

Articles of the Month - October 2020

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Identifying the Appropriate Therapeutic Position of an Oral Appliance

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https://aadsm.org/journal/special_article_2_issue_74.php

EADSM comment:

Comprehensive up-to-date overview of the literature about the therapeutic mandibular position in patients with OSA treated with OA.

Patients with epiglottic collapse showed less severe obstructive sleep apnea and good response to treatment other than continuous positive airway pressure: a case-control study of 224 patients

Hee-Young Kim ¹, Chung-Man Sung ¹, Hye-Bin Jang ¹, Hong Chan Kim ¹, Sang Chul Lim ¹, Hyung Chae Yang ¹

Abstract

Study objectives: The purpose of this study was to analyze the patients with epiglottic collapse, especially their clinical characteristics related to obstructive sleep apnea (OSA) and phenotype labeling using drug-induced sleep endoscopy (DISE).

Methods: An age-sex matched case-control study was conducted to compare the clinical characteristics of patients with epiglottic collapse (Epi group) and patients without epiglottic collapse (Non-Epi group). All patients underwent DISE January 2015 - March 2019 in a tertiary hospital for suspected sleep apnea symptoms. Demographic factors, underlying disease, overnight polysomnography, and their phenotype labeling using DISE were analyzed.

Results: There was no difference in age, sex, the prevalence of hypertension, diabetes, cerebrovascular disease, and coronary artery disease. However, the body mass index (BMI) was significantly lower in patients in the Epi group ($p < 0.001$). Additionally, the apnea-hypopnea index was lower ($p = 0.001$), and the lowest oxygen saturation was significantly higher in the Epi group ($p = 0.042$). The phenotype labeling on DISE showed that the prevalence of velum concentric collapse and oropharyngeal lateral wall collapse was lower, and that of tongue base collapse was higher in the Epi group. Multi-level obstructions were more common in the Epi group. However, the Epi group showed a good response to mandibular advancement or positional therapy.

Conclusions: Although there was no difference in the underlying characteristics and subjective symptom scores between the groups, the patients with epiglottic collapse showed significantly lower BMI and OSA severity. Additionally, patients with epiglottic collapse were expected to respond well to oral devices or positional therapy.

EADSM comment:

Interesting study with results in accordance with what was mentioned in the Discussion in the study by Genta et al. (1) highlighting that non-CPAP therapies, such as OA, might be preferred over CPAP for patients with epiglottic collapse, because of poor tolerance to CPAP.

1. Genta PR, Sands SA, Butler JP, Loring SH, Katz ES, Demko BG, et al. Airflow Shape Is Associated With the Pharyngeal Structure Causing OSA. *Chest*. 2017;152(3):537-46.

Assessment of Screening for Nasal Obstruction among Sleep Dentistry Outpatients with Obstructive Sleep Apnea

Arisa Sawa¹, Hiroshi Suzuki¹, Hideo Niwa², Sumito Oguchi³, Tatsuo Yagi⁴, Yoshihiro Iwata¹, Yasuhide Makiyama², Chin Moi Chow^{5,6}, Osamu Komiyama¹ DOI: 10.3390/dj8040119

Abstract

Oral appliances (OA), a common treatment modality for obstructive sleep apnea (OSA), are not suitable for patients with nasal obstruction. Rhinomanometry, the gold standard technique to assess nasal airway resistance, is not readily available in sleep dentistry clinics. We demonstrate the use of a portable lightweight peak nasal inspiratory flow (PNIF) rate meter to objectively assess nasal airflow and utilized the Nasal Obstruction Symptom Evaluation (NOSE) scale to subjectively assess nasal obstruction in 97 patients with OSA and 105 healthy controls. We examined the correlations between the following variables between the groups: demographics, body mass index, PNIF, NOSE scale scores, apnea-hypopnea index (AHI), minimum SpO₂ (SpO₂min), Mallampati classification, and Epworth Sleepiness Scale (ESS) scores. Patients with OSA had significantly lower PNIF values and higher NOSE scores than controls. In the patient group, PNIF was not significantly correlated with AHI, SpO₂min, Mallampati classification, or NOSE or ESS scores. Lower PNIF values and higher NOSE scores suggested impaired nasal airflow in the OSA group. As daytime PNIF measurement bears no relationship to AHI, this cannot be used alone in predicting the suitability of treatment for OSA with OA but can be used as an adjunct for making clinical decisions.

