

COMMENTARY

CPAP Use: Unmasking the Truth about Interface

Commentary on Ng et al. Choosing an oronasal mask to deliver continuous positive airway pressure may cause more upper airway obstruction or lead to higher continuous positive airway pressure requirements than a nasal mask in some patients: a case series. *J Clin Sleep Med* 2016;12(9):1227–1232 and Deshpande et al. Oronasal masks require a higher pressure than nasal and nasal pillow masks for the treatment of obstructive sleep apnea. *J Clin Sleep Med* 2016;12(9):1263–1268.

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As the gold-standard therapy, continuous positive airway pressure (CPAP) is efficacious in reversing many of the adverse symptoms associated with obstructive sleep apnea (OSA). The literature suggests a dose-response relationship between hours of CPAP use and improvement in outcomes such as daytime sleepiness and sleep quality; however, several studies have demonstrated suboptimal rates of long-term CPAP adherence.^{1,2} Several factors can contribute to diminished PAP adherence, including symptom burden, social and demographic factors, comorbid conditions, and interactions with the healthcare system.³

Significant knowledge gaps still exist pertaining to the role of the interface in PAP acceptance and adherence. Mask comfort is likely among the more important factors that can significantly influence the ability to use CPAP,⁴ particularly in the period immediately after initiating therapy, which may determine long-term adherence.⁵ Masks come in several sizes and styles, most of which fit into the categories of full-face/oronasal masks, nasal cushion masks, and nasal pillows. Choosing a comfortable and effective mask is critical in order to provide a new CPAP user with a good chance of long-term success, and yet despite this, there are no clear guidelines for selecting masks. Furthermore, robust prospective data that address this elementary issue are lacking. Few labs employ a systematic procedure for mask choice, and there are no readily available objective assessments that can be employed in a clinical setting. Thus, mask choice is a highly variable and subjective procedure.

Conventionally, a full-face mask has been considered an equal choice to a nasal cushion or nasal pillow interface, and preferable in certain circumstances such as patients with predominant oral breathing. However, accruing data suggest the superiority of nasal over oronasal masks. This issue of the *Journal of Clinical Sleep Medicine (JCSM)* contains two studies supporting this premise. Ng et al. present four diverse case studies, each illustrating the superiority of nasal mask over oronasal mask in terms of residual sleep disordered breathing and/or PAP pressure requirement.⁶ Deshpande et al. have reported results from a retrospective analysis of clinical CPAP titrations, which suggested a higher pressure requirement with oronasal masks compared to nasal masks.⁷ The reasons for this

are not entirely clear, although small studies suggest that oronasal masks may worsen upper airway obstruction by either displacing the mandible posteriorly or increasing upper airway collapsibility by virtue of mouth-opening, thus requiring a higher pressure to maintain patency.

Is a nasal mask better mask for everyone? Based on extant studies addressing this topic, it is difficult to identify the patients in whom a nasal mask would definitely be preferable to an oronasal mask. Several of the studies suggesting an advantage of nasal masks over oronasal masks suffer from a conspicuous drawback, in that the patients in these studies were analyzed retrospectively. The reason/s why a patient was initiated on a specific kind of mask, or whether the patient had requested a change of mask due to discomfort or side effects, were not clearly elucidated. Furthermore, what percentage of patients using an oronasal mask would have a reduction in the required pressure or residual sleep disordered breathing when changed to a nasal mask—as noticed in the Ng et al. study—is not clear.

Several factors are generally considered while offering a certain style of mask to the patient, including patient preference, facial anatomy of the patient, facial hair, history of claustrophobia, patient report of oral breathing, and significant nose congestion. It seems likely, then, that in the absence of randomization, the patients using oronasal and nasal masks in a clinical setting are not necessarily comparable. Although a handful of randomized controlled trials (RCTs) exist,^{8,9} small samples sizes have limited interpretability. The compelling observational data presented in the Deshpande and Ng papers suggests the need for larger RCTs comparing pressure requirements across mask designs, including a nasal mask + chinstrap combination which might be associated with less frequent obstructions than an oronasal mask while still controlling mouth leak. Ideally, an RCT would also incorporate some anatomical measures.

Sleep medicine, like other medical fields, is leaning towards “precision medicine.”¹⁰ Voluminous databases minimize the risk of erroneous inferences and inappropriate recommendations. To facilitate development of such databases, astute record keeping is vital. Development of clinic note templates with discrete data fields will serve to enhance data homogeneity,

collection, communication, storage, retrieval and analyses. Such fields could include the factors that led the clinician to choose an oronasal versus nasal mask, such as chronic nasal congestion, septal deviation, patient report of predominantly oral breathing, or a history of comorbidities such as claustrophobia and anxiety. Particulars of facial anatomy that may also contribute to the response to a specific type of mask should be recorded. The creation and systematic analysis of such databases can help yield more valid and reliable inferences. An increasingly facile collection of data through mobile phones and wearable devices can further allow clinicians to determine sleep quality and daytime functioning while using a specific combination of CPAP device and interface.

One can conclude that the mask should be conceptualized not merely as a passive conduit transferring therapeutic pressure from the CPAP device to the patient, but as an active facilitator of adequate and appropriate therapy. The choice of mask should therefore be accorded the warranted time and attention. On the basis of the data presented in this issue of the *JCSM* and earlier studies, we suggest that nasal masks or nasal pillows should be strongly considered over oronasal masks in OSA patients unless there is a clear indication otherwise. Initiation of appropriate therapy for nasal congestion, if warranted, may facilitate tolerance of nasal masks. Finally, the data from Deshpande et al. and Ng et al. also emphasize the need for careful monitoring of residual obstructive events following a change of mask, which may signal the need for re-titration.

CITATION

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DISCLOSURE STATEMENT

The authors have indicated no financial conflicts of interest.