

The Relationship Between Sleep Apnea and Cluster Headaches

Cluster headaches are characterized by their tendency to occur at night, due to their association with periods of rapid eye movement during sleep. Issues with breathing at night, such as sleep apnea, are sometimes considered to be triggers for episodes of cluster headaches, lasting anywhere from fifteen minutes to three hours. Many researchers have reported that cluster headaches originate from the brain's hypothalamus, the portion of the brain that controls the autonomic nervous system. The dysfunction stemming from the hypothalamus may impair the activity of chemical receptors in the brain, leading to both sleep apnea and cluster headaches.

In one study examining cluster headaches, six out of ten patients had been diagnosed with sleep apnea as well. Another study showed that out of thirty-one patients with cluster headaches, eighty percent of them had signs of sleep apnea and snoring. Some patients have found relief from their cluster headaches by treating their sleep apnea, although this approach does not always work, and the cluster headaches stay.

The study suggests that there is a relationship between the metabolic control of the body and airway regulation, meaning there is most likely a link between the two disorders. Research suggests that low oxygen levels during an apnea event are triggers for cluster headaches, which makes sense when the fact that oxygen can stop a cluster headache is considered. As stated before, treatments for sleep apnea are not always the key to treating cluster headaches, so while they may be parallel, the two disorders may not be related after all. Even if a patient's sleep apnea is under control through the use of an oral appliance or the continuous positive airway pressure machine, their cluster headaches may still remain.

Graff-Radford, S.B., Newman, A. (2004). "Obstructive Sleep Apnea and Cluster Headache" The Pain Center at Cedars Sinai Medical Center.



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How Commonly Diagnosed are Sleep Disorders?

Sleep disorder awareness is steadily increasing, but not at a fast enough rate. At any given time, about 30% of the population is affected by a sleep disorder, and many of those people either are not aware of their affliction, or have not been correctly diagnosed. Sleep disorders affect cognitive function, performance at work, and overall emotional behavior. Sleep disturbances accompany most medical and psychiatric disorders, adding to the patient's general distress. Certain sleep disorders, such as sleep apnea, leave the patient at an increased risk for developing other physical and psychiatric illnesses.



Obstructive sleep apnea (OSA) has a well-defined basis in medical disorders, although only about 10% of those with the disorder are actually diagnosed. Sleep disorders can exacerbate preexisting medical conditions, and OSA specifically can worsen a patient's epilepsy, hypertension, and leave them predisposed to cardiac failure. The unfamiliarity of the public and professionals leads to the widespread misinterpretation of sleep disorders, causing a delay of adequate diagnosis or treatment for the patient.

The fragmentation of sleep due to sleep apnea will likely cause tiredness, fatigue, irritability, reduced concentration, hindered performance at work or school, or depression in patients who remain undiagnosed. The patient's physician or family members can oftentimes misjudge excessive sleepiness as laziness, lack of motivation, or an overall loss of interest.

In young children, sleeplessness caused by pediatric sleep apnea can cause hyperactivity, leading to the misdiagnosis of attention deficit hyperactivity disorder. The child is then prescribed stimulating drugs, which further aggravate his or her sleep disorder.

Only a fraction of those with obstructive sleep apnea actually seek medical advice, mostly because they do not know they even have the disorder. Many people who seek medical advice do so for the side effects of sleep apnea, such as hypertension, fatigue, mood swings, instead of sleep apnea itself. Therefore, while the other symptoms of the patient are treated, the patient's sleep apnea, the underlying problem, continues to run its course.

Stores, G. (2007). "Clinical Diagnosis and Misdiagnosis of Sleep Disorders" J Neurol Neurosur Psychiatry, Vol. 78 pp. 1293-1297.



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About Obstructive Sleep Apnea

Obstructive sleep apnea is characterized by repetitive pharyngeal collapse during sleep, which causes the patient to repeatedly awake throughout the night. Recent data shows connections between neurological and cardiovascular conditions that could potentially be caused by obstructive sleep apnea in an individual. To regulate their breathing, patients suffering from sleep apnea will recurrently be aroused from sleep, causing their sleep to be fragmented. Sleep is such an important function of the human body, and lack of adequate sleep can lead to systemic hypertension, myocardial infarction, cerebrovascular events, and even congestive heart failure.