EADSM comment:

Nose problems are not so often mentioned in relation to OA treatment. This article suggests some ways to further explore symptoms such as nasal congestion. Next page shows a little information about the NOSE questionnaire

Questionnaire

Good questionnaire for the dentist also?

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Otolaryngology-
Head and Neck Surgery
February 2004



Nasal Obstruction Symptom Evaluation (NOSE) Instrument



→ **To the Patient:** Please help us to better understand the impact of nasal obstruction on your quality of life by completing the following survey. Thank You!

Over the past 1 month, how much of a problem were the following conditions for you?

Please circle the most correct response

	<i>Not a problem</i>	<i>very mild problem</i>	<i>moderate problem</i>	<i>fairly bad problem</i>	<i>severe problem</i>
1. Nasal congestion or stuffiness	0	1	2	3	4
2. Nasal blockage or obstruction	0	1	2	3	4
3. Trouble breathing through my nose	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Unable to get enough air through my nose during exercise or exertion	0	1	2	3	4

European Respiratory Society Statement on Sleep Apnoea, Sleepiness and Driving Risk

Maria R Bonsignore^{1,2}, Winfried Randerath³, Sofia Schiza⁴, Johan Verbraecken⁵, Mark W Elliott⁶, Renata Riha⁷, Ferran Barbe^{8,9}, Izolde Bouloukaki⁴, Alessandra Castrogiovanni¹⁰, Oana Deleanu¹¹, Marta Goncalves¹², Damien Leger¹³, Oreste Marrone³, Thomas Penzel¹⁴, Silke Ryan¹⁵, Dan Smyth¹⁶, Joaquin Teran-Santos¹⁷, Cecilia Turino^{8,9}, Walter T McNicholas¹⁴ DOI: [10.1183/13993003.01272-2020](https://doi.org/10.1183/13993003.01272-2020)

Abstract

Obstructive sleep apnoea (OSA) is highly prevalent and is a recognised risk factor for motor vehicle accidents (MVA). Effective treatment with continuous positive airway pressure (CPAP) has been associated with a normalisation of this increased accident risk. Thus, many jurisdictions have introduced regulations restricting the ability of OSA patients from driving until effectively treated. However, uncertainty prevails regarding the relative importance of OSA severity determined by the apnoea-hypopnoea frequency per hour and the degree of sleepiness in determining accident risk. Furthermore, the identification of subjects at risk for OSA and/or accident risk remains elusive. The introduction of official European regulations regarding fitness to drive prompted the European Respiratory Society to establish a Task Force to address the topic of sleep apnoea, sleepiness and driving with a view to providing an overview to clinicians involved in treating patients with the disorder. The present report evaluates the epidemiology of MVA in patients with OSA, the mechanisms involved in this association, the role of screening questionnaires, driving simulators and other techniques to evaluate sleepiness and/or impaired vigilance, the impact of treatment on MVA risk in affected drivers, and highlights the evidence gaps regarding the identification of OSA patients at risk for MVA.

EADSM comment:

A welcome summary from the European Task Force about driving and OSA. The authors highlight the difficulties relying on AHI, which is poorly correlated to sleepiness and suggest ways forward to get more knowledge.

Mortality and morbidity in obstructive sleep apnoea-hypopnoea syndrome: results from a 30-year prospective cohort study

Sophie Dodds ¹, Linda J Williams ¹, Amber Roguski ¹, Marjorie Vennelle ¹, Neil J Douglas ¹, Serafeim-Chrysovalantis Kotoulas ¹, Renata L Riha ¹ DOI: 10.1183/23120541.00057-2020

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Background: Obstructive sleep apnoea-hypopnoea syndrome (OSAHS) carries substantial negative health consequences. This study examines factors affecting mortality and morbidity according to continuous positive airway pressure (CPAP) use and predictors affecting CPAP adherence in a longitudinal cohort of OSAHS patients.

