

## Articles of the Month – April 2021

### OSA and ageing

Link: <https://www.atsjournals.org/doi/pdf/10.1513/AnnalsATS.202007-771OC>

### Association of Obstructive Sleep Apnea with the Aging Process

Lucía Pinilla , Fernando Santamaria-Martos , Iván D Benítez , Andrea Zapater , Adriano Targa , Olga Mediano , Juan F Masa , Maria J Masdeu ; Olga Minguéz , Maria Aguilà , Ferran Barbé , Show All...

<https://doi.org/10.1513/AnnalsATS.202007-771OC> PubMed: 33662230

#### Abstract

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Rationale Evidence suggests that the physiopathological consequences of obstructive sleep apnea (OSA) resemble those induced by aging. Some studies report that the deleterious effects associated with OSA might be age dependent. Objectives The objectives of the study were to evaluate the association of OSA with the aging process and to determine whether this association is maintained across different age-groups. Methods Observational-prospective study including 599 patients with suspected OSA. Five hallmarks of aging were evaluated: alteration of cellular communication (serum C-reactive protein concentration), deregulation of nutrient sensing (insulin resistance), telomere attrition (leukocyte telomeric length), mitochondrial dysfunction (leukocyte mitochondrial mtDNA copy number) and genomic instability (urinary 8-hydroxy-2-deoxyguanosine concentration). For age-stratified analyses, subjects were divided into four groups according to the apnea-hypopnea index (AHI) and the median age (50 years): young non-OSA patients (age <50 years old, AHI <15 events/h), young OSA patients (age <50 years old, AHI ≥15 events/h), elderly non-OSA patients (age ≥50 years old, AHI <15 events/h) and elderly OSA patients (age ≥50 years old, AHI ≥15 events/h). Results A dose-response relationship was found between AHI, arousal index and night time with oxygen saturation less than 90%, and the following hallmarks: alteration of cellular communication, deregulation of nutrient sensing, mitochondrial dysfunction and genomic instability. Considering age-stratified analyses, OSA was associated with an increase in several hallmarks of aging in young patients, but no significant association of OSA was identified in elderly patients. Conclusions In subjects under 50 years of age, OSA is associated with an increase in specific hallmarks of aging, independent of several known confounding factors.

#### EADSM comment:

Interesting article that compares the physiopathological consequences of untreated OSA with the aging process, which supports the view of early treatment of the disease.

## OSA treatment effects on blood pressure

Meta-Analysis, Eur Respir J 2020 May 7;55(5):1901945.

doi: 10.1183/13993003.01945-2019. Print 2020 May.Link:

<https://erj.ersjournals.com/content/55/5/1901945.long>

### **Obstructive sleep apnoea treatment and blood pressure: which phenotypes predict a response? A systematic review and meta-analysis**

Martino F Pengo<sup>1</sup>, Davide Soranna<sup>1,2</sup>, Alice Giontella<sup>3,2</sup>, Elisa Perger<sup>1</sup>, Paola Mattaliano<sup>1</sup>, Esther Irene Schwarz<sup>4</sup>, Carolina Lombardi<sup>1</sup>, Grzegorz Bilo<sup>1</sup>, Antonella Zambon<sup>5</sup>, Joerg Steier<sup>6</sup>, Gianfranco Parati<sup>1,7</sup>, Pietro Minuz<sup>3</sup>, Cristiano Fava<sup>8</sup>

#### **Abstract**

The treatment for obstructive sleep apnoea (OSA) with continuous positive airway pressure (CPAP) or mandibular advancement devices (MADs) is associated with blood pressure (BP) reduction; however, the overall effect is modest. The aim of this systematic review and meta-analysis of randomised controlled trials (RCTs) comparing the effect of such treatments on BP was to identify subgroups of patients who respond best to treatment. The article search was performed in three different databases with specific search terms and selection criteria. From 2289 articles, we included 68 RCTs that compared CPAP or MADs with either passive or active treatment. When all the studies were pooled together, CPAP and MADs were associated with a mean BP reduction of -2.09 (95% CI -2.78- -1.40) mmHg for systolic BP and -1.92 (95% CI -2.40- -1.43) mmHg for diastolic BP and -1.27 (95% CI -2.34- -0.20) mmHg for systolic BP and -1.11 (95% CI -1.82- -0.41) mmHg for diastolic BP, respectively. The subgroups of patients who showed a greater response were those aged <60 years (systolic BP -2.93 mmHg), with uncontrolled BP at baseline (systolic BP -4.14 mmHg) and with severe oxygen desaturations (minimum arterial oxygen saturation measured by pulse oximetry <77%) at baseline (24-h systolic BP -7.57 mmHg). Although this meta-analysis shows that the expected reduction of BP by CPAP/MADs is modest, it identifies specific characteristics that may predict a pronounced benefit from CPAP in terms of BP control. These findings should be interpreted with caution; however, they are particularly important in identifying potential phenotypes associated with BP reduction in patients treated for OSA.

