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An Observational Study on the Treatment Outcomes of Adenotonsillar Hypertrophy in Children

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Abstract **Original Research Article**

Background: Adenotonsillar hypertrophy, marked by abnormal enlargement of the adenoids and tonsils, is common in children and can cause various health issues. For severe cases, surgical intervention, mainly adenotonsillectomy, is often recommended and has proven effective in improving airway obstruction, sleep quality, and overall health outcomes. This study aimed to assess the treatment Outcomes of adenotonsillar hypertrophy in children. ***Methods:*** This prospective observational study was conducted in the Department of Head & Neck Surgery (ENT), Dhaka National Medical Institute Hospital, Dhaka, Bangladesh from January 2023 to June 2023. A total of 57 children with primary symptoms of mouth breathing, snoring, and sleep disturbances were purposively enrolled as study subjects. For data analysis, MS Office tools were applied. ***Results*:** Most participants (61.4%) were aged 2-5 years and female (60%). All participants (100%) reported symptoms of nasal blockage, snoring, and mouth breathing. A majority (61.4%) had grade 2 tonsillar hypertrophy. After 3 months of medical treatment, 57.9% experienced complete relief of nasal symptoms, including sleep apnea, 24.6% showed moderate improvement, and 17.5% saw no improvement. ***Conclusion:*** Intranasal steroids, combined with oral amoxicillin e-clavulanic acid and montelukast, reduce adenotonsillar hypertrophy symptoms and lower surgical intervention rates. This approach targets inflammation and infection, potentially improving patients' quality of life. More studies are needed to establish guidelines and optimize treatment.

Keywords: Adenotonsillar hypertrophy, Obstructive sleep apnea, OSA, Nasal blockage, Snoring.

INTRODUCTION

Obstructive sleep apnea (OSA) syndrome is a highly prevalent condition in children, characterized by snoring, witnessed apnea, unrefreshing sleep, and excessive daytime sleepiness [1, 2]. Children with OSA experience recurrent periods of elevated upper airway resistance during sleep due to partial or complete upper airway obstruction, resulting in snoring, episodic oxyhemoglobin desaturation, hypercapnia, and repeated arousals [3, 4]. The respiratory disturbance of recurring hypoxia-reoxygenation episodes during the night is associated with increased risks of suboptimal growth, poor sleep quality, neurocognitive dysfunction, behavioral problems, overweight status, and cardiovascular disease in childhood [5, 6]. The prevalence of OSA is approximately 2-3% in children, [7] and current studies have assessed the impact of OSA on various associated morbidities [8, 9] and sought to identify factors predicting poor treatment outcomes [10]. The choice of therapy for OSA depends on the etiology, severity, and individual history of increased upper airway resistance. Timely diagnosis and appropriate treatment of OSA are crucial, as untreated OSA can lead to significantly higher healthcare costs [11, 12]. Adenotonsillar hypertrophy is considered a key factor in the development of OSA in otherwise healthy children. Adenotonsillectomy (AT) is recommended as the first line of treatment for childhood OSA by the American Academy of Pediatrics, and the effectiveness of AT in treating children with OSA has been confirmed by several studies [13, 14]. However, some studies have shown an incomplete resolution of OSA after surgery [15]. The objective of this study was to assess the treatment outcomes of adenotonsillar hypertrophy in children.

METHODOLOGY

This was a prospective observational study that was conducted in the department of Head & Neck Surgery (ENT), Dhaka National Medical Institute Hospital, Dhaka, Bangladesh. from January 2023 to June 2023. A total of 57 children with primary symptoms of mouth breathing, snoring, and sleep disturbances were enrolled in this study through a purposive sampling technique. Proper consent was obtained from all participants before data collection.

The Inclusion Criteria:

- Children aged 2-13 years with primary nasal symptoms with or without ear symptoms.
- Children with adenotonsillar hypertrophy where surgery is contraindicated, such as those with bronchial asthma or cardiac problems.

