Original Research

Assessment of mandibular advancement device and alternate therapy in the management of obstructive sleep apnea

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ABSTRACT:
Background: Sleep apnea is a sleep disorder characterized by pauses in breathing or instances of shallow or infrequent breathing during sleep. The present study was conducted to assess mandibular advancement device and alternate therapy in the management of obstructive sleep apnea. **Materials & Methods:** 70 patients of obstructive sleep apnea of both genders were divided into 2 groups of 35 each. Group I patients were given mandibular advancement device (MAD) and group II was assigned yoga and pranayamas. STOP-Bang, PSQI, and Epworth Sleepiness Scale questionnaires were used as diagnostic tools to screen for sleep apnea. **Results:** Group I had 20 males and 15 females and group II had 18 males and 17 females. The mean PSQI score in group I was before treatment was 15.4 and after was 11.2, in group II before was 14.7 and after was 10.3. The mean STOP-BANG before treatment was 4.8 in group I and 4.2 in group II and after treatment was 3.5 in group I and 2.1 in group II. The mean EPWORTH before treatment was 7.9 in group I and 7.4 in group II and after treatment was 6.4 in group I and 4.2 in group II. **Conclusion:** MAD offers an inexpensive, comfortable treatment option for patients requiring immediate relief but has poor appliance compliance.
Key words: Sleep apnea, hypopnea, Snoring

INTRODUCTION

Sleep apnea is a sleep disorder characterized by pauses in breathing or instances of shallow or infrequent breathing during sleep. Each pause in breathing, called apnea, can last from at least 10 seconds to several minutes and may occur 5 to 30 times or more in an hour.[1] Obstructive sleep apnea (OSA), a condition characterized by repeated episodes of apnea and hypopnea during sleep, is a common disorder. OSA is expected to be associated with an increased likelihood of hypertension, cardiovascular disease, stroke, daytime sleepiness, motor vehicle accidents, and diminished quality of life.[2]

There are several different treatment options available for OSA and selecting the best treatment for an individual is not always straightforward. OSA is a heterogeneous condition and symptom burden correlates poorly with objective measures of severity obtained from sleep studies.[3] At the extremes, patients with severe OSA can be asymptomatic, whereas others with only mild disease can suffer debilitating daytime sleepiness. It can therefore be difficult to predict which patients will benefit from treatment.[4]
Mandibular advancement devices are proven to be efficient in treating mild-to-moderate sleep apnea and snoring.[5] Yoga encompasses a wide range of practices, including physical exercises, breath exercises,

meditation exercises, and relaxation exercises.[6] The present study was conducted to assess mandibular advancement device and alternate therapy in the management of obstructive sleep apnea.

MATERIALS & METHODS

The present study consisted of 70 patients of obstructive sleep apnea of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 35 each. Group I patients were given mandibular advancement device (MAD) and group II was assigned yoga and pranayamas. All patients were subjected to digital lateral cephalography in an upright position. Radiographs were taken according to the specifications of the Kodak 8000C machine. STOP-Bang, PSQI, and Epworth Sleepiness Scale questionnaires were used as diagnostic tools to screen for sleep apnea. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

| Groups	Group I	Group II
Method	MAD	Yoga+ pranayamas
M:F	20:15	18:17

Table I shows that group I had 20 males and 15 females and group II had 18 males and 17 females.

Table II Assessment of parameters

Parameters	Variables	Group I	Group II	P value
PSQI	Before	15.4	14.7	0.04
	After	11.2	10.3	
STOP-BANG	Before	4.8	4.2	0.02
	After	3.5	2.1	
EPWORTH	Before	7.9	7.4	0.01
	After	6.4	4.2	

Table II, graph I shows that mean PSQI score in group I was before treatment was 15.4 and after was 11.2, in group II before was 14.7 and after was 10.3. The mean STOP-BANG before treatment was 4.8 in group I and 4.2 in group II and after treatment was 3.5 in group I and 2.1 in group II. The mean EPWORTH before treatment was 7.9 in group I and 7.4 in group II and after treatment was 6.4 in group I and 4.2 in group II. The difference was significant (P< 0.05).

