

## Original Research

### To assess role of Orthodontics in management of OSA patients

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#### ABSTRACT:

**Background:** Obstructive sleep apnea (OSA) is a sleep-associated disorder of breathing with a reduction or complete airflow obstruction despite an ongoing effort by patient for breathing. The present study was conducted to assess role of Orthodontics in management of OSA patients. **Materials & Methods:** The present study was conducted on 64 patients diagnosed of OSA of both genders. Patients was prescribed with Continuous Positive Airway Pressure (CPAP) management. The upper airway was measured using Lyberg et al.'s method. All patients were given mandibular advancement appliance. Pre treatment and post treatment airway was compared. **Results:** Out of 64 patients, males were 34 and females were 30. The mean pre treatment nasopharyngeal airway space was 28.4 mm and post treatment space was 25.1 mm, oropharyngeal space was 11.5 mm and post pharyngeal space was 9.4 mm, hypopharyngeal space was 9.8 mm and post pharyngeal space was 17.2 mm. The difference was significant ( $P < 0.05$ ). The clinical features in patients was snoring in 34, bruxism in 36, obesity in 12, fatigue in 45, mouth breathing in 38, neck hyperextension in 17 and waling during sleep in 11 patients. The difference was significant ( $P < 0.05$ ). **Conclusion:** Authors concluded that mandibular advancement appliance is sufficient in management of patients with OSA.

**Key words:-** mandibular advancement appliance, Continuous Positive Airway Pressure, Obstructive sleep apnea.

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#### INTRODUCTION

Obstructive sleep apnea (OSA) is a sleep-associated disorder of breathing with a reduction or complete airflow obstruction despite an ongoing effort by patient for breathing. It usually occurs during sleep, muscles undergoes relaxation and causes collapse of the soft tissues present in the back of the throat which leads to upper airway blockage.<sup>1</sup> Consequently, there are partial and complete pauses in breathing that last at least 10 seconds during sleep. Then, blood oxygen saturation, with oxygen levels decreases abruptly and falls 50% or more in severe cases. The brain shows response when there is less oxygen and alerts the body which causes a brief arousal from sleep. This restores normal pattern of breathing. This pattern can occur hundred times in one night. This results a

fragmentation in sleep quality and produces an excessive sleepiness during daytime.<sup>2</sup>

The gold standard for diagnosing sleep apnea is through polysomnography (PSG). A polysomnography (PSG) is an overnight sleep study attended by a sleep technologist during which measures at least seven different physiological signals.<sup>3</sup> According to the American Academy of Sleep Medicine, a diagnosis of OSAS can be made in the presence of five or more episodes of apnea/hypopnea per hour of sleep, accompanied by clinical symptoms (such as daytime sleepiness, mood disorder, insomnia, and hypertension) or at least 15 events per hour without additional symptoms. The severity of OSAS is differentiated based on Apnea Hypopnea Index (AHI) as mild when characterised by 5-15 events per hour, moderate in the presence of up

to 30 events per hour, and severe when more than 30 events per hour.<sup>4</sup> The present study was conducted to assess role of Orthodontics in management of OSA patients.

**MATERIALS & METHODS**

The present study was conducted in the department of Orthodontics. It comprised of 64 patients diagnosed of OSA of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

General data such as name, age, gender etc. was recorded. A thorough oral examination was performed. Patients was prescribed with Continuous Positive Airway Pressure (CPAP) management. The upper airway was measured using Lyberg et al.'s method. All patients were given mandibular advancement appliance. Pre treatment and post treatment airway was compared. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant (P< 0.05).

