could contribute to the treatment against the coronavirus COVID-19. *Eur Rev Med Pharmacol Sci.* 2020;24:4059-4061.

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