#### **EADSM comment:**

The most recent meta-analysis of blood pressure effects from CPAP and MAD treatments in OSA patients. Many more CPAP studies were found in this analysis. It was found that CPAP-treatment before 60 years of age was beneficial. It might therefore indirectly support MAD treatment, which is a more easily tolerated treatment in younger ages, when the disease often is in its early development. In accordance with the results from the previous article, these results favor early treatment of OSA.

## Adherence MAD

J Clin Sleep Med . 2021 Mar 4.

doi: 10.5664/jcsm.9184. Online ahead of print.

### **Factors influencing adherence to oral appliance therapy in adults with obstructive sleep apnea: a systematic review and meta-analysis**

Harishri Tallamraju<sup>1</sup>, J Tim Newton<sup>2</sup>, Padhraig S Fleming<sup>1</sup>, Ama Johal<sup>1</sup>

#### **Abstract**

**Study objectives:** The review aimed to identify the factors influencing adherence to oral appliance therapy (OAT) in adults with obstructive sleep apnea.

**Methods:** The protocol was initially registered with the International Register of Systematic Reviews (Prospero: CRD42019122615), prior to, undertaking a comprehensive electronic search of databases and references, without language and date restrictions. Quality assessment was undertaken using the Cochrane Collaboration's risk of bias tool and Quality in Prognosis Studies (QUIPS) tool.

**Results:** Studies exhibited low or unclear risk of bias for the domains assessed by the respective quality assessment tools. The influence of independent variables such as disease characteristics, patient characteristics, appliance features, psychological and social factors on adherence levels was also assessed. There were a total of 31 included studies, which consisted of: 8 RCTs, 2 CCTs, 7 prospective cohorts, 11 retrospective cohorts and the remaining three studies were a case-series, case-control and a mixed-methods. All 31 included studies were subject to qualitative analysis, with only 4 studies included in the quantitative analysis. Results of the meta-analysis demonstrated increased adherence with custom-made appliances, with a pooled mean difference of -1.34 (-2.02 to -0.66b) and low levels of heterogeneity ( $I^2 = 0\%$ ).

**Conclusions:** A weak relationship was observed between objective adherence and patient and disease characteristics such as age, sex, obesity, AHI, daytime sleepiness to oral appliance therapy. Non-adherent patients reported more side effects with oral appliance therapy than users and tended to discontinue the treatment within the first three months. Custom-made oral appliances were preferred and increased adherence reported in comparison to ready-made appliances. Further research is imperative in order to examine the relationship between psychosocial factors and adherence to oral appliance therapy.

**EADSM comment:** Good overview of factors related to adherence to MAD therapy, highlighting early side effects and read-made appliances as negative factors.

Eur J Orthod . 2021 Feb 8;cjaa084.

doi: 10.1093/ejo/cjaa084. Online ahead of print.

Link: <https://academic.oup.com/ejo/advance-article-abstract/doi/10.1093/ejo/cjaa084/6130848?redirectedFrom=fulltext>

## Adherence to oral appliance treatment and its determinants in obstructive sleep apnoea patients

Riitta Pahkala<sup>1</sup>, Anna Liisa Suominen<sup>2</sup>

### Abstract

**Background and objectives:** Treatment effectiveness, in terms of health benefits, is a composite of efficacy and adherence. Oral appliance (OA) usage is mainly based on self-reports, but nowadays, objective adherence monitoring for OAs is available. This study investigated the objective OA adherence and its determinants in obstructive sleep apnoea (OSA) patients.