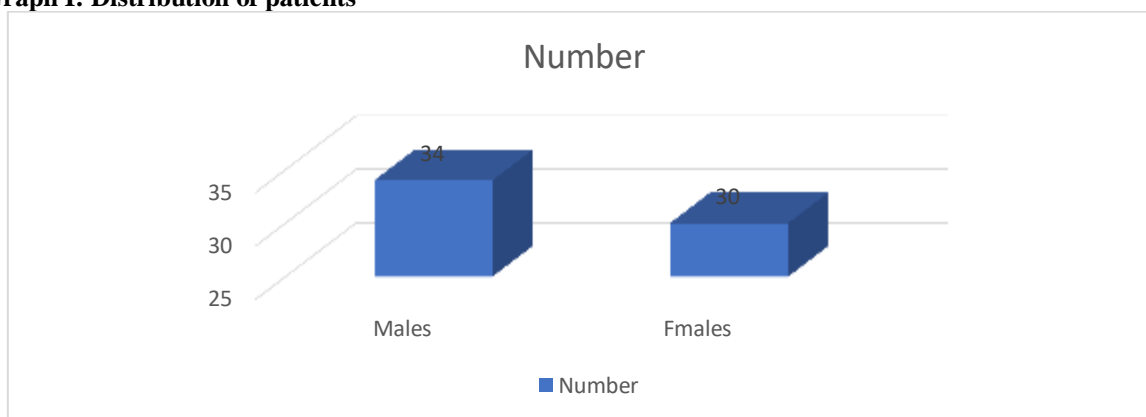
**RESULTS**

**Table I Distribution of patients**

Total- 64		
Gender	Males	Females
Number	34	30

Table I, graph I shows that out of 64 patients, males were 34 and females were 30.

**Graph I: Distribution of patients**

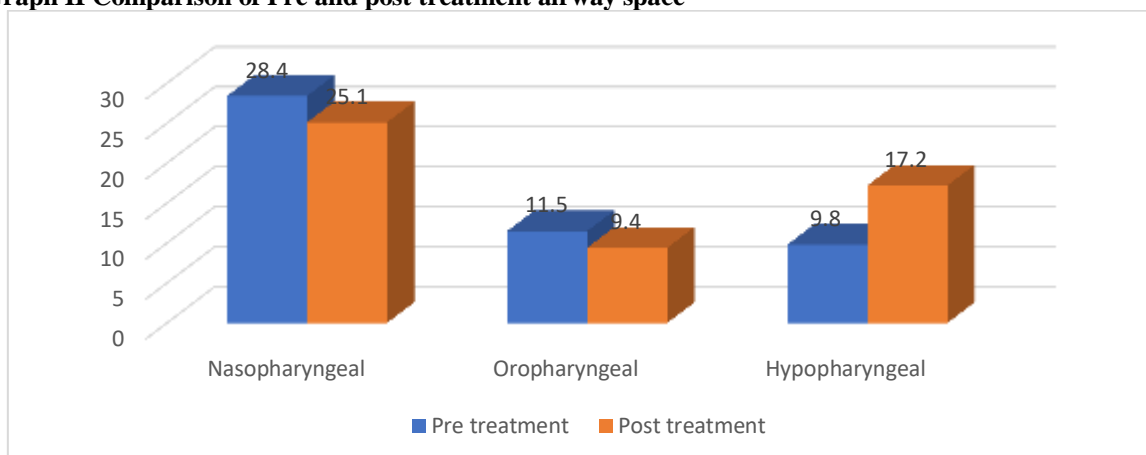


**Table II Comparison of Pre and post treatment airway space**

Airway (mm)	Pre treatment	Post treatment	P value
Nasopharyngeal	28.4	25.1	0.05
Oropharyngeal	11.5	9.4	0.01
Hypopharyngeal	9.8	17.2	0.001

Table II, graph II shows that mean pre treatment nasopharyngeal airway space was 28.4 mm and post treatment space was 25.1 mm, oropharyngeal space was 11.5 mm and post pharyngeal space was 9.4 mm, hypopharyngeal space was 9.8 mm and post pharyngeal space was 17.2 mm. The difference was significant (P< 0.05).

