

SLEEP MEDICINE PEARLS

Asthma Exacerbation in the Spouse of a Patient With Obstructive Sleep Apnea

Mirna Ayache, MD, MPH¹; Patricia Kellner, MD²; Ambrose Chiang, MD¹

¹Division of Pulmonary, Critical Care and Sleep Medicine, University Hospitals Cleveland Medical Center, Cleveland, Ohio; ²Department of Family Medicine, University Hospitals Cleveland Medical Center, Cleveland, Ohio

A 68-year-old female never smoker with a history of allergic rhinitis and mild intermittent asthma accompanied her husband to his sleep physician visit and inquired about returning his continuous positive airway pressure (CPAP) cleaning device (SoClean2, SoClean Inc Peterborough, New Hampshire, United States) for a refund. She reported worsening shortness of breath, wheezing and increased need to use her rescue inhaler. Her symptoms started after being exposed to a smell linked to the device. Due to cold winter weather, she was unable to open windows to improve their bedroom's ventilation. Historical triggers for her asthma include dusts, pollens

and perfumes. Her asthma medications were albuterol inhaler as needed, used only occasionally with allergen exposures, and montelukast in the fall and spring seasons. The patient's asthma exacerbation did not require an urgent medical visit and she self-treated by frequent use of albuterol inhaler in addition to restarting montelukast.

QUESTION: Given the situation, what course of action is recommended?

ANSWER: Discontinue use of ozone cleaning device.

After discontinuing use of the ozone cleaning device, the patient's asthma symptoms improved in 2–3 days and she stopped montelukast 2 weeks following improved symptoms. She did not have any wheezing on examination during a subsequent visit to her primary care doctor.

DISCUSSION

Higher ambient ozone concentration may be associated with increased incidence of asthma in children¹ and adults.² Ozone pollution has been linked to respiratory symptoms³ and an increase in asthma exacerbations.^{4,5} There is also some evidence to suggest that ozone exposure increases reactivity to allergens in mild atopic asthma⁶ and increases risk of death in severe asthma.⁷ Sanitizing devices that utilize ozone for disinfecting CPAP machines have been increasingly adopted by CPAP users. This case illustrates a possible link between asthma flare and the use of ozone generating CPAP cleaner. It is important for sleep physicians to be alert to the possible pulmonary complications of these cleaning devices. The potential effects of ozone exposure on asthma should be discussed with an asthmatic patient who is considering the use of an ozone cleaning device. We also advise that history be obtained about family members, especially bed partners, who may have asthma and suffer consequences of ozone exposure. A CPAP cleaning device using UV light⁸ may be an option if asthma flare is a concern. Further post-marketing studies may be helpful to clarify the potential risks associated with the use of various CPAP cleaners.

SLEEP MEDICINE PEARLS

1. CPAP cleaning devices that utilize ozone may be associated with worsening asthma symptoms.
2. Clinicians who prescribe CPAP machines should be aware of the potential pulmonary complications of ozone generating CPAP cleaning devices and provide accordingly appropriate education to CPAP users.

CITATION

Ayache M, Kellner P, Chiang A. Asthma exacerbation in the spouse of a patient with obstructive sleep apnea. *J Clin Sleep Med*. 2018;14(9):1631–1632.

REFERENCES

1. McConnell R, Berhane K, Gilliland F, et al. Asthma in exercising children exposed to ozone: a cohort study. *Lancet*. 2002;359(9304):386–391.
2. McDonnell WF, Abbey DE, Nishino N, Lebowitz MD. Long-term ambient ozone concentration and the incidence of asthma in nonsmoking adults: the AHSMOG Study. *Environ Res*. 1999;80(2 Pt 1):110–121.
3. Gent JF, Triche EW, Holford TR, et al. Association of low-level ozone and fine particles with respiratory symptoms in children with asthma. *JAMA*. 2003;290(14):1859–1867.
4. White MC, Etzel RA, Wilcox WD, Lloyd C. Exacerbations of childhood asthma and ozone pollution in Atlanta. *Environ Res*. 1994;65(1):56–68.
5. Silverman RA, Ito K. Age-related association of fine particles and ozone with severe acute asthma in New York City. *J Allergy Clin Immunol*. 2010;125(2):367.e5–373.e5.
6. Kehrl HR, Peden DB, Ball B, Folinsbee LJ, Horstman D. Increased specific airway reactivity of persons with mild allergic asthma after 7.6 hours of exposure to 0.16 ppm ozone. *J Allergy Clin Immunol*. 1999;104(6):1198–1204.
7. Sunyer J, Basagana X, Belmonte J, Anto JM. Effect of nitrogen dioxide and ozone on the risk of dying in patients with severe asthma. *Thorax*. 2002;57(8):687–693.
8. Brannon D. Introducing Lumin: A New Kind of CPAP Cleaner. <https://www.cpap.com/blog/lumin-cpap-cleaner/>. Updated 2018. Accessed April 10, 2018.

SUBMISSION & CORRESPONDENCE INFORMATION

Submitted for publication April 16, 2018

Submitted in final revised form April 16, 2018

Accepted for publication June 1, 2018

Address correspondence to: Mirna Ayache, MD, MPH, 2355 Botanica Lane Pepperpike, OH, 44124; Email: ayachemirna@hotmail.com

DISCLOSURE STATEMENT

All authors have seen and approved the manuscript. Work for this study was performed at University Hospitals Cleveland Medical Center. The authors report no conflicts of interest.