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Original Research

Efficacy of a Karwetzky activator in Obstructive Sleep Apnea in children

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ABSTRACT:
Children with Obstructive Sleep Apnea (OSA) have sleep-disordered breathing (SDR) that interferes with their sleep habits, growth, and development. OSA is characterized by partial or total obstruction of the upper airways (UA) during sleep. The purpose of the current study was to evaluate a Karwetzky activator's effectiveness in treating juvenile OSA patients. **Materials & Methods:** Children with Obstructive Sleep Apnea (OSA) have sleep-disordered breathing (SDR) that interferes with their sleep habits, growth, and development. OSA is characterized by partial or total obstruction of the upper airways (UA) during sleep. The purpose of the current study was to evaluate a Karwetzky activator's effectiveness in treating juvenile OSA patients. **Results:** Of the 54 patients, 24 were boys and 30 were girls. The average Apnea-hypopnea index was 17.4 events per hour at T0, 4.2 events per hour at T1, 8.1 events per hour at T2, and 8.3 events per hour at T3. At T0, T1, T2, and T3, the apnea index was 8.4, 1.4, 3.2, and 4.6 events/hour, respectively. At T0, T1, T2, and T3, the mean oxygen saturation was 94.2, 93.1, 93.5, and 94.1%, in that order. At T0, T1, T2, and T3, the minimal oxygen saturation percentages were 79.2, 83.4, 79.5, and 80.6, respectively. At T0, T1, T2, and T3, the minimal oxygen saturation percentages were 79.2, 83.4, 79.5, and 80.6, respectively. At T0, T1, T2, and T3, the oxygen desaturation index was 13.2, 5.4, 9.4, and 9.2, respectively. At T0, T1, T2, and T3, the percentage of rapid eye movement sleep was 13.7, 14.2, 14.8, and 15.2, respectively. At T0, T1, T2, and T3, the percentage of sleep in the supine posture was 42.3, 47.5, 39.4, and 45.2, respectively. There was a substantial difference ($P<0.05$). C**onclusion:** Authors found that Karwetzky activator is useful in management of mild-to-moderate OSA.
Key words: Karwetzky activator, Obstructive Sleep Apnea, Sleep.

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INTRODUCTION

Children with Obstructive Sleep Apnea (OSA) have sleep disordered breathing (SDR) that interferes with their growth and development and disrupts their sleep patterns due to partial or total obstruction of the upper airways (UA) during sleep.[1] Surgery to remove lymphoid tissue is the gold standard of care for children. Recurrence of the disease is possible and is thought to be caused by a variety of factors, including associated craniofacial issues.[2] AHI ≥ 1.0 or a pattern of obstructive hypoventilation, defined as at least 25% of total sleep time with hypercapnia ($PaCO2 > 50$ mm Hg) in conjunction with snoring, flattening of the nasal pressure

waveform, or paradoxical respiratory efforts, are the criteria for pediatric obstructive sleep apnea, according to the international classification of sleep disorders.[3] The Polysomnography Exam (PSG) is considered the gold standard for diagnosis, expressed by the apnea and hypopnea index (AIH), classified according to the number of occurrences per hour of sleep: the diagnosis is confirmed when the AHI is higher.[4] The diagnostic criteria that apply to children differ from those that apply to adults and are still being developed. PSG and clinical research have demonstrated the short-term therapeutic benefit of OAs in multiple investigations. Only a small number of lengthy follow-up studies, meanwhile, have been supported by control PSG and show that treatment efficacy endures. As OSA typically necessitates lifetime treatment, long-term monitoring is critical.[5] The present study was conducted to assess the role of efficacy of a Karwetzky activator in pediatric patients with OSA.

MATERIALS & METHODS

Modes:

The department of Pedodontics and Orthodontics carried out the current investigation. There were 54 OSA patients in all, both male and female. The institutional ethical committee gave its approval for the project. Children's parents were notified about the study and given their approval.

