Articles of the Months – June-July 2021

MAD

J Hypertens 2021 Jun 18.
doi: 10.1097/HJH.0000000000002914. Online ahead of print.

Link: Circadian blood pressure profile and blood pressure changes... : Journal of Hypertension (lww.com)

Circadian blood pressure profile and blood pressure changes following oral appliance therapy for obstructive sleep apnoea

Kate Sutherland[1], Hasthi U Dissanayake, Wojciech Trzepizur, Frederic Gagnadoux, Peter A Cistulli

Abstract

Objectives: Oral appliance therapy for obstructive sleep apnoea (OSA) reduces blood pressure (BP) but there is little information on relationship to circadian BP pattern (nocturnal BP dipping or non-dipping). The aims of this study were to determine whether nocturnal dipping pattern influences BP changes following oral appliance therapy, and to determine the effect of oral appliance therapy on circadian BP pattern.

Methods: Participants in two randomized trials of oral appliance therapy (1-2 months) with 24-h ambulatory BP monitoring (ABPM) data were included (N = 152). Nocturnal BP Dippers (nocturnal/diurnal SBP ratio <0.9) and non-dippers were compared for BP changes following oral appliance therapy and the effect of oral appliance therapy on nocturnal BP dipping was assessed.

Results: Of 152 participants, 64.5% were dippers. Dippers were on average younger and less likely to be hypertensive (42 vs. 82.7%, P < 0.001). Nondippers showed greater reduction in nocturnal BP measures, related to higher BP measures at baseline. There was no difference in the relationship between treatment effectiveness and BP changes between groups. Oral appliance therapy converted only 23% of baseline non-dippers to a nocturnal dipping profile.

Conclusion: Baseline circadian BP profile influenced the BP response to oral appliance therapy, largely because of higher baseline BP in the non-dipper subgroup. Oral appliance therapy did not convert OSA patients to a more favourable circadian BP profile. Further work is required to understand the effect of oral appliance therapy on circadian BP profile and of the individuals who will receive cardiovascular benefit from oral appliance therapy.

EADSM comment: Study indicating that CPAP is the best treatment for patients, who have important cardiovascular risk factors.

Int J Dent . 2021 Jun 17;2021:8811700.
doi: 10.1155/2021/8811700. eCollection 2021.

Free PMC article
Link: https://www.hindawi.com/journals/ijd/2021/8811700/

Efficacy of a Trial Oral Appliance in OSAS Management: A New Protocol to Recognize Responder/Nonresponder Patients

Marzia Segù [1], Alessia Cosi [1], Antonio Santagostini [1], Andrea Scribante [2]

Abstract

Oral appliances (OAs) of various types have shown variable success in the treatment of mild-to-moderate obstructive sleep apnoea (OSA). In an OSA sample, this study evaluated the efficacy of a diagnostic trial OA (myTAP™); the efficacy of a definitive custom-fitted mandibular advancement device (MAD) (SomnoDent Flex™); and whether a trial device can be used to distinguish treatment responder from nonresponder patients. Patients underwent overnight home sleep recordings prior to and after fitting of these appliances in order to objectively assess their sleep quality in terms of polysomnographic (PSG) respiratory measures: apnoea-hypopnoea index (AHI), oxygen desaturation index (ODI), and minimum oxygen saturation ($LowSpO_2$). 40 patients with symptomatic OSAS were enrolled, 33 males and 7 females, with a mean age of 55.6 ± 12.73 years and an initial (T0) AHI of 26.51 ± 14.79. Trial devices were used in 16 patients (AHI: 29.9 ± 19.97, ODI: 21.06 ± 16.05, and $LowSpO_2$: 82 ± 10.22 at T0) and definitive MADs in 28 (AHI: 23.90 ± 9.19, ODI: 16.27 ± 11.34, and $LowSpO_2$: 82.87 ± 6.04 at T0). Statistically significant decreases in AHI (9.59 ± 8.94, $p < 0.0023$) and ODI (8.20 ± 9.67, $p < 0.0129$) were observed after treatment with the trial device. Only 8 of the patients in the trial device group went on to use the definitive device. Treatment with the definitive MAD produced statistically significant decreases in AHI (11.46 ± 9.65, $p < 0.0001$) and ODI (9.10 ± 8.47, $p < 0.0016$) and a significant improvement in $LowSpO_2$ (85.09 ± 6.86, $p < 0.0004$). Thus, both types of device proved effective in improving the PSG parameters. This study showed that introducing an easy-to-make and low-cost trial device into the therapeutic pathway of OSAS patients can circumvent the problem of individual responses to treatment by allowing effective classification of patients: in short, it allows a first distinction to be drawn between responders and nonresponders to treatment.