The risk factors for those who could have sleep apnea are obesity, of the male gender, and increasing age. Obesity is present in over 70% of cases of sleep apnea due to compromised function of their respiratory system, along with more weight pulling down and shrinking the patient's airways. Men are more likely to develop sleep apnea than women, and there are five men for every woman diagnosed with the disorder. Social habits such as smoking cigarettes, which affect the upper airway,

and drinking alcohol, which suppresses the pharyngeal dilator muscle, determine whether an individual is more likely to develop sleep apnea.

The most common form of treatment for sleep apnea is CPAP therapy, which is extremely effective with patients who have severe sleep apnea. For other patients who do not suffer from such severe sleep apnea, CPAP adherence is low because of the size, noise, and discomfort with the machine. While CPAP is more effective in treating severe cases, Oral Appliance Therapy (OAT) is excellent in treating mild to moderate cases of sleep apnea. According to a study in which groups of patients used CPAP and OAT, more patients were compliant with the oral appliance, and more patients stopped using the CPAP machine. Oral appliances are preferred by patients to CPAP therapy, and should be considered for those who fail or refuse to use the machine. A spectrum for sleep apnea, as opposed to an abrupt categorization method, will allow patients to get the best treatment that is specific to their needs.

Malhotra, A & White, DP. (2002). "Obstructive Sleep Apnoea" The Lancet, Vol. 360 pp. 237-245.



Oral Appliances for Obstructive Sleep Apnea

Oral appliances have arisen in the sleep medicine field as viable alternatives to continuous positive airway pressure (CPAP) therapy. An oral appliance is a custom-fitted device that reduces upper airway collapse by advancing the patient's mandible, allowing the patient to breathe easier through the night. Overwhelming evidence shows that oral appliance therapy (OAT) can improve obstructive sleep apnea in many patients, even some who have more severe degrees of sleep apnea. Oral appliances are generally well-tolerated, especially when compared to the amount of people who tolerate CPAP. The use of a CPAP machine is considered superior in reducing OSA in patients, however not many people are CPAP compliant, and adherence is very low.

There are various forms of oral appliances, all of which manipulate the jaw in different ways. The most popular is the mandibular advancement device, but others such as mandibular advancement splints and mandibular repositioning appliances are also in use. Oral appliances prevent the collapse of the airways by altering the position of the patient's tongue and jaw. The doctor uniquely fits oral appliances to the patient's mouth through the use of dental casts and precise customization. There also exist thermoplastic oral appliances, which are molded by biting down on a hot mouth guard like device and then cooled. The efficacy of the thermoplastic devices is much lower than that of the custom-fitted device, the former of the two having lower treatment success and adherence. A large majority of patients tested with both forms of oral appliances preferred and continued to use the custom fitted appliance.

The use of oral appliances has become one of the industries first lines of treatment in mild and moderate cases of sleep apnea, after the American Academy of Sleep Medicine did extensive research into their usage. Oral appliances are even helpful and improve the patient's condition in more severe cases, specifically those in which the patient rejects CPAP therapy.

The side effects from using oral appliances include excessive salivation, mouth dryness, tooth pain, and gum irritation, however these usually alleviate themselves after around two months. Some patients experience negligible occlusal changes, although sometimes patients report an improvement in their bite.

While both CPAP therapy and oral appliance therapy work well, there are clear differences between the two. CPAP may have the best overall relief statistics, but less people actually continue to use CPAP after a year. Oral appliance therapy is better at alleviating oxygen desaturation in patients, and there is little difference in the effects each one has on blood pressure. When used in combination, oral appliances become a useful complement to CPAP therapy compared to the CPAP machine on its own. The usage of oral appliances throughout dental medicine is on the rise because of how effective it is, as well as how many more people actually learning about its benefits.

Sutherland, K., Vanderveken, O.M., Tsuda, H., Marklund, M., Gagnadoux, F., Kushida, C.A., Cistulli, P.A., (2013) "Oral Appliance Treatment for Obstructive Sleep Apnea: An Update" *Journal of Clinical Sleep Medicine*. Vol. 10 pp. 215-227.

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