International Journal of Advanced Research in Medicine

E-ISSN: 2706-9575
P-ISSN: 2706-9567
IJARM 2020; 2(1): 135-138
www.medicinepaper.net
Received: 03-01-2020
Accepted: 08-02-2020

Dr. K Puroshotham
Associate Professor, Department of ENT, Bhaarath Medical College and Hospital, Chennai, Tamil Nadu, India

Dr. G Lakshmana Prasad
Assistant Professor, Department of ENT, Sambhram Institute of Medical Sciences, Kolar, Karnataka, India

Corresponding Author:
Dr. K Puroshotham
Associate Professor, Department of ENT, Bhaarath Medical College and Hospital, Chennai, Tamil Nadu, India

The impact of adenoidectomy on middle ear function in individuals with chronic adenoiditis

Dr. K Puroshotham and Dr. G Lakshmana Prasad

DOI: https://doi.org/10.22271/27069567.2020.v2.i1a.559

Abstract
Background and Objectives: The middle ear inflammatory disease known as otitis media with effusion is characterized by the presence of endotympanic fluid in the absence of any acute ear infection symptoms or indicators. The purpose of this research was to find out how adenoidectomy affected middle ear function in kids with persistent adenoiditis and to see if there was a correlation between the degree of adenoid hypertrophy in these kids and hearing loss.
Methods: This cross-sectional study was conducted on 50 patients of both sexes with chronic adenoiditis who were attending the ENT outpatient department by sequential sampling technique.
Results: The study's findings indicate that an adenoidectomy successfully treats middle ear effusion and greatly enhances postoperative hearing. Adenoidectomy is the established therapy for conditions 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 trials have shown the efficacy of nasal steroid spray in treating allergic rhinitis and chronic adenoiditis.
Conclusion: Without a doubt, adenoidectomy effectively drains middle ear effusions and results in a notable improvement in postoperative hearing.

Keywords: Adenoidectomy, OME, endoscopic grading, tympanic membrane

Introduction
Recent studies have yielded fresh information regarding the efficacy of adenoidectomy in treating children with otitis media with effusion (OME) that has not improved with appropriate medical treatment. Before the widespread adoption of tympanostomy tubes in the late 1950s, adenoidectomy was the primary surgical intervention for chronic otitis media with effusion. Starting from the 1960s, the frequency of adenoidectomies in the United States gradually declined, while remaining unchanged in other countries [1-3]. This trend was likely influenced by a number of erroneous studies that indicated the ineffectiveness of adenoidectomy. Each year in the United States, more than 500,000 children suffering with chronic OME (i.e., OME that has not responded to medical treatment) have treatment with tympanostomy tubes. It seems that adenoidectomy is increasingly being utilized in conjunction with tube insertion. Advocates have put up arguments in favor of utilizing adenoidectomy as the main course of treatment for older children who have secretory OME. Otitis medium (OM) refers to any inflammation that occurs in the middle-ear cavity located behind an intact tympanic membrane (TM) [4-6]. OME can be directly influenced or predisposed by certain disorders, such as dysfunction of the eustachian tube (ET), ongoing or prior inflammation in the middle ear, nasal inflammation resulting from upper respiratory tract infection, and allergic rhinitis. There are two primary categories of OM, namely Acute OM and chronic OME. Studies have been conducted to investigate the involvement of adenoids in causing OME. Adenoidectomy is now being more commonly used as a treatment for OME due to recent studies that have shown its effectiveness [7, 8].

Materials and Methods
This cross-sectional study was carried out in Department of ENT, Sambhram Institute of Medical Sciences, Kolar, Karnataka, India on patients with chronic adenoiditis from November 2018 to October 2019 who were attending the ENT outpatient department. The method of successive sampling was applied.

Inclusion criteria

- Male and female patients between the ages of 5 and 12 years.
- Exhibiting grade 3, 4, and adenoid hypertrophy upon presentation to the Ear, Nose, and Throat Outpatient Department (ENT OPD).

