

## CPAP-Related Aerophagia: Awareness First!

Commentary on Shepherd et al. Symptoms of aerophagia are common in patients on continuous positive airway pressure therapy and are related to the presence of nighttime gastroesophageal reflux. *J Clin Sleep Med* 2013;9:13-17.

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**A**erophagia—or air swallowing—results in burping, abdominal distention, and discomfort, and oh my—flatulence! Aerophagia can develop during continuous positive airway pressure (CPAP) use. But most CPAP patients do not openly complain of aerophagia symptoms, and clinicians may not specifically ask about it. Furthermore, there is minimal literature available concerning CPAP-related aerophagia and its consequences.

To examine CPAP-related aerophagia prevalence, Shepherd et al. examined consecutive OSA patients currently on CPAP undergoing polysomnography for optimal CPAP pressure determination. Note that this CPAP population may have been enriched with patients having difficulty tolerating CPAP.<sup>1</sup> Using a validated gastroesophageal reflux (GER) questionnaire that was altered to examine sleep-related GER symptoms and aerophagia, they noted that of 259 patients, 130 (50%) had at least one aerophagia symptom during the previous period of CPAP use (median CPAP use of 1 to 6 months). Aerophagia was defined by the presence of one symptom during CPAP use. Since some symptoms are not specific for aerophagia (diarrhea), this study may have overestimated aerophagia prevalence. Nevertheless, the presence of aerophagia needs to be assessed in our CPAP patients, especially in those with difficulty tolerating or adhering to CPAP.

In OSA patients with GER, CPAP use reduces sleep-related GER symptoms and esophageal acid contact times during sleep.<sup>2,3</sup> Shepherd et al. previously noted that CPAP increased esophageal pressure and lower esophageal sphincter (LES) tone, thus reducing the risk of individual GER events.<sup>4</sup> However, in this current investigation, the use of GER medications, GER symptoms and nighttime-related GER symptoms, predicted aerophagia with CPAP use. Furthermore, a subset of 127 patients completed the same questionnaire before initiating CPAP therapy and individuals with preexisting GER symptoms were *not* more likely to develop aerophagia while on CPAP; thus the authors concluded that aerophagia may actually precipitate GER.

There are many unanswered questions concerning CPAP-induced aerophagia. First, it may be difficult to quantitate, and much work needs to be done to better define and quantitate it in a validated way. Secondly, investigations are needed to evaluate how CPAP-related aerophagia causes individual GER

events. For instance, is the esophago-upper esophageal sphincter (UES) contractile reflex altered in OSA patients? How does CPAP alter this reflex? What differentiates OSA subjects with aerophagia versus those without aerophagia from an esophageal manometry standpoint? How can transient LES relaxations, the most common cause of individual GER events, be prevented when aerophagia occurs? Treating GER events triggered by CPAP-induced aerophagia can be problematic. Baclofen is the only medication available that reduces transient LES relaxation frequency.<sup>5</sup> Currently, no data exist on how to best manage CPAP-induced aerophagia. Does lowering CPAP pressure, adding expiratory pressure release, or using auto-adjusting CPAP or bilevel PAP decrease aerophagia? Data need to be collected on how best to manage these patients.

One potential way to prevent aerophagia would be to increase UES pressure during sleep. With sleep onset, UES pressure decreases, predisposing to aerophagia. Although increasing UES pressure during sleep may be difficult, applying extrinsic pressure to the area of the UES may increase its pressure. Shaker et al. have developed an adjustable soft band attached to a small pressure pad that is externally applied around the neck, compressing the UES between the cricoid cartilage and the cervical vertebrae, resulting in an increase in UES pressure.<sup>6</sup> This “UES Assist Device” is currently undergoing clinical trials for potential FDA approval, and it has not been tested in aerophagia patients using CPAP.

Dr. Shepherd and colleagues have made us keenly aware of the need for us to question our CPAP-treated patients for the presence of aerophagia and whether they developed reflux symptoms after initiating CPAP therapy. However, much needs to be learned about mechanisms of aerophagia development and how best to treat aerophagia in our patients.

### REFERENCES

1. Shepherd K, Hillman D, Eastwood P. Symptoms of aerophagia are common in patients on continuous positive airway pressure therapy and are related to the presence of nighttime gastroesophageal reflux. *J Clin Sleep Med* 2013;9:13-7.
2. Green BT, Broughton WA, O'Connor JB. Marked improvement in nocturnal gastroesophageal reflux in a large cohort of patients with obstructive sleep apnea treated with continuous positive airway pressure. *Arch Intern Med* 2003;163:41-5.
3. Kerr P, Shoenuit JP, Miller T, et al. Nasal CPAP reduces gastroesophageal reflux in obstructive sleep apnea syndrome. *Chest* 1992;101:1539-44.

4. Shepherd KL, Holloway RH, Hillman DR, et al. The impact of continuous positive airway pressure on lower esophageal sphincter. *Am J Physiol Gastrointest Liver Physiol* 2007;292:G1200-5.
5. Cossentino MJ, Mann K, Armbruster SP, et al. Randomised clinical trial: the effect of baclofen in patients with gastro-oesophageal reflux – a randomised prospective study. *Aliment Pharmacol Ther* 2012 Mar 20. [Epub ahead of print]
6. Shaker R, Naini SR, Hafeezullah M, et al. A novel "UES" assist device for prevention of supine pharyngeal reflux of gastric content. *Gastroenterology* 2011;140(Suppl 1):S-190.

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## DISCLOSURE STATEMENT

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