**Materials and methods:** There were 29 subjects who were treated with OA; mean [SD] age 51.4 [11.1]; mean apnoea-hypopnoea index (AHI) [SD] 19.5 [10.0]. Anthropometric and sociodemographic parameters, AHI, daytime sleepiness, snoring, and adverse effects of OA as potential determinants were evaluated. Patients were classified as regular users if they wore OA at least 4 hours nightly 5-7 nights a week. Statistical analyses included the chi-square test, t-test, Mann-Whitney U-test, and linear regression analyses.

**Results:** At the 3-month follow-up, 68% of subjects were regular users and at 12-month follow-up, 64%. AHI, sociodemographic parameters, or adverse effects were not associated with OA adherence. Snoring seemed to improve weakly adherence, whereas mandibular retrusion reduced the weekly use, and smoking the nightly use of OAs.

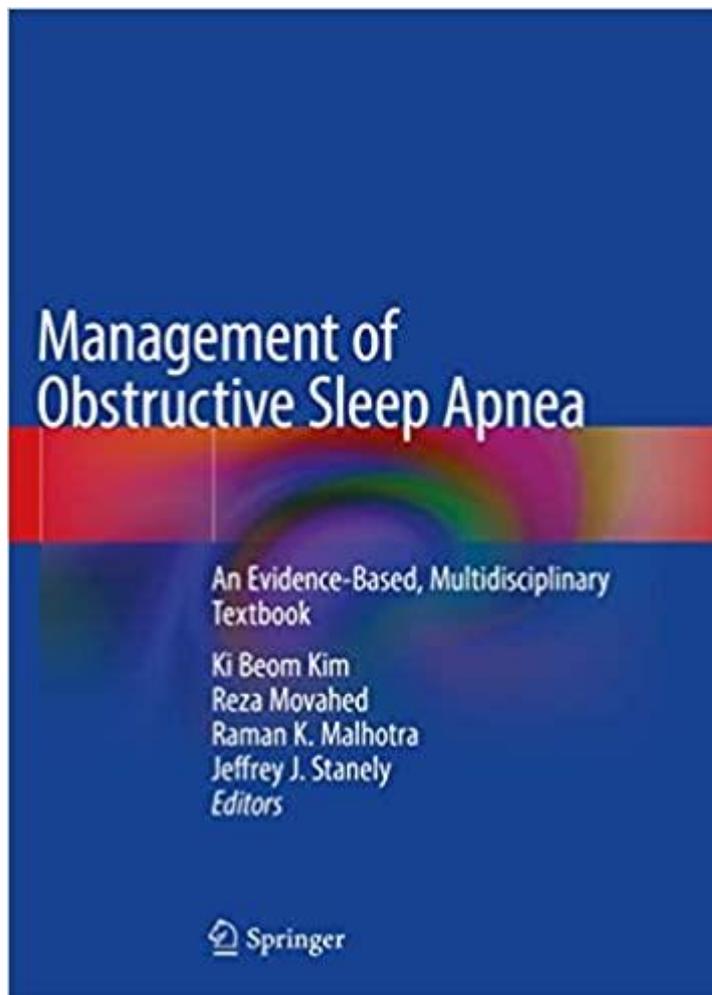
**Limitations:** The follow-up time was short, and there were a relatively small number of patients with obtainable adherence data, therefore it is difficult to establish if OA therapy alone is a successful long-term treatment option for OSA patients.

**Conclusions/implications:** Adherence to OA therapy is mainly the outcome of patients' subjective comfort in everyday life through eliminating social disturbance of snoring. To best meet a subject's individual treatment need and to prevent suboptimal use of OA, a patient-tailored therapy including digital wear-time documentation is recommended.

**EADSM comment:** Small study evaluating factors related to MAD adherence. It supports previous findings that patients are interested in reduced snoring. <sup>1</sup>

1. Dieltjens M, Verbruggen AE, Braem MJ, et al. Determinants of Objective Compliance During Oral Appliance Therapy in Patients With Sleep-Disordered Breathing: A Prospective Clinical Trial. *JAMA Otolaryngol Head Neck Surg.* 2015;141:894-900. 10.1001/jamaoto.2015.1756

New book



The whole book is available on Springer, but also single chapters (36 in total) in various topics e.g. classification, pathophysiology, diagnosis, health consequences and various treatments.

[Management of Obstructive Sleep Apnea - An Evidence-Based, Multidisciplinary Textbook | Ki Beom Kim | Springer](#)