Names, ages, genders, and other details were recorded. Based on polysomnography, patients with mild-to-moderate OSA were diagnosed. The Karwetzky activator was used on patients with obstructive sleep apnea (OSA). They were successfully treated at first using this device. Additional polysomnographic registrations were performed six to twelve weeks (T1), six to twelve months (T2) and eighteen to twenty-four months (T3) following the initiation of treatment for each patient wearing the appliance. The department of Pedodontics and Orthodontics carried out the current investigation. Information like name, age , gender and so forth were noted. Patients with mild to moderate OSA were diagonosed based on polysomnography. For individuals suffering from obstructive sleep apnea(OSA),the Karwetzky activator was administered. This gadget was initially used to treat them with success. For every patient wearing the appliance, additional polysomnographic registrations were carried out 6 to 12 weeks (T1), 6 to 12 months (T2) and 18 to 24 months (T3) after the start of treatment. After tabulating the results, statistical analysis was performed . AP value of less than 0.05 was deemed noteworthy.

RESULTS

Table I : Distribution of patients

Total- 54		
Gender	**Boys**	**Girls**
Number	24	30

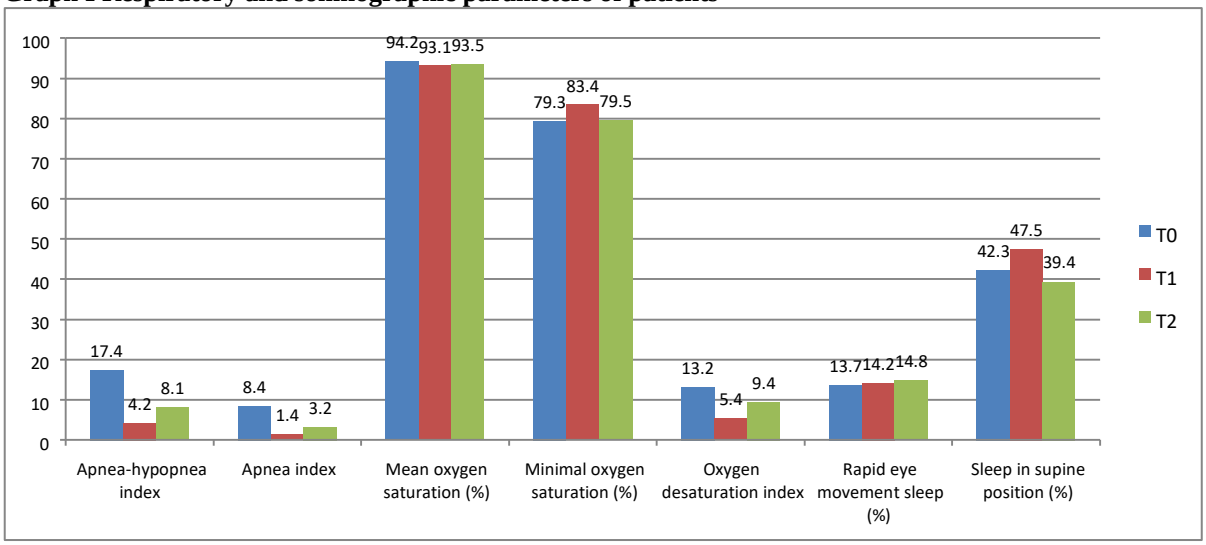
Table I shows that out of 54 patients, boys were 24 and girls were 30.

Table II Respiratory and somnographic parameters of patients

Variables	T0	T1	T2	T3	P value
Apnea-hypopnea index	17.4	4.2	8.1	8.3	0.01
Apnea index	8.4	1.4	3.2	4.6	0.02
Mean oxygen saturation (%)	94.2	93.1	93.5	94.1	0.82
Minimal oxygen saturation (%)	79.3	83.4	79.5	80.6	0.94
Oxygen desaturation index	13.2	5.4	9.4	9.2	0.05
Rapid eye movement sleep (%)	13.7	14.2	14.8	15.2	0.72
Sleep in supine position (%)	42.3	47.5	39.4	45.2	0.92

Table II, graph I shows that mean Apnea-hypopnea index at T0 was 17.4 events/hour, at T1 was 4.2 events/hour, at T2 was 8.1 events/hour and at T3 was 8.3 events/hour. Apnea index was 8.4, 1.4, 3.2 and 4.6 events/hour at T0, T1, T2 and T3 respectively. Mean oxygen saturation was 94.2, 93.1, 93.5 and 94.1% at T0, T1, T2 and T3 respectively. Minimal oxygen saturation (%) was 79.2, 83.4, 79.5 and 80.6 at T0, T1, T2 and T3 respectively. Oxygen desaturation index was 13.2, 5.4, 9.4 and 9.2 at T0, T1, T2 and T3 respectively. Rapid eye movement sleep (%) was 13.7, 14.2, 14.8 and 15.2 at T0, T1, T2 and T3 respectively. Sleep in supine position (%) was 42.3, 47.5, 39.4 and 45.2 at T0, T1, T2 and T3 respectively. The difference was significant ($P< 0.05$).

