

Comparison between continuous positive airway pressure vs. uvulopalatopharyngoplasty in treatment of obstructive sleep apnea in adult males

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Abstract. Introduction: Obstructive Sleep Apnea (OSA) is a condition characterized by repeated cessation of breathing throughout sleep. This lack of breathing can occur anywhere from 5-50 times in one hour and can last for ten seconds or longer. This is usually caused by an obstruction in the airway, nose or throat. This condition affects about 4% of the adult male population. People at risk include those that are male, older than thirty years, have family history of condition, certain ethnicities such as Hispanics and African Americans, loss or weak muscle tone in throat or tongue, medical conditions that cause abnormalities of head or face and those going through menopause. Treatments or therapy for OSA are widely available and include Continuous Positive Airway Pressure (CPAP) and uvulopalatopharyngoplasty (UPPP). **Methodology:** An evidence-based systemic literature review was completed acquiring studies regarding CPAP and UPPP in the treatment of obstructive sleep apnea in adult males. Medline and Eco were searched for articles that met the defined inclusion criteria. Inclusion criteria were as follow: treatment of OSA with either CPAP or UPPP, dated 1981-2006, include adult males in the study, and have data pertaining to apnea index (AI), apnea/hypopnea index (AHI). Patients were considered successful if their AHI, AI, or RDI (apnea and hypopneas) was decreased by $\geq 50\%$ or if the end result was < 20 AHI, AI, or RDI episodes per hour of sleep. **Results:** Forty-seven articles matched the criteria. These articles proved success of CPAP and mixed success/failure for UPPP. **Conclusion:** The most effective and successful treatment for obstructive sleep apnea in adult males is CPAP with a grade B recommendation. UPPP is recommended as second line therapy.

1. Introduction

Obstructive Sleep Apnea (OSA) is a condition characterized by repeated cessation of breathing throughout sleep referred to as apneic episodes. This lack of breathing can occur anywhere from 5-50 times in one hour and can last for ten seconds or longer. This is usually caused by an obstruction in the airway, nose or throat. Signs of OSA include: extreme snoring, excessive daytime sleepiness, falling asleep at awkward times such as while driving or eating, extreme turning while asleep and waking numerous times at night while trying to catch breath. This condition affects about 4% of the adult male population [1]. People at risk include those that are male, older than thirty years, have family history of condition, certain ethnicities such as Hispanics and African Americans, loss or weak muscle tone in throat or tongue, medical conditions that cause abnormalities of head or face and those going through menopause. Some risk factors that may be altered to lessen the likelihood of being diagnosed with this condition include smoking, obesity, use of alcohol and certain sleeping patterns. OSA causes blood oxygen to decrease. If this condition is not treated it could lead to hypertension, depression, abnormalities in heart rate or rhythm, coronary artery disease, pulmonary hypertension or even heart failure. People with OSA have a higher risk of car accidents, poor work ability, stress, anxiety and may find it hard to concentrate. Treatments or therapy for OSA are widely available. These include from simply avoiding alcohol or losing weight to dental appliances, tonsillectomies, Continuous Positive Airway Pressure (CPAP) and uvulopalatopharyngoplasty (UPPP). CPAP was introduced in 1981 by Sullivan et al [2]. CPAP maintains patency to the airway during sleep. This is done by a mask applied to the nose which provides positive airway pressure to the airway. This treatment must be used every night or symptoms are likely to return. Uvulopalatopharyngoplasty is the most common surgical treatment for OSA in adults and was introduced by Fujita and coworkers in 1981 [3]. UPPP removes tissue from the soft palate, uvula, and posterior lateral pharyngeal wall in order to enlarge the airway. This reduction in tissue eliminates the obstruction of airway during sleep. Surgery is often chosen if the patients are unresponsive to CPAP

treatment, unable to use the CPAP machine, have excessive tissue blocking airway or those who wish not to have a tracheostomy. Uvulopalatopharyngoplasty has been previously reported to have a success rate of 50-70%. CPAP has been shown to be 100% effective if used correctly. Disappointing success rates seems to be the result of inadequate patient selection. Difference in effectiveness of treatment also seems to depend on position of sleep such as supine vs. lateral. There is no clear correlation between success and age, gender, BMI and level of obstruction.

2. Experiment, Results, Discussion, and Significance

The purpose of this paper was to perform an evidence-based systematic review of the literature and examine the data in order to provide the answer to how CPAP compares to UPPP in the treatment of OSA. Medline and Eco were searched using the following key terms: continuous positive airway pressure, CPAP, uvulopalatopharyngoplasty, UPPP, obstructive sleep apnea, OSA, and adult males. Articles used included data relevant to treatment outcomes of CPAP or UPPP on OSA in adult males during the years from 1981-2006. Criteria included AHI(apnea/hypopnea index), AI(apnea index) or RDI(apnea and hypopneas) information. Patients were considered successful if their AHI, AI, or RDI was decreased by $\geq 50\%$ or if the end result was < 20 AHI, AI, or RDI episodes per hour of sleep. The study was considered successful if at least 50% of the patients were a success. Forty-seven articles matched the criteria and were reviewed using evidence-based methods. These articles proved the success of CPAP and the mixed success/failure for UPPP. Data showed that therapy with CPAP was more reliable in successfully decreasing apnea/hypopnea episodes. Data for UPPP showed mixed results. Eleven articles were included that contained data on CPAP treatment for OSA. These articles all showed that CPAP is an effective and successful treatment. Forty-two articles were included that had information regarding the use of UPPP in the treatment of OSA. Twenty-eight (66.7%) of these articles found UPPP to be successful and fourteen (33.3%) of the articles found UPPP to be unsuccessful.

3. Conclusions

In conclusion, studies involving continuous positive airway pressure all show success whereas the studies found involving uvulopalatopharyngoplasty have mixed results. These mixed results seem to rely on patient factors such as pre-op apnea/hypopnea index, weight, sex, age, and degree of obstruction. It is important to realize that every patient will be different and not fall under all categories. This is why treatment plans need to be adjusted to fit the individual patient. Patients need to be aware of all risks and benefits of both treatment options. Patients also need to be informed that if surgery is not successful that treatment may be referred back to CPAP. After careful analysis of these 47 studies a grade B recommendation can be given for the use of CPAP followed by a grade B for the use of UPPP in the treatment of obstructive sleep apnea in adult males. CPAP is the preferred first line treatment and only after careful consideration should UPPP be utilized.

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