The Exclusion Criteria:

- Adenotonsillar hypertrophy with moderate to severe conductive deafness.
- Gross septal deviation.
- Parents who do not rely on medical treatment or prefer surgery for their children.
- Children sensitive to penicillin.

All of our participants received medical treatment tailored by age. Children up to 5 years were given oral phenoxymethyl penicillin 5ml twice daily, Montelukast 4 mg at night, and Fluticasone nasal spray once daily for 3 months. Older children (6-13 years) received amoxicillin e-clavulanic acid (375mg) 3 times daily, Montelukast 5-10 mg at night, and Fluticasone nasal spray once daily. All data were processed, analyzed, and disseminated using MS Office tools.

RESULT

In this study, the age distribution of participants showed that the majority (61.4%) were in the 2-5 years' age group. Additionally, 24.6% of the participants were from the 6-9 year's age group, and 14.0% were from the 10-13 years' age group. Nearly two-thirds of the children (60%) were female, while the remaining 40% were male. According to the presenting symptoms of participants, it was found that all participants (100.0%) reported nasal blockage, snoring, and mouth breathing. Sleep apnea was reported by 29.8%, dribbling of saliva by 66.7%, and deafness by 24.6%. In this study, the majority of participants (61.4%) had grade 2 tonsillar hypertrophy. Additionally, 33.3% had grade 3, 3.5% had grade 4, and 1.8% had grade 1 tonsillar hypertrophy. In this study, 36.8% of participants had allergic rhinitis as a comorbidity. Additionally, 28.1% had ADHD, and 12.3% had a learning disorder. After 3 months of medical treatment, 57.9% of participants experienced complete relief of nasal symptoms, including sleep apnea. Additionally, 24.6% showed moderate improvement in their nasal symptoms, while 17.5% observed no improvement.

Table 1: Age distribution of participants (N=57)

Age (Years)	n	%
2-5 yrs.	35	61.4%
6-9 yrs.	14	24.6%
10-13 yrs.	8	14.0%

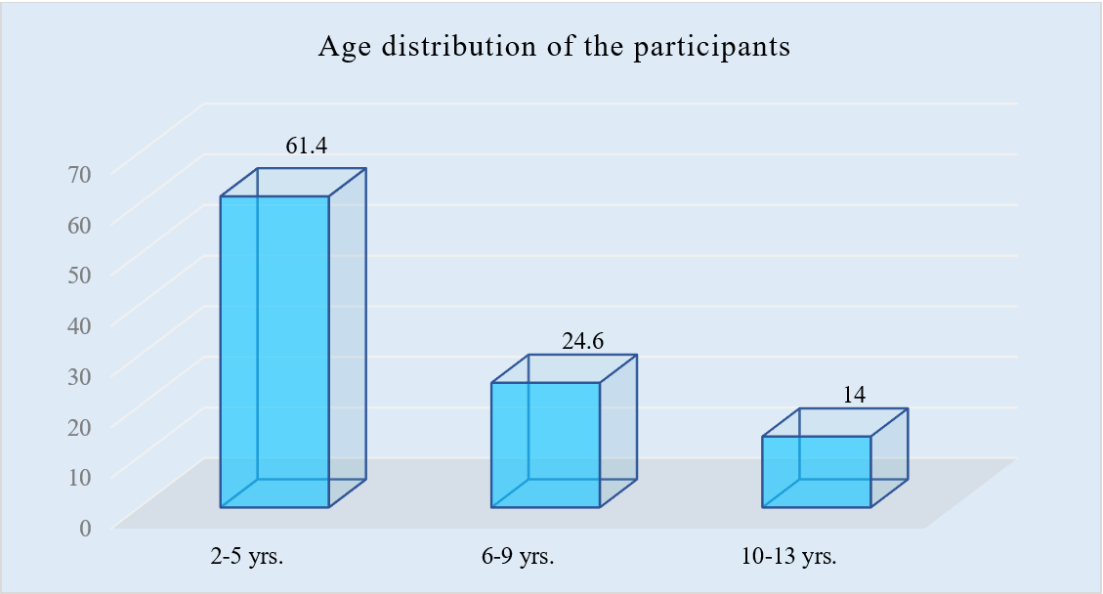

Figure I: Column chart showed age wise participants distribution (N=57)