EADSM comment: Although no strict evaluation of the benefit of a trial device was performed in this study, the study indicates that modern trial devices might be useful. More studies are therefore needed.

J Stomatol Oral Maxillofac Surg. 2021 Jun 9;S2468-7855(21)00125-7.
doi: 10.1016/j.jormas.2021.06.002. Online ahead of print.
Link: Clinical impact of two types of mandibular retention devices - A CAD/CAM design and a traditional design - On upper airway volume in obstructive sleep apnea patients - ScienceDirect

Clinical impact of two types of mandibular retention devices - A CAD/CAM design and a traditional design - On upper airway volume in obstructive sleep apnea patients

A Kerbrat [1], O Vinuesa [2], F Lavergne [3], E Aversenq [3], A Graml [4], J B Kerbrat [5], O Trost [6], P Goudot [7]

Abstract

Objective: This pilot randomized crossover study evaluated the outcomes of two custom-made mandibular retention devices (MRDs), a computer-aided design (CAD)/computer-aided manufacturing (CAM) device (Narval CC™) and a non-CAD/CAM device (Narval™), on oropharyngeal airway volume in patients with obstructive sleep apnoea (OSA).

Methods: 12 OSA patients were recruited from an University Hospital for MRD therapy with either CAD/CAM or non-CAD/CAM first. A cone-beam computed tomography evaluation (CBCT) and polysomnography assessment was performed during baseline assessment and at the end of each study period.

Results: Upper airway volume increased significantly with the CAD/CAM device (7725 +/- 6540 mm^3, p = 0.008) but not with the non-CAD/CAM device (3805 +/- 7806 mm^3, p = 0.13). The CAD/CAM device was also associated with a significant decrease in AHI (mean AHI after treatment 9.4±6.7 events/h, p = 0.003) and oxygen desaturation index (mean ODI of ≥ 3%/h 11.9 ± 6.8, p = 0.011). Changes in AHI (14.7 +/- 11.7 events/h, p = 0.083) and ODI (15.5 +/- 19.2, p = 0.074) were not statistically significant with the non-CAD/CAM device. The vertical dimension of occlusion increased significantly following treatment with both MRD devices (both p = 0.003), but was significantly less pronounced with the CAD/CAM device (mean difference: -2.7 +/- 1.7 mm, p = 0.003). Final mandibular protrusion after titration was the same with both devices (85%, p = 0.317).

Conclusion: The CAD/CAM (Narval CC™) device was associated with a significant increase in upper airway volume that may be caused by a lower degree of vertical separation between the jaws when compared to the non-CAD/CAM design.

EADSM comment: Another study highlighting the influence of device design on the results of OA-therapy.

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doi: 10.5664/jcsm.9308. Online ahead of print.

Mandibular advancement device use in obstructive sleep apnea: ORCADES study 5-year follow-up data

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Abstract

Study objectives: Mandibular advancement devices (MADs) are an alternative to continuous positive airway pressure (CPAP) for the management of obstructive sleep apnea (OSA). The ORCADES study is investigating the long-term effectiveness of MAD therapy in OSA patients who refused or were intolerant with CPAP. Five-year follow-up data are presented.

Methods: Data were available in 172/331 patients treated with a custom-made computer-aided design/computer-aided manufacturing bi-block MAD (Narval CC™; ResMed). The primary endpoint was treatment success (≥50% decrease in apnea-hypopnea index from baseline).

Results: Five-year treatment success rates were 52% overall, and 25%, 52% and 63%, respectively, in patients with mild, moderate or severe OSA. This reflects a decline over time versus 3-6 months (79% overall) and 2 years (68%). Rates declined in all patient subgroups, but to the greatest extent in mild OSA patients. The slight worsening of respiratory parameters over time was not associated with any relevant changes in sleepiness and symptoms. Moderate or severe OSA at baseline, treatment success at 3-6 months, and no previous CPAP use were significant independent predictors of 5-year treatment success on multivariate analysis. No new safety signals emerged during long-term follow-up. The proportion of patients using their MAD for ≥4 h/night on ≥4 days/week was 93.3%; 91.3% of patients reported device usage of ≥6 h/night at 5 years. At 5-year follow-up, 96.5% of patients reported that they wanted to continue MAD therapy.

Conclusions: Long-term MAD therapy remained effective after 5 years in >50% of patients, with good levels of patient satisfaction and adherence.

EADSM comment: This study highlights the need for strict long-term follow-up of patients undergoing OA-therapy. The big drop-outs rate in this study shows that much is unknown about what happens with patients who start OA-therapy and raise questions about the best care of these patients.

Clin Oral Investig. 2021 Jul 14.
doi: 10.1007/s00784-021-04064-7. Online ahead of print.