Graph I Respiratory and somnographic parameters of patients



DISCUSSION

Numerous studies recommend that other diagnostic methods and instruments, like parent reports, clinical exams, behavioral and cognitive information questionnaires, and 3D imaging investigations, be taken into accounts.[6] The primary risk factor for the condition is recognized to be adenotonsillar hypertrophy, which is followed by obesity, neuromuscular conditions, and craniofacial abnormalities.[7] For youngsters, removing the oropharyngeal lymphoid tissue is the gold standard of care. Treatment in childhood is thought to be essential; failing to recognize this at an early age could have a detrimental impact on the quality of their adult life.[8] The most popular non-surgical therapy options are air pressure devices (CPAP or BPAP), although these are pricy and not well-liked by kids.[9]After an adenotonsillectomy, the clinical condition may recur, and concurrent craniofacial issues are thought to be one of the causes. The orthodontist can identify and correct these changes with ease. Dental skeletal abnormalities may result from or be made worse by the persistence of OB and PS during the growing and developmental stage.

In this study we found that out of 54 patients, boys were 24 and girls were 30. Rose *et al.*[11]discovered that during 6 to 12 weeks of treatment, the mean apnea-hypopnea index considerably dropped, from 17.8 occurrences per hour at baseline registration to 4.2 events per hour (P <.001). The apnea hypopnea index was 8.2 occurrences per hour after six to twelve months. Eight three incidents per hour was the index's degree of stability eighteen to twenty-four months later. The activator did not increase mean oxygen saturation, but at the 6-to 12-week assessment, there were fewer desaturations. Once too, the improvement reduced over time, although at 18 to 24 months (P <.01), the number of oxygen desaturations was still much lower. Throughout the trial, there was no statistically significant change in sleep architecture, despite the respiratory metrics continuing to improve (P <.01). At the 2-year follow-up, most patients' therapeutic efficacy was still present, albeit there was a trend for it to wane with time. 17.4 events per hour, 4.2 events per hour at T1, 8.1 events per hour at T2, and 8.3 events per hour at T3. At T0, T1, T2, and T3, the apnea index was 8.4, 1.4, 3.2, and 4.6 events/hour, respectively. At T0, T1, T2, and T3, the mean oxygen saturation was 94.2, 93.1, 93.5, and 94.1%, in that order. At T0, T1, T2, and T3, the minimal oxygen saturation percentages were 79.2, 83.4, 79.5, and 80.6, respectively. At T0, T1, T2, and T3, the oxygen desaturation index was 13.2, 5.4, 9.4, and 9.2, respectively. At T0, T1, T2, and T3, the percentage of rapid eye movement sleep was 13.7, 14.2, 14.8, and 15.2, respectively. At T0, T1, T2, and T3, the percentage of sleepers in the supine position was 42.3, 47.5, 39.4, and 45.2, respectively. Villa *et al.*[12] 32 children, 20 boys and 12 girls, with an average age of 7.1 ± 2.6 years, who had malocclusion, an AHI >1 incident per hour, and OSA symptoms were examined for the clinical application and tolerance of FA. 19 patients (SG) with an AHI of 6 were chosen at random, and they used the FA. The remaining patients made up the CG. The polysomnography test revealed that the CG showed no change following the treatment, whereas the SG experienced a significant reduction in the AHI when compared to the same index at the start of the intervention. When clinical symptoms were compared before and after using the device, 7 out of 14 participants had their respiratory symptoms score drop by 2 points, and 7 of them had their primary complaints resolved. The shortcoming of the study is small sample size.

CONCLUSION

Authors found that Karwetzky activator is useful in management of mild-to-moderate OSA.

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