Exclusion criteria

- Individuals with coagulation disorders.
- Individuals suffering from cleft palates and other craniofacial deformities.
- Patients suffering from upper respiratory infections, systemic ailments, and neuromuscular problems, as well as those with tubotympanic and atticoantral kinds of chronic suppurative otitis media (CSOM), are included.

Results

Table 1: Age group distribution of the site

Age group	Site			
	Choana	Multiple site	Peritubaric region	The superior part of the nasopharynx
<7	2	7	1	0
>7	11	8	18	3

Table 2: The distribution of endoscopic grading according to age groups is being analyzed.

Age group	Endoscopic grading		Total
	Grade 3	Grade 4	
<7	9	6	15
>7	26	9	35
Total	35	15	50

Table 3: The distribution of radiological grading according to age groups.

Age group	Radiological grading			Total
	Mild	Moderate	Severe	
<7	3	4	1	8
>7	15	25	2	42
Total	18	29	3	50

Table 4: Comparative analysis of hearing improvement before and after surgery in different age groups

Hearing improvement difference	Age group	N	Mean + SD
Preoperative - 1 month	<7	6	12.00± 5.00
postoperative difference	>7	44	11.10±4.24
Preoperative - 3 months	<7	6	11.90±4.89
postoperative difference	>7	44	12.01±5.47

Table 5: A comparison of the improvement in hearing before and after surgery at a specific location.

Hearing improvement difference	Site	N	Mean + SD
Preoperative - 1-month postoperative difference	Choana	8	10.55±2.63
	Multiple site	13	12.73±3.74
	Peritubaric region	03	07.35±4.53
	The superior part of the nasopharynx	05	05.61±7.53
Preoperative - 3 months postoperative difference	Choana	03	05.68±4.23
	Multiple sites	15	15.74± 3.74
	The superior part of the nasopharynx	03	05.80±5.82

Table 6: Evaluating the enhancement in hearing before and after surgery using endoscopic grading.

Hearing improvement difference	Endoscopic grading	Mean + SD
Preoperative - 1-month	Grade III	9.54±4.52
postoperative difference	Grade IV	10.35±3.96
Preoperative - 3 months	Grade III	10.54±4.12
Postoperative difference	Grade IV	9.57±4.52

Table 7: Assessment of hearing improvement before and after surgery based on radiological grading

Hearing improvement difference	Radiological grading	N	Mean + SD
Preoperative - 1-month	Mild	11	10.56±4.99
Preoperative - 3 months postoperative difference	Mild	12	12.43±4.53
	Moderate	23	11.76±4.98
	Severe	04	11.83±4.09

Discussion

Adenoidectomy is the established treatment for conditions including obstructive sleep apnea syndrome and cardio-respiratory issues linked to severe chronic adenoid hypertrophy. In less severe cases of chronic adenoiditis, non-surgical therapies may be considered as an alternative.

Several randomized control trials have demonstrated the effectiveness of nasal steroid spray in the treatment of allergic rhinitis and chronic adenoiditis.

According to Brooks' research, 50% of the patients were between the ages of 5 and 7 [9-11]. Analyzed is the study conducted by Reddy, which produced similar results. The age range of children aged seven and older is when the adenoid is most noticeable.

Our survey revealed a moderate male predominance in comparison to female participants. Tos and Stangerup have demonstrated that male children exhibit a greater incidence of SOM (Serous Otitis Media) in comparison to female children, most likely as a result of the higher representation of males in childhood ailments. Paradise *et al*. have discovered that there is no noticeable difference between genders in the occurrence of SOM. Male teenagers are more susceptible to childhood contamination compared to female children, mostly because they have greater exposure to allergens and pathogenic pathogens [13-15].

