



REVIEW ARTICLE

Systematic review: the influence of nasal obstruction on sleep apnea[☆]



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KEYWORDS

Nasal obstruction;
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Sleep fragmentation;
Polysomnography;
Treatment outcome

Abstract

Introduction: Obstructive sleep apnea syndrome (OSAS) is a common disorder that can lead to cardiovascular morbidity and mortality, as well as to metabolic, neurological, and behavioral consequences. It is currently believed that nasal obstruction compromises the quality of sleep when it results in breathing disorders and fragmentation of sleep. However, recent studies have failed to objectively associate sleep quality and nasal obstruction.

Objective: The aim of this systematic review is to evaluate the influence of nasal obstruction on OSAS and polysomnographic indices associated with respiratory events.

Methods: Eleven original articles published from 2003 to 2013 were selected, which addressed surgical and non-surgical treatment for nasal obstruction, performing polysomnography type 1 before and after the intervention.

Results/conclusions: In most trials, nasal obstruction was not related to the apnea-hypopnea index (AHI), indicating no improvement in OSAS with reduction in nasal resistance. However, few researchers evaluated other polysomnography indices, such as the arousal index and rapid eye movement (REM) sleep percentage. These could change with nasal obstruction, since it is possible that the nasal obstruction does not completely block the upper airways, but can increase negative intrathoracic pressure, leading to sleep fragmentation.

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PALAVRAS-CHAVE

Obstrução nasal;
Apneia obstrutiva do sono;
Fragmentação do sono;
Polissonografia;
Resultado do tratamento

Revisão sistemática: influência da obstrução nasal na apneia do sono**Resumo**

Introdução: A síndrome da apneia obstrutiva do sono (SAOS) é um distúrbio muito prevalente que pode ocasionar morbi-mortalidade cardiovascular, além de consequências metabólicas, neurológicas e comportamentais. Atualmente, acredita-se que a obstrução nasal comprometa a qualidade do sono, devido a distúrbios respiratórios e fragmentação do sono. Entretanto, até o momento estudos recentes não conseguem relacionar objetivamente qualidade do sono e obstrução nasal.

Objetivo: O objetivo principal desta revisão sistemática é avaliar a influência da obstrução nasal na SAOS e em índices polissonográficos associados a eventos respiratórios.

Método: Foram selecionados um total de 11 artigos originais de 2003 a 2013 com tratamentos cirúrgicos e não cirúrgicos da obstrução nasal, realizando a polissonografia do tipo 1 antes e após a intervenção.

Resultados/conclusões: Na maioria dos ensaios, a obstrução nasal não se relacionou ao índice de apneia-hipopneia, indicando ausência de melhora da SAOS com a redução da resistência nasal. Entretanto, poucos pesquisadores avaliaram índices polissonográficos como o índice de despertares e o percentual do sono REM (movimento rápido dos olhos) que poderiam vir alterados, uma vez que a obstrução nasal possivelmente não obstrui completamente a via aérea superior, mas aumenta a pressão negativa intratorácica, levando à fragmentação do sono.

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Introduction

Obstructive sleep apnea syndrome (OSAS) is a very prevalent disorder, which may result in cardiovascular morbidity and mortality, as well as metabolic, neurological, and behavioral consequences. In the Brazilian population, this syndrome is a public health problem, affecting 32.8% of the population.¹ OSAS is an anatomical and functional abnormality resulting from partial or total neuromuscular collapse of the upper airways (UA) during sleep, mainly with negative pressures during inspiration. This obstruction causes sleep fragmentation and intermittent hypoxia. The main areas of obstruction are the nose, palate, and tongue, but the obstruction may be multifactorial.² Currently, it is believed that nasal obstruction impairs the quality of sleep in respiratory disorders, and also adversely affects the adoption and adherence to continuous positive airway pressure (CPAP), the gold standard for OSAS treatment.³ However, recent studies have failed to objectively associate the quality of sleep with nasal obstruction.⁴

According to the European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS 2012), nasal obstruction can be caused by several types of chronic (CRS) or acute rhinosinusitis.⁵ Some studies suggest that sleep complaints in patients with CRS are common and can even affect their quality of life, but there is little information about this association.⁶ The last review on the subject, carried out in 2013 by Meen et al., showed that drug and surgical nasal interventions did not improve the apnea-hypopnea index (AHI), or OSAS, but improved subjective symptoms of the disorder, such as excessive daytime sleepiness and quality of life.⁴ This and other more recent systematic reviews, however, did not evaluate the arousal index, RERA (respiratory

effort-related arousals), and the sleep-disordered breathing index.

The main objective of this systematic review was to evaluate the influence of nasal obstruction on OSAS and other polysomnography indices associated with respiratory events, over the last decade.

Methods

Articles selected were prospective studies, consisting of controlled clinical trials, and cohort studies, in which patients underwent type 1 polysomnography (supervised by the technician in the sleep laboratory), performed as a complete overnight study before and after conservative or surgical interventions to improve nasal breathing during sleep. Two reviewers selected the relevant literature published between 2003 and 2013 from MEDLINE (BIREME and PubMed), in English or Portuguese languages, on the association between nasal obstruction and OSAS. Related articles and references were also included in this review. Only original studies with surgical and non-surgical treatment of nasal obstruction that performed type 1 polysomnography before and after the intervention were selected. The following were excluded: letters to the Editor, case series (with less than ten patients), review articles, basic research studies, and studies without intervention or without type 1 polysomnography performed throughout the entire night. Studies that included patients with neuropathy, heart disease, age <18 years, and multilevel surgery or other non-nasal surgeries at the same time were also excluded.

The assessed interventions were: use of medications (nasal decongestants and topical corticosteroids), nasal dilators, and nasal surgeries (rhinoplasty, septoplasty with or

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