**Graph II Comparison of Pre and post treatment airway space**



**Table II Clinical features in patients**

Clinical features	Number	P value
Snoring	34	0.05
Bruxism	36	
Obesity	12	
Fatigue	45	
Mouth breathing	38	
Neck hyperextension	17	
Walking during sleep	11	

Table III shows that clinical features in patients was snoring in 34, bruxism in 36, obesity in 12, fatigue in 45, mouth breathing in 38, neck hyperextension in 17 and waling during sleep in 11 patients. The difference was significant ( $P < 0.05$ ).

**DISCUSSION**

Snoring, although ubiquitous in the adult population, is considered abnormal in children and adolescents.<sup>1</sup> More importantly, it may serve as an indicator of a more severe respiratory problem that presents as a continuum, from primary snoring to obstructive sleep apnoea (OSA). Reports vary on the prevalence of OSA, ranging from 0.7% to 5% of the population under 18 years old. Moreover, breathing-induced sleep disorders have been proven to have a profound effect on the child’s behaviour, growth and development;<sup>5</sup> the myriad of symptoms include: morning tension-type headaches, excessive morning thirst, excessive fatigue and sleepiness, abnormal shyness, withdrawn and depressive presentation, pattern of attention-deficit/hyperactivity disorder, memory impairments, aggressiveness and irritability, among many others.<sup>6</sup> The present study was conducted to assess role of Orthodontics in management of OSA patients.

In present study, out of 64 patients, males were 34 and females were 30. Polysomnography records patterns of sleeping and breathing together.<sup>7</sup> PSG is performed overnight at a sleep centre with the help of a technician and a standard PSG typically consists of EEG, electromyogram, electro-oculogram, respiratory airflow, thoraco-abdominal movement and oxygen saturation tracings (oximetry). Polysomnography requires about 30-60 min set up time before sleep and about 30 minutes detachment time in the morning. Staff should be present for at least ten hours overnight to perform and monitor this test.<sup>8</sup>

We found that mean pre-treatment nasopharyngeal airway space was 28.4 mm and post treatment space was 25.1 mm, oropharyngeal space was 11.5 mm and post pharyngeal space was 9.4 mm, hypopharyngeal space was 9.8 mm and post pharyngeal space was 17.2 mm.

Makhbul et al<sup>9</sup> reported a case of obstructive sleep apnea managed with combination of orthodontic treatment and orthognathic surgery. A 36-year-old overweight (BMI 27.6) male, known case of obstructive sleep apnea with apnea hypopnea index (AHI) of 14.5 presented with a Class II division 1 malocclusion on a Class II skeletal base. The upper arch was well aligned but there was moderate

crowding in the lower arch. The dentition was complicated by a 7.0mm overjet. The pre-surgical orthodontics aligned the upper and lower arches, decompensated the occlusion resulting in further increase in overjet. The orthognathic surgical procedure was performed to advance the mandible under general anaesthesia. Post-operative outcome showed significant improvement of the patient’s condition and the AHI was reduced to 1.1. Cephalometric airway space measurement showed improvement.

We found that clinical features in patients was snoring in 34, bruxism in 36, obesity in 12, fatigue in 45, mouth breathing in 38, neck hyperextension in 17 and waling during sleep in 11 patients. Continuous positive airway pressure (CPAP): CPAP is the treatment option for moderate to severe cases of OSA. A continuous positive airway pressure machine is a new device with a mask that fits snugly over the nose of patient. It transmits a continuous flow of air and keeps the throat open throughout the night. Continuous positive airway pressure (CPAP) functions like a pneumatic splint and keeps the airway patent during sleep breathing. It works by means of a flow generator that delivers positive pressure through air tube to a nasal mask worn by the patient. This generation of airflow keeps the airway open and prevents pauses in breathing and restores normal oxygen levels. Newer CPAP devices are quite small, light and available with different mask sizes to achieve a good fit. Major side effects of CPAP are significant epistaxis, paranasal sinusitis but they are rare.<sup>10</sup>

**CONCLUSION**

Authors concluded that mandibular advancement appliance is sufficient in management of patients with OSA.

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