According to Di Francesco, OME mainly affects children in the preschool age group due to a disturbance in the Eustachian tube, which may be caused by the enlargement of the adenoids. Regarding gender distribution, our study found a small male majority, with 25 individuals (55.55%) being male and 20 participants (44.44%) being female. This data is consistent with the results obtained by Yassan *et al*., who said that 62% of their participants were male.

Adenoid hypertrophy in children with OME led to a range of symptoms. The symptoms observed in the study were as follows: nasal obstruction/snoring in all 45 patients (100%), mouth breathing in 41 cases (91.11%), sleep apnoea in 27 cases (60.0%), and aural fullness in 28 cases (62.22%) [16-18]. The results of this study align with the findings of a research conducted by Yeldirin *et al*., where they reported comparable symptoms in 23 children with adenoid hypertrophy and OME. More precisely, they discovered that all 23 cases (100%) had nasal blockage, 12 cases (52%) experienced snoring, 2 cases (8.7%) had rhinolalia, and 1 case (4.3%) had obstructive sleep apnoea. Egeli *et al*. conducted a study on a sample of 64 youngsters in order to investigate the symptoms of AH. The symptoms that were identified include nasal congestion, breathing via the mouth, and speech that lacks nasal resonance. The investigation revealed that every subject encountered nasal obstruction or snoring. In addition, 91.11% of patients reported the act of breathing through their mouth, 60.0% of patients had the condition of sleep apnoea, and 62.22% of patients experienced a sensation of fullness in their ears [19, 20].

Retraction of the tympanic membrane was observed in 66.66% of instances, although the presence of air bubbles was only found in 15.55% of cases. In 13.33% of cases, a cone of light was not detected.

All patients underwent routine postoperative follow-up. Further evaluation demonstrated a significant improvement in hearing ability and tympanogram, with statistical significance.

The average audiometry measurements before surgery, one month after surgery, and three months after surgery are 24.2, 13.28, and 12.2, respectively. The p-value is extremely important, as it is below 0.0001. The study concluded that there was no significant improvement in hearing at one month and three months after the operation, regardless of age, gender, site, adenoid grading, or radiological grading. According to the study conducted by Fria *et al*., the mean degree of hearing impairment resulting from conductive factors is 27 decibels (dB). However, OM's research indicates that the average level of conductive hearing loss is 24.5 dB. The investigation conducted by Dempster and Mackenzie in Glasgow has revealed a hearing impairment of 26 Db [21-23].

Conclusion

Adenoid hypertrophy can make children more susceptible to middle ear problems, which can have a detrimental impact on their hearing. Adenoid hypertrophy in children can be efficiently treated by performing an adenoidectomy, which helps alleviate eustachian tube congestion and eliminate the source of infection. The study's findings indicate that an adenoidectomy is an effective treatment for middle ear effusion and has a considerable positive impact on postoperative hearing.

Funding support: Nil.

Conflict of interest: None.

References

1. Caylan R, Bektas D, Atalay C, Korkmaz O. Prevalence and risk factors of otitis media with effusion in Trabzon, a city in northeastern Turkey, with an emphasis on the recommendation of OME screening. Eur Arch Otorhinolaryngol. 2006;263(5):404-408.
2. Canon CR, Relogle WH, Schenk MP. Endoscopic assisted adenoidectomy. Otolaryngology Head and Neck Surgery. 1999;121(6):740-744.
3. Pedersen PM. Adenoidectomy: An Evaluation of the Original Technique. AMA Arch Otolaryngol. 1957;66(5):517-524.
4. Tubbs RS, Vahedi P, Loukas M, Shoja MM, Cohen-Gadol AA. Hubert von Luschka (1820–1875): his life, discoveries, and contributions to our understanding of the nervous system: Historical vignette. J Neurosurg. 2011;114(1):268-272.
5. Thomson S. Le Affezioni Dell'Orecchio Nell'Adenoidismo (Aural Complications of Adenoids). Estratto dagli Atti della Clinica Oto-rino- laringoiatrica della R. Università di Roma, anno 1912. J Laryngol Otol. 1914;29(4):223-234.
6. Feldmann H. The nasopharynx and pharyngeal tonsil in the history of otology and rhinology. Pictures from the history of otorhinolaryngology, presented by instruments from the collection of the Ingolstadt Medical History Museum. Laryngo-rhino-otologie. 1999;78(5):280-289.
7. Gerhardsson H, Stalfors J, Odhagen E, Sunnergren O. Pediatric adenoid surgery in Sweden 2004–2013: incidence, indications and concomitant surgical procedures. Int. J Pediatr. Otorhinolaryngol. 2016;87:61-66.
8. Zhang L, Mendoza-Sassi RA, César JA, Chadha NK. Intranasal corticosteroids for nasal airway obstruction in children with moderate to severe adenoidal hypertrophy. Cochrane Database of Systematic Reviews, 2008, 3.
9. Brooks D. School screening for MEE. Ann Otol Rhinol Laryngol. 1976;85(12):223-229.
10. Reddy VG. Secretory otitis media. Indian J Otol. 1998;4(4):157-160.