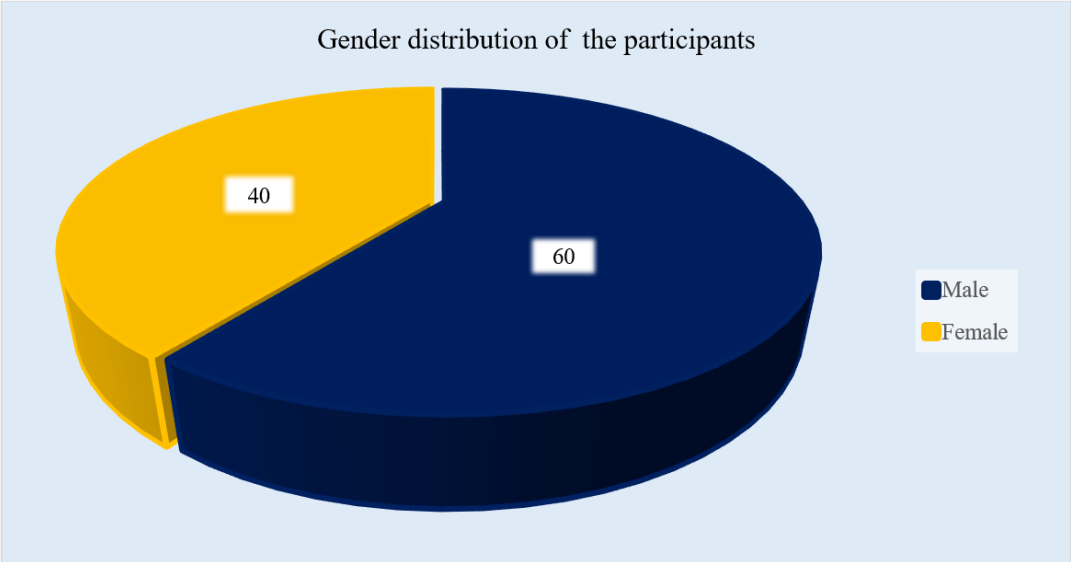

Figure II: Pie chart showed gender wise participants distribution (N=57)

Table 2: Distribution of presenting symptoms

Symptoms	n	%
Nasal blockage	57	100.0%
Snoring	57	100.0%
Mouth breathing	57	100.0%
Sleep apnea	17	29.8%
Dribbling of saliva	38	66.7%
Deafness	14	24.6%