Materials and methods: This prospective, cohort study comprised 4502 patients who were diagnosed with OSAHS at a tertiary sleep disorders centre between 1982 and 2003. Of these, 1174 patients completed follow-up in 2012. Data collected included anthropometric, sleep and demographic characteristics, including comorbidities, ongoing medications and CPAP adherence. Patients were followed up for an average of 14.8±3.7 years.

Results: Imputation analysis showed that long-term CPAP users (>5 years) were 5.63 times more likely to be alive at study end than non-CPAP users (95% CI: 4.83-6.58, p<0.001) and 1.74-times more likely than short-term CPAP users (≤5 years) (95% CI: 1.49-2.02, p<0.001). Females had a significantly higher mortality rate during the follow-up period (26.8% *versus* 19.6%, p<0.001). Respiratory mortality was more common in patients with OSAHS, in particular those who did not use CPAP, compared to the general population (17.2% *versus* 12.2%, p=0.002 respectively), whereas deaths from cancer were less common compared to the general population (16.2% *versus* 25.6%, p<0.001). Compared to CPAP users, non-CPAP-users had a significantly increased incidence of type II diabetes mellitus (DMII) (27.9% *versus* 18.7%, p=0.003), ischaemic heart disease (IHD) (25.5% *versus* 12.7%, p<0.001) and myocardial infarction (MI) (14.7% *versus* 4.2%, p<0.001) at long-term follow-up.

Conclusions: Long-term CPAP use in men and women with OSAHS reduces mortality and decreases the incidence of DMII and cardiovascular disease.

EADSM comment:

Encouraging data about reduced mortality with long-term CPAP use. 5 times as likely to be alive after an average of 15 years. It will be interesting to get data from OA-treatment in the future.

Influence of mandibular advancement on tongue dilatory movement during wakefulness and how this is related to oral appliance therapy outcome for obstructive sleep apnoea

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Abstract

Study objectives: To characterise how mandibular advancement splint (MAS) alters inspiratory tongue movement in people with obstructive sleep apnoea (OSA) during wakefulness and whether this is associated with MAS treatment outcome.

Methods: 87 untreated OSA participants (20 women, apnoea hypopnoea index (AHI) 7-102events/hr, aged 19-76years) underwent a 3T MRI with a MAS in situ. Mid-sagittal tagged images quantified inspiratory tongue movement with the mandible in a neutral position and advanced to 70% of the maximum. Movement was quantified with harmonic phase methods. Treatment outcome was determined after at least 9 weeks of therapy.

Results: 72 participants completed the study: 34 were responders (AHI<5 or AHI≤10events/hr with >50% reduction in AHI), 9 were partial responders (>50% reduction in AHI but AHI>10events/h), and 29 non-responders (change in AHI <50% and AHI ≥10events/rh). Sixty two percent (45/72) of participants had minimal inspiratory tongue movement (<1mm) in the neutral position, and this increased to 72% (52/72) after advancing the mandible. Mandibular advancement altered inspiratory tongue movement pattern for 40% (29/72) of participants. When tongue dilatory patterns altered with advancement, 80% (4/5) of those who changed to a counterproductive movement pattern (posterior movement >1mm) were non-responders, and 71% (5/7) of those who changed to beneficial (anterior movement >1mm) were partial or complete responders.

Conclusions: The mandibular advancement action on upper airway dilator muscles differs between individuals. When mandibular advancement alters inspiratory tongue movement, therapeutic response to MAS therapy was more common among those who convert to a beneficial movement pattern.

EADSM comment:

Studies about tongue behavior during treatment with a mandibular advancement splint seems to put interesting light on differences in patient response to treatment.