



## BPAP for CPAP failures: For the many or the few

### Citation

Omobomi, Olabimpe, and Stuart F Quan. "BPAP for CPAP failures: For the many or the few." *Respirology* (Carlton, Vic.) 25, no. 4 (2020): 358-59.

### Permanent link

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## **Title Page**

### **BPAP for CPAP Failures, For the Many or the Few**

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### **Key Words**

Continuous Positive Airway Pressure  
Bilevel Positive Airway Pressure  
Obstructive Sleep Apnea

## Editorial

Positive Airway Pressure (PAP) therapy is the primary treatment modality for obstructive sleep apnea (OSA).<sup>1</sup> While continuous PAP (CPAP) was the first treatment modality described in 1981, Bilevel PAP (BPAP) has subsequently been found to be effective in the treatment of OSA. Traditionally BPAP was primarily used for OSA with comorbid respiratory disorders, but it is also used in uncomplicated OSA for a variety of reasons including CPAP failure due to higher pressure requirements or CPAP intolerance due to pressure discomfort. Despite its use for CPAP failures, there is a paucity of evidence that BPAP is effective in these patients.<sup>1</sup>

In the current issue of *Respirology*, Ishak et al conducted an observational prospective study on the outcomes of BPAP therapy in adult obese patients with OSA (mean AHI 51.1 /h) who had high CPAP pressure requirements (defined as >15cmH<sub>2</sub>O) and were non-adherent to CPAP therapy (defined as usage < 4 hours/day).<sup>2</sup> Their study showed that 75.7% of the cohort achieved adequate nightly adherence (usage >4 hours a night) with BPAP vs. 42.9% with CPAP. BPAP consequently achieved greater improvements in sleepiness compared to CPAP as evidenced by greater reduction in the Epworth Sleepiness Scale (ESS) from baseline. Interestingly, they also found that whilst BPAP and CPAP demonstrated similar efficacy measured by residual apnea hypopnea indices (AHI) or oxygen desaturation indices (ODI), expiratory positive airway pressure (EPAP) requirements on BPAP were lower than previous CPAP pressure requirements. The authors propose that BPAP is an appropriate second line option for obese patients with moderate to severe OSA with high pressure requirements who are non-adherent to CPAP therapy.

One prior study using BPAP as rescue therapy for CPAP non-adherent patients similarly demonstrated clinically significant improvement in adherence.<sup>3</sup> However this superior adherence to CPAP has not been reproducible when BPAP was used as first line therapy.<sup>4, 5</sup> Prior studies comparing CPAP to BPAP therapy in OSA patients have shown similar improvements in subjective sleepiness with either therapy, hence the improvement in sleepiness in this study is likely related to improved adherence.

With auto-titrating CPAP devices, average pressure requirements are typically less than traditional fixed CPAP pressures obtained during titration studies,<sup>6</sup> but there is no prior available data to support this study's finding that EPAP pressure requirements with BPAP are lower than with CPAP. Further studies are necessary to confirm this observation which would likely be an explanation for the better adherence with BPAP.

Unfortunately, the study cohort comprised only obese patients (average body mass index = 42.6 kg/m<sup>2</sup>), the majority of whom had comorbid respiratory disorders or neuromuscular weakness and thus represent more complicated phenotypes of sleep disordered breathing. This is a group of patients who may benefit more from BPAP than other OSA patients. For example, BPAP

should be more effective than CPAP in reducing or eliminating the documented nocturnal and daytime hypercapnia in this cohort <sup>7</sup> and may also be more effective at reducing the work of breathing in patients with coexisting neuromuscular weakness. These additional benefits from BPAP therapy might have resulted in better treatment outcomes and favorably impacted the results.

A study by Schwartz et al <sup>8</sup> found that improved adherence with BPAP compared to CPAP was largely explained by clinical factors that would predict better suitability for BPAP. These included higher BMI, comorbid congestive heart failure, higher blood CO<sub>2</sub>, greater OSA severity and lower oxygen nadirs. Several of these characteristics were present in the cohort studied by Ishak et al. It is therefore possible that in retrospect, BPAP was a better first line treatment option for these patients and hence is the explanation for the observed improvement in adherence once the switch was made to BPAP.

While the Ishak et al study reminds us that BPAP is a useful tool in OSA patients who are non adherent to CPAP and those with high CPAP pressure requirements, these results may not be generalized to uncomplicated OSA in non obese individuals. Regardless, a trial of BPAP is a viable option in patients who fail CPAP prior to proceeding to alternative therapies given its similar efficacy to CPAP. However, BPAP should not be used as first line therapy in uncomplicated OSA patients as it may constitute a heavier financial burden on patients and the health system, and has not been found to offer superior effectiveness to CPAP in uncomplicated OSA. <sup>5</sup>

## References

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