

THE PHARMA INNOVATION

To investigate adenoidectomy impacts on patients with chronic adenoiditis in terms of middle ear function

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Background and Objectives: Otitis medium with effusion is an inflammatory disorder of the middle ear characterized by the presence of fluid in the middle ear without any symptoms indicating an acute ear infection. The objective of this study was to address two inquiries: firstly, to determine the extent to which adenoid hypertrophy was linked to hearing impairment in these children, and secondly, to examine the impact of adenoidectomy on middle ear function in children with chronic adenoiditis.

Methods: In this study, a total of 70 patients were included, with an equal distribution of 35 individuals for each gender. This cross-sectional study focused on patients with chronic adenoiditis who sought treatment at the ENT outpatient service at Department of Otorhinolaryngology, Sardar Rajas Medical College and Hospital, Bhawanipatna, Orissa, India during the period from August 2011 to July 2012. We employed the technique of sequential sampling.

Results: The study's findings indicate that an adenoidectomy effectively lowers fluid in the middle ear and significantly enhances hearing after surgery. Adenoidectomy is the recognized therapy for disorders such as obstructive sleep apnea syndrome and the cardio-respiratory implications of severe chronic adenoid hypertrophy. On the other hand, milder cases of chronic adenoiditis may not necessitate surgical intervention. Multiple randomized controlled studies have demonstrated the efficacy of nasal steroid spray in improving symptoms of allergic rhinitis and chronic adenoiditis.

Conclusion: Adenoidectomy reliably eliminates middle ear fluid and results in a substantial enhancement in hearing following the surgical intervention.

Keyword: Adenoidectomy, otitis media, and pure tone audiometry

INTRODUCTION

Otitis media is the second most common condition for which children and their families

seek medical advice from a pediatrician, after the common cold. Otitis media with effusion (OME) is presently the predominant factor contributing

to hearing impairment in children [1, 2]. Identification can be achieved by observing the accumulation of serous or mucous fluid in the middle ear, which is positioned behind an intact tympanic membrane, during an inflammatory process, while also noting the absence of signs and symptoms of acute infection. After the successful implementation of endoscopic sinus surgery in the 1990s, endoscopic adenoidectomy became the logical next step from traditional adenoidectomy because it allows for direct viewing throughout the procedure [2, 3]. The discoveries made by the adenoid have had a profound influence on history. The primary justification for Paul of Aegina's adenoid therapies in AD 640, aimed at reducing the outward protrusion in the nose and upper neck, was the use of trans-natal ligation. Schneider of Wittenberg conducted the earliest physical characterisation of the pharyngeal tonsil [4, 5]. Common symptoms of adenoid vegetation hypertrophy include snoring, mouth breathing, a unique facial expression, an increased likelihood of middle-ear disorders, hearing loss, and changes in voice. A wide range of tools has been designed specifically for the purpose of adenoid resection. Performing the procedure frequently resulted in substantial bleeding, however this can be efficiently stopped by either chemical cauterization or flushing with cold water [5, 6].

METHODOLOGY

In this study, a total of 70 patients were included, with an equal distribution of 35 individuals for each gender. This cross-sectional study focused on patients with chronic adenoiditis who sought treatment at the ENT outpatient service at Department of Otorhinolaryngology, Sardar Rajas Medical College and Hospital, Bhawanipatna, Orissa, India during the period from August 2011 to July 2012. We employed the technique of sequential sampling.

INCLUSION CRITERIA

- Visitors who seek medical attention from an Ear, Nose, and Throat specialist

- Adenoid hypertrophy patients with grades 3-4 must be of any gender and visit the outpatient department (OPD).

EXCLUSION CRITERIA

- Individuals with coagulation problems.
- Individuals who have craniofacial malformations, such as cleft palates.

RESULTS

Among the 70 patients, 18 fell between the age range of 5-7 years, while 52 patients were above the age of 9.

Table 1: Age distribution

Age group	Site			
	Choana	Multiple site	Peritubaric region	The superior part of the nasopharynx
5-7	5	10	3	0
> 9	14	12	22	4

Listed by age group, Table 1 shows the distribution of sites in the choana (19), multiple sites (22), peritubaric areas (25), and the superior section of the nasopharynx (4).

Table 2: Distribution of endoscopic grades according age

Age group	Endoscopic grading		Total
	Grade III	Grade IV	
< 7	15	20	35
> 7	20	15	35
Total	35	35	60

Table 2 displays the age distribution of endoscopic grades; 35 people make up grade IV and 35 people make up grade III.

Table 3: Radiological grading distribution by age group

Age group	Radiological grading			Total
	Mild	Moderate	Severe	
< 7	10	12	5	27
> 7	16	22	5	43
Total	26	34	10	70

Table 3 displays the radiological grade distribution by age group. In particular, 26 cases are classified as light, 34 as intermediate, and 10 as severe according to the distribution.

Table 4: Comparison of pre-operative and post-operative hearing improvement by age group

Hearing improvement difference	Age group	N	Mean	Standard deviation
Preoperative-1 month	< 7	10	10.00	6.00
Postoperative difference	> 7	50	10.20	4.12
Preoperative-3 months	< 7	6	12.10	4.30
Postoperative difference	> 7	54	11.12	5.30

Table 4 compares the preoperative and postoperative hearing improvements across age groups. The one-month preoperative-to-postoperative difference was made up of eight patients, whereas the postoperative difference involved fifty individuals.