Graph I Assessment of parameters
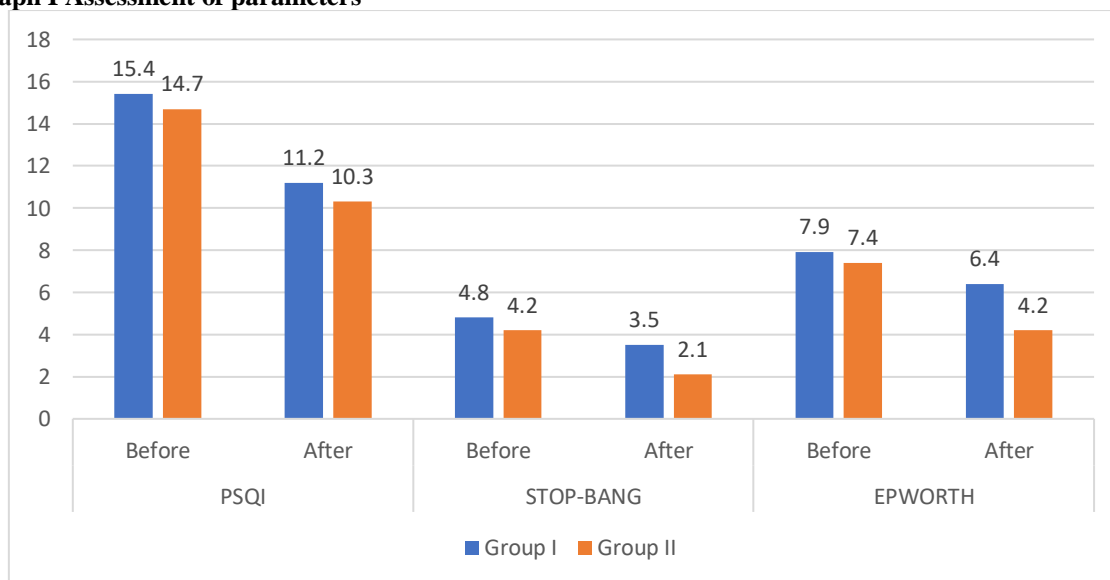
DISCUSSION

Sleep and sleepiness are among the most basic of human behaviors.[7] Snoring is the turbulent sound of air moving through the back of the mouth, nose, and throat.[8,9] Snoring not only causes appreciable inconvenience to the snorer's partners, but may also have serious health implications exacerbated by anatomical abnormalities, obesity, or excessive alcohol consumption.[10,11] OSA is an increasingly prevalent disease with a considerable social burden with the pathophysiology based on the interaction of multiple factors and that is far more common than

generally believed.[12,13] The present study was conducted to assess mandibular advancement device and alternate therapy in the management of obstructive sleep apnea.

We found that group I had 20 males and 15 females and group II had 18 males and 17 females. Daga et al[14] evaluated the quality of sleep before and after the use of the appliance and while practicing yoga based on the STOP-BANG questionnaire for sleep quality, Pittsburgh Sleep Quality Index (PSQI), and Epworth Sleepiness Scale (ESS). A total of 100 patients visiting the outpatient department (OPD) were divided into two groups of 50 each. The first group who fulfilled the criteria for the device was given a mandibular advancement device (MAD) and the second group was assigned yoga and pranayamas. The first group showed a significant increase in the airway space on lateral cephalogram also with more immediate overall scores in all three questionnaires compared to the second group.

We found that mean PSQI score in group I was before treatment was 15.4 and after was 11.2, in group II before was 14.7 and after was 10.3. The mean STOP-BANG before treatment was 4.8 in group I and 4.2 in group II and after treatment was 3.5 in group I and 2.1 in group II. The mean EPWORTH before treatment was 7.9 in group I and 7.4 in group II and after treatment was 6.4 in group I and 4.2 in group II. Rose et al[15] in their study included 26 patients with a polysomnographic diagnosis of mild OSA [22 men, four women; mean body mass index 27.3 kg/m2 (SD 3.1); mean age 56.8 years (SD 5.2); mean respiratory disturbance index (RDI): 16.0 events/hour (SD 4.4)]. After insertion of the first MAA and a 6-8-week habituation period, a cardio-respiratory home-sleep study was carried out. Following a 2-3-week period with no treatment, the second appliance was inserted. The sequence of the devices was randomized. Once the patients had become accustomed to the second appliance, another somnographic registration was carried out. Daytime sleepiness, snoring, and sleep quality were assessed subjectively on a visual analogue scale. The results showed that a statistically significant improvement in the respiratory parameters was achieved with both appliances ($P < 0.01$). However, the activator [RDI: 5.5 events/hour, SD 3.3; apnoea index (AI): 3.4 events/hour, SD 2.1] was significantly more effective ($P < 0.01$) than the Silencor (RDI, 7.3 events/hour, SD 5.3; AI: 5.8 events/hour, SD 3.2). No difference was recorded in the subjective assessment of the therapeutic effects. Both appliances reduced daytime sleepiness and snoring and improved sleep quality, and both influenced the treatment outcome.

Satoshi et al[16] investigated the morphological characteristics of patients with OSA and the basis for selection of an oral appliance (OA) therapy, the craniofacial skeleton, soft tissue, and upper airway. The results showed the narrowing in the hypopharynx due to the inferior located hyoid bone, especially in the obese group, an enlarged tongue and sticking of fatty tissue to the upper airway wall were observed in addition. These findings proved that the morphological characteristics were specific to patients with OSA and patients who were allowed to accept OA therapy.

Khalsa et al[17] with 20 participants by a 1-hour hath-yoga treatment training session and subsequent follow-ups by telephone, usually less than 15 min in duration, every 2 weeks, or more frequently reported statistically significant improvements in most of the important subjective sleep measures.

The limitation the study is small sample size.

CONCLUSION
Authors found that MAD offers an inexpensive, comfortable treatment option for patients requiring immediate relief but has poor appliance compliance.

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