Link: Long-term dentoskeletal side effects of mandibular advancement therapy in patients with obstructive sleep apnea: data from the Pays de la Loire sleep cohort | SpringerLink

Long-term dentoskeletal side effects of mandibular advancement therapy in patients with obstructive sleep apnea: data from the Pays de la Loire sleep cohort

Nicolas Baldini[1], Frédéric Gagnadoux[2 3], Wojciech Trzepizur[2 3], Nicole Meslier[2 3], Julien Dugas[4], Chloé Gerves-Pinquie[4], Frédérique Chouet-Girard[5], Jean-Daniel Kün-Darbois[6 2]

Abstract

Objectives: Mandibular advancement devices (MADs) are the main therapeutic alternative to continuous positive airway pressure for obstructive sleep apnea. Our aim was to evaluate the long-term dentoskeletal side effects of MADs and to identify the predictive factors for these side effects.

Materials and methods: Patients from the Pays de la Loire cohort treated with a custom-made MAD for at least 1 year were included in this retrospective study. Digital cephalometric analyses were performed at baseline and at follow-up.

Results: We included a total of 117 patients, treated with a MAD for a median [interquartile range] of 4.6 [2.6-6.6] years. The main significant side effects were a decrease in overbite (- 0.5 ± 1 mm), overjet (- 0.7 ± 1 mm) and maxillary incisor inclination (- 2.5 ± 2.8°) and an increase in mandibular incisor inclination (+ 2.2 ± 2.7°). Subjective side effects were not linked to the observed dentoskeletal changes. Current smokers were at higher risk of overjet modifications. A pre-existing anterior open-bite was associated with a greater decrease in overbite. Treatment duration was associated with a more pronounced mandibular incisor proclination. Propulsion was negatively associated with maxillary incisor retroclination.

Conclusions: Long-term dentoskeletal side effects were mainly moderate dental side effects. Some predictive factors were shown to be associated with more pronounced changes. Subjective side effects did not appear to be reliable tools to detect dentoskeletal side effects.

Clinical relevance: Regular follow-up with clinical examination and regular radiographs is mandatory. The predictive factors could be of interest for a better selection of patients and to individualize follow-up.

EADSM comment: A confirmation of previous findings of dento-skeletal side-effects that often develop during OA-therapy.

CPAP

Sleep Breath. 2021 Jun;25(2):887-895.
doi: 10.1007/s11325-020-02197-9. Epub 2020 Oct 4.

Link: [Low arousal threshold is associated with unfavorable shift of PAP compliance over time in patients with OSA | SpringerLink]

Low arousal threshold is associated with unfavorable shift of PAP compliance over time in patients with OSA

Hao Wu[1], Fang Fang[2 3], Chan Wu[2], Xiaojun Zhan[2], Yongxiang Wei[4]

Abstract

Purpose: To determine the predictive factors of initial and long-term adherence to positive airway pressure (PAP) therapy and factors leading to an unfavorable shift of PAP compliance.

Methods: This follow-up study was comprised of newly diagnosed patients with obstructive sleep apnea (OSA) amenable to PAP therapy from January 2017 to April 2019. Information on basic demographics, comorbidities, and sleep-related symptoms were collected. PAP adherence data were collected at the end of the first week and the third month.

Results: Of 166 patients enrolled, data from 142 (86%) were in the final analysis. Overall PAP usage was worse at 3 months declining from the first week. After adjusting for age and gender, multinomial logistic regression analysis showed that a small number of sleep-related symptoms (OR, 0.69; 95% CI, 0.52-0.91) and low arousal threshold (ArTH) (OR, 4.44; 95% CI, 1.52-12.98) were associated with higher odds of noncompliance. Low ArTH (OR, 2.87; 95% CI, 1.09-7.57) and lower body mass index (BMI) (OR, 0.88; 95% CI, 0.78-0.99) increased the risk of compliance-to-noncompliance shift. Sixty-two patients with polysomnography were analyzed separately. After adjustment for age and gender, poor sleep efficiency (OR, 0.80; 95% CI, 0.68-0.94) was associated with higher odds of consistent noncompliance. Low ArTH (OR, 15.36; 95% CI, 1.44-164.24) increased the risk of compliance-to-noncompliance shift in this subgroup.

Conclusions: Lower BMI and low ArTH were associated with an unfavorable shift of PAP compliance over time in patients with OSA, which was different from the predictors of consistent PAP noncompliance of patients with OSA.

EADSM comment: Patients with a low arousal threshold and poor sleep efficiency were more likely to become non-adherent to CPAP treatment than those without those traits. It would be interesting to evaluate these factors also among MAD-treated patients.