Table 5: Evaluation of hearing improvement endoscopically prior to and following surgery

Hearing improvement difference	Endoscopic grading	Mean	Standard deviation
Preoperative-1 month	Grade III	12.26	5.00
postoperative difference	Grade IV	13.56	6.35
Preoperative-3 months	Grade III	12.29	6.59
Postoperative difference	Grade IV	13.98	6.46

Table 5 shows the mean and standard deviation for the comparison of the endoscopic grades III and IV for preoperative and postoperative hearing improvement.

Table 6: Pre-operative and post-operative radiological evaluation of hearing improvement

Hearing improvement difference	Radiological grading	N	Mean	Standard deviation
Preoperative-1 month	Mild	15	12.19	5.27
Preoperative-3 months	Mild	19	13.00	6.98
postoperative difference	Moderate	27	14.35	6.65
	Severe	09	14.53	6.29

Table 6 compares the standard deviations of preoperative and postoperative hearing improvement by radiological grading as 15, 9, and 27 for mild, severe, and moderate hearing impairment.

DISCUSSION

Adenoidectomy is the accepted treatment protocol for disorders including obstructive sleep apnea syndrome and the cardiorespiratory problems brought on by severe chronic adenoid hypertrophy. On the other hand, less severe cases of chronic adenoiditis may not require surgical intervention for treatment. Numerous randomized controlled trials have shown the effectiveness of nasal steroid spray in the treatment of allergic rhinitis and chronic adenoiditis. Ages five to seven accounted for five percent of the cases, according to Brooks’ research. Analyzed is the research conducted by Reddy, which produced comparable findings. Teenagers seven years of age and older are the age group most prone to adolescent onset symptoms [7, 8].

In our study, the percentage of men is slightly higher than the percentage of women. Tos and Stanger up found that because men are more prone to juvenile diseases, there was a larger prevalence of SOM in male children compared to female children. Still, Paradise and colleagues found no discernible gender difference in the prevalence of SOM. Due to their higher frequency of contact with allergic and contagious individuals, male adolescents are more vulnerable to childhood contamination than their female counterparts [9-11].

The symptoms listed by the patients included fullness, nasal discharge, hearing issues, and nasal obstruction or wheezing. Reddy's inability to be heard during his lectures used to draw harsh criticism. Wheezing, rhinorrhea, mouth breathing, and snoring were among the symptoms displayed by the patients in the Georgalas *et al.* study [12]. Middle ear effusion and Eustachian tube dysfunction in children are primarily caused by hypertrophic adenoiditis, which affects the nasopharyngeal lymphoid tissue, which is a

component of the Waldeyer ring. To ensure the appropriate operation of the auditory passages, an adenoidectomy should be carried out. Adenoidectomies were first carried out in 1885, and their use peaked in the 1960s. The authors disagree on the list of accepted indications for this kind of surgery. For persistent rhino adenoiditis linked to recurrent otitis media with effusion, it is still the recommended course of action. Numerous studies have demonstrated a significant improvement in Eustachian tube function following a denoidectomy. According to Koloudik *et al.*'s research, adenoidectomy is successful in 82-90% of cases [13-15].

TM was found to have an amber hue and a dull appearance by otoscopy in 78% of the cases. 58% of TM was initially estimated to be retractable. An 8% incidental focus on air bubbles was observed in the investigation. The most frequent otoscopic finding in Syed *et al.* was a slow-moving eardrum. Peritubaric area contamination was visible in a number of places, including the choana and the most desirable segment of the pharynx, in the majority of the specimens. 34% and 66% of patients, respectively, exhibited with adenoid hypertrophy of grade four and grade three. This research was comparable to that of Hibbert and Stell, who established a link between AH and OME levels [16, 17]. This finding reveals that the advancement of adenoid hypertrophy is a strong predictor of its development in affected individuals. Prior to surgery, one month later, and three months later, the average audiometry readings are 24.2, 13.28, and 12.2, respectively. A p-value is considered statistically significant when it falls below 0.0001. There is no statistically significant difference in hearing improvement from preoperative to one and three months after the procedure, as indicated by the following p-values: age (0.894 and 0.812), gender (0.901 and 0.913), location (0.939 and 0.971), adenoid (0.466 and 0.603), and radiological (0.974 and 0.777) gradings [17-19]. According to Fria *et al.*, the mean conductive listening loss is 27 dB, but OM reported an average of 24.5 dB. The investigation conducted by Dempster and

Mackenzie in Glasgow found a listening loss of 26 dB. Seven weeks and six months later, the proposed dB is 4.5 and 3.5 dB, respectively, as reported by Black *et al.* [20].

CONCLUSION

Adenoid hypertrophic children are at a higher risk of middle ear illness, which can cause permanent hearing loss. One of the suspected causes of chronic middle ear disease, which includes otitis media with effusion and consequent hearing loss, is hypertrophied adenoids obstructing the eustachian tube entrance. Adenoidectomy is a successful treatment for eustachian tube obstruction and for eliminating the underlying cause of adenoid hypertrophy in teenagers. The results of the study show that an adenoidectomy greatly improves postoperative hearing and efficiently resolves middle ear effusion.

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