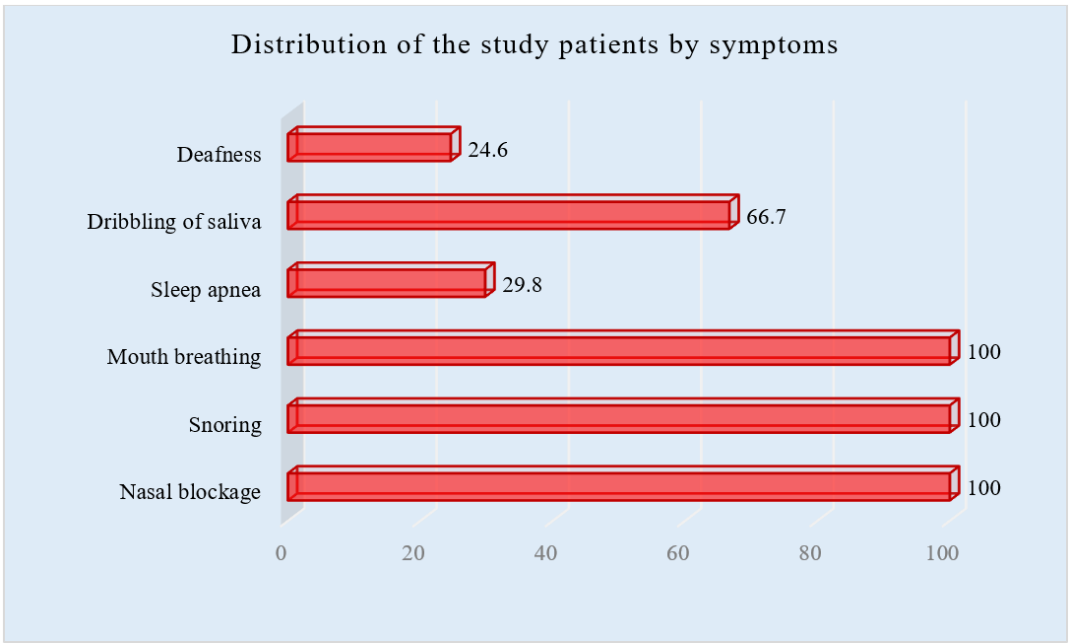

Figure III: Bar chart showed symptoms wise participants (N=57)

Table 3: Grade of tonsillar-hypertrophy

Tonsillar-hypertrophy	n	%
Grade 1	1	1.8%
Grade 2	35	61.4%

Grade 3	19	33.3%
Grade 4	2	3.5%

Table 4: Comorbidities distribution

Comorbidities	n	%
Allergic rhinitis	21	36.8%
ADHD	16	28.1%
Learning disorder	7	12.3%
PLM disorder	5	8.8%
Sinusitis	4	7.0%
Asthma	3	5.3%

Table 5: Outcomes after 3 months of medical treatment for nasal symptoms including sleep apnea

Outcomes	n	%
Complete relief	33	57.9%
Moderate improvement	14	24.6%
No improvement	10	17.5%

DISCUSSION

In this study, the majority of participants were from the 2-5 years' age group, similar to findings from another study [16]. Nearly two-thirds of the children in the current study were female. In the previous study [16], 56% of the 50 patients were female and 44% were male, resulting in a female-to-male ratio of 3:2. In our study, it was found that all participants (100%) exhibited symptoms of nasal blockage, snoring, and mouth breathing. Additionally, a significant number of participants experienced sleep apnea, dribbling of saliva, and deafness. In a related study conducted by Modrzyn´ski *et al.*, it was shown that three months of treatment with intranasal corticosteroids and antihistamines significantly reduced adenoidal hypertrophy and obstructive airway symptoms [17]. In this present study, the majority of participants (61.4%) had grade 2 tonsillar hypertrophy, which aligns with findings from another study [18]. Regarding the distribution of comorbidities, it was observed that more than one-third of the participants had allergic rhinitis. Additionally, there were cases of ADHD, learning disorders, PLM disorder, sinusitis, and asthma. Similar findings were observed in another study [19]. In this study, after 3 months of medical treatment, 57.9% of participants experienced complete relief of nasal symptoms, including sleep apnea. Additionally, 24.6% showed moderate improvement in their nasal symptoms, while 17.5% observed no improvement. Similar results were found in a study by Matin *et al.*, conducted in Bangladesh [16]. All findings from this current study could be valuable for future similar studies.

LIMITATION OF THE STUDY

This was a single-centered study with a small sample size conducted over a very short period. Consequently, the findings may not accurately reflect the nationwide scenario.

CONCLUSION & RECOMMENDATION

The use of intranasal steroids, along with oral penicillin and montelukast, is effective in reducing the size of adenotonsillar hypertrophy, alleviating symptoms, and decreasing the need for surgical intervention. This combined treatment approach offers a promising alternative to surgery by targeting inflammation and infection, thereby improving the quality of life for affected patients. Further studies are warranted to establish standardized guidelines and optimize treatment protocols.

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