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Short Communication

State of art of Oral Appliance to Treat Sleep Apnoea

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Obstructive sleep apnoea (OSA) is an evaluative pathology that may affect men, women, and children alike, and because of this, regardless of the age of onset, treatment is very important. OSA is a life-threatening disorder, and its consequences may lead to cardiovascular diseases, type I diabetes, metabolic syndrome, sexual dysfunction, mood alterations, depression, anxiety, neurocognitive alteration, and others pathologies that compromise overall health and quality of life.

Snoring, excessive daytime somnolence, non-restorative sleep, tiredness at awakening, fatigue, and memory lapses may be symptoms of OSA. Early diagnosis and treatment is essential for good prognosis [1].

Dentists who have rigorous training in sleep medicine and/or sleep-related breathing disorders with focused emphasis on proper diagnostic protocols, treatment, and follow up can treat snoring and OSA by using an oral appliance (OA) a device that moves the mandible forward and increases upper airway dimensions in order to reduce/eliminate respiratory events.

OA is a viable and effective option for OSA treatment. It is the first choice of treatment for snoring and mild-to-moderate OSA and the second option to treat severe OSA, when patients do not accept or cannot tolerate continuous positive airway pressure (CPAP) [2].

The efficacy and safety of OA therapy to treat OSA has already been shown in past studies and now, these devices are widely used and required by patients for all OSA severity types. Although CPAP is considered the gold standard therapy for OSA, oral devices are preferred by patients [3,4].

Randomized studies have shown that CPAP can be tolerated by approximately 30–40% of users, while 76–84% prefer to use OA [3,4]. This preference exists because the oral device is more comfortable, quiet, and cost-effective for selected apnoeic patients.

Many studies have shown OA efficacy based on both objective parameters such as apnoea/hypopnoea index, oxygen saturation, arousal index, sleep architecture, blood pressure, heart rate variability, and subjective parameters such as cognitive, sleepiness, and quality of life tests [4-7]. Some types of OAs that do not advance the jaw have been suggested for OSA treatment, but there are no randomized controlled trials to prove their real effectiveness [8].

Decrease on diastolic and systolic pressure were observed in OA users, even when evaluated after 3 years of treatment [9-11], and one study showed that some aspects of nocturnal blood pressure were improved with OA but not with CPAP [4]. Other studies showed early signs of health alteration and evaluated the autonomic nervous activity by heart rate variability analysis, which showed an improvement after OA therapy [12,13].

Studies comparing OA with CPAP have shown that both were effective on cardiovascular function. A recent systematic review showed that compared to CPAP, OAs have a beneficial effect on blood pressure, endothelial function, and left ventricular function. However, the effects of OA on cardiovascular comorbidities were similar to that of the effect of CPAP therapy [14].

A previous cohort study evaluated the cardiovascular mortality in severe OSA treated with OA and CPAP, and an important point in this study was that patients who used oral devices were those who did not tolerate CPAP. Although there is the presence of residual apnoea events with OA therapy, this study showed that both therapies were equally effective in reducing the risk of fatal cardiovascular events in patients with severe OSA [15].

Similar outcome with CPAP and OA treatment may be explained by greater compliance relative to OA even with CPAP being more efficient in reducing respiratory events. Previous studies have shown that it is possible to measure the objective OA compliance using a microsensor thermometer. This allows calculating the mean disease alleviation as the product of objective compliance and therapeutic efficacy. Same authors also reported that there was high agreement between objective and self-reported compliance [16,17].

Another study showed that OA could be used as a short-term alternative treatment to CPAP, during travel or vacationing, when CPAP cannot be used. According to these authors, respiratory events were partially or totally reduced in severe OSA treated with oral device, and there was no significant difference between OA and CPAP with respect to the quality of life; however, the daytime sleepiness was lower with OA than with CPAP [18].

Recent studies have more convincing evidence for the efficacy of OA therapy in severe OSA, and have shown that oral devices could be offered to severe OSA population instead of leaving them untreated.

Considering that OSA is an evaluative disease and patients with severe OSA are at a high risk of fatal cardiovascular events, would it be safe to deny OA treatment for those who refuse CPAP? All these recent studies may answer this question by showing that important health alterations can be alleviated by using an oral device.

Despite all the recent scientific data available to sleep-disorder professionals, many patients with severe OSA remain untreated, because they refuse CPAP and no other therapy is prescribed to them.

It is important that health professionals be aware that OA is a safe and viable scientific-based treatment option to every severity of OSA, even when patients cannot tolerate or refuse CPAP therapy.

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Dentists with specialized training in dental sleep medicine are important members of the team dealing with sleep disorders, and they, together with other sleep-medicine professionals, should form collaborative efforts to provide the best treatment for OSA patients by respecting their limitation and choice.

However, we can conclude that more randomized controlled trials are needed in order to more clearly define patients characteristics indicated for OA therapy, acceptance, success, and compliance. Further research on cost-effectiveness of therapy and to clarify the best design characteristics most beneficial to specific patients groups would also be helpful to clinicians.

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