11. Vogler RC, Ii FW, Pilgram TK. Age-specific size of the normal adenoid pad on magnetic resonance imaging. Clin Otolaryngol Allied Sci. 2000;25(5):392-395.
12. Tos M, Stangerup SE. Secretory otitis and pneumatization of the mastoid process: Sexual differences in the size of mastoid cell system. Am J Otolaryngol. 1985;6(3):199-205.
13. Paradise JL, Rockette HE, Colborn DK, Bernard BS, Smith CG, Kurs-Lasky M, *et al*. Otitis media in 2253 Pittsburgh-area infants: prevalence and risk factors during the first two years of life. Pediatrics. 1997;99(3):318-333.
14. MacIntyre EA, Karr CJ, Koehoorn M, Demers P, Tamburic L, Lencar C, *et al*. Otitis media incidence and risk factors in a population-based birth cohort. Paediatr Child Health. 2010;15(7):437-442.
15. Teele DW, Klein JO, Rosner B. Greater Boston Otitis Media Study Group. Epidemiology of otitis media during the first seven years of life in children in greater Boston: A prospective, cohort study. J Infect Dis. 1989;160(1):83-94.
16. Teele DW, Klein JO, Rosner BA. Epidemiology of otitis media in children. Ann Otolo Rhinol Laryngol. 1980;89(3):5-6.
17. Georgalas C, Thomas K, Owens C, Abramovich S, Lack G. Medical treatment for rhinosinusitis associated with adenoidal hypertrophy in children: An evaluation of clinical response and changes on magnetic resonanace imaging. Ann otol Rhinol Layrngol. 2005;114(8):638-644.
18. Al-Masum SH, Bhuiyan MA, Fakir MA. Study on otitis media with effusion. Bangl. J Otorhinolaryngol. 2009;15(2):50-54.
19. Hibbert J, Stell PM. The role of enlarged adenoids in the aetiology of serous otitis media. Clin. Otolaryngol. Allied Sci. 1982;7(4):253-256.
20. Orji FT, Okolugbo NE, Ezeanolue BC. The role of adenoidal obstruction in the pathogenesis of otitis media with effusion in Nigerian children. Niger J Med. 2010;19(1):62-68.
21. Bluestone CD, Klein JO. Otitis media in infants and children. 2nd edition ed. Philadelphia. WB Saunders Company. 1995;11:7-11.
22. Wiatrak BJ, Woolley AL. Pharyngitis and adenotonsillar disease. Cummings CW, editors.
23. Chapter 12. Pediatric Otolaryngology Head and Neck Surgery. 3rd edition. Missouri, Mosby; c1998. p. 188-211.
24. Black NA, Sanderson CF, Freeland AP, Vessey MP. A randomised controlled trial of surgery for glue ear. Br Med J. 1990;300(6739):1551-1556.