Original Article

Efficacy of Adenoidectomy in Improving Hearing in Patients with Persistent Secretory Otitis Media

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ABSTRACT

Objective: To determine the efficacy of adenoidectomy in modifying the hearing levels from severe to moderate and moderate to mild in patients of adenoid hypertrophy and persistent Otitis Media with Effusion presenting in Multan at Nishtar Hospital.

Study Design: Case control study

Place and Duration of Study: This study was conducted at the ENT department of Nishtar hospital, Multan from 9th August 2019 to 8th February 2020.

Materials and Methods: The total number of participants included in the study is 116 patients who possess symptoms of OME. The participant selected based on the convenience of the researcher and lie between the age group of 3 to 12 years including both genders. Patients who have septal defects, anatomic abnormalities, and tympanic membrane perforation are not included in the study and those who were selected have were informed through consent forms signed by their parent\s or guardian. By an experienced surgeon at the ENT department the selected children under general anesthesia were given an adenoidectomy procedure at Nishtar Hospital, Multan. After about 3 months period a follow up of the selected children was done of surgery for hearing levels and improvement in hearing. SPSS version 23 was used for data entry and analysis. P value ≥0.05 was considered as significant.

Results: The average age of OME children involved in this study was 6.98 ± 2.06 years with a gender-based division of 66 (56.90%) male patients and 50 (43.10%) female patients. Out of 116 children, 84 (72.41%) were between 3 to 8 years of age which forms the majority. The efficacy of adenoidectomy in improving the hearing levels from severe to moderate and from moderate to mild in 116 children suffering from persistent secretory otitis media and adenoid hypertrophy is found in 73 patients which form 62.93% of the total participant while 43 % have very less no effect through the surgical procedure of adenoidectomy.

Conclusion: In this study, the effectiveness of adenoidectomy in improving hearing loss in children with OME and hypertrophy of the adenoid gland is tested which was found highly efficacious. Consequently, the technique is highly suggested and prescribed to be done on regular basis in such patients to improve the hearing levels.

Key Words: OME (Otitis Media with Effusion), Hearing Loss, Adenoid Hypertrophy and Adenoidectomy

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INTRODUCTION

In emerging nations, an inflammatory condition known as OME (Otitis Media with Effusion) is becoming a major health concern. [1-3]

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OME is characterized by the buildup of serous fluid, either in the air cells or middle ear, with or without ear infection symptoms.[4] The condition is assumed to be generally benign and frequent in children, but it can have a number of short- and long-term impacts on children's auditory, linguistic, and cognitive development [5-7] A research conducted in Gujranwala found that 42% of children with infections of upper respiratory tract also had OME.

In a different study it was found that during the first 2 years 60% of the children suffer from episodes of OME and approximately 90% of the children suffer from at least one episode before going to the school. [6] OME with hearing loss can be seen in the children with enlarged adenoids. The hearing loss in such patients can be of varying severity.[10]

Usually, the disease is itself cured and is completely resolved in 4-6 weeks otherwise surgical treatment is recommended as none of the other methods were seen

to be effective against OME (Otitis Media with Effusion). In children with persistent OME the most effective treatments are myringotomy, grommet insertion, and adenoidectomy.[5] The common symptoms presented by children suffering from OME compromise of poor scholastic performance, inattentiveness, and occasionally recurring otalgia and slow learning. Clinical conclusions reached during otoscopy shows behind the eardrum there are air bubbles and/or air-fluid level, a contracted and bland tympanic membrane with limited mobility during siegalization, etc.[11-14] Conduction-related hearing loss and other in-ear procedures are diagnosed using audiometry and tympanometry. As primary related impairment is adenoidal hypertrophy , adenoidectomy is proven to be extremely beneficial in the majority of patients of OME. [9] In one study, patients' hearing levels improved by 58% after 3 months following adenoidectomy, whereas only 28% of patients had hearing loss with mild to moderate severity.[14] However, there are still few studies that support the efficacy of adenoidectomy for treatment of hearing loss in OME, and that this study was conducted to aid surgeons in considering adenoidectomy as a treatment option.

MATERIALS AND METHODS

Study was conducted at ENT department of Nishtar hospital, Multan from 9th August 2019 to 8th February 2020 in duration of one year. Study was approved by hospital committee of academic affairs after passing the defense. On the basis of researcher's convenience consecutive sampling method was used for sampling. The children selected presented symptoms for OME, hearing loss and adenoid hypertrophies were ranging from 3-12 years. There must be no abnormalities i.e. anatomical abnormalities, septal defects in the selected children and most certainly no previous palatal or ear surgery. An informed consent form was signed after informing the patient's parent/s or guardians. The study was concluded in 7 months. The researcher studied and collected all the cases of the children by herself. Audiometry and Tympanometry are used for assessing the demographic data of these children and the presence of OME symptoms in them. Through the lateral view of X-ray of nasopharynx the presence or absence of the adenoid hypertrophy can be assessed. Certain other causes of OME and factors affecting it were documented which include medication history, family history, feeding, other medical ailments, etc. In Nishtar Hospital Multan, for the surgical procedure of adenoidectomy, the patients were given anesthesia and the procedure was carried out by an experienced ENT surgeon in the ENT department. After the surgical procedure, a follow-up was done to re-examine the hearing profile and improvement after 3 months of the surgery with the tympanometry and PTA. For analyzing the collected data version 23 of SPSS software is used and the percentage and frequency of qualitative variables were calculated while for quantitative variables mean and the standard deviation was calculated. The qualitative data include gender, drug history, and history of bottle feed, history of meningitis, and level of preoperative hearing loss and postoperative level of hearing while the quantitative data include age, weight, and duration of OME. Stratification of data is done to control the effects of quantitative and qualitative variables. After stratification, $p < 0.05$ was measured after Chi-square test was performed and was found statistically significant.

RESULTS

Total 116 children suffering from OME were presented to ENT department and aged from 3 to 12 years of both genders with a mean age of 6.98 ± 2.06 years were studied. Out of these 72 % lie between 3 - 8 years while 27 % lie from 9 to 12 years. The ratio between male and female patients was 1.2:1, it was found after the gender-wise percentage distribution among 116 children which was 56.9 % male children while 43.1 % female children (Table-1). In this disease under study the mean duration is 5.79 ± 2.28 months and the mean weight was 27.53 ± 3.03 kg/m^2. The patient distribution based on drug history is 47.41 % have drug history while 52.59 % have no such history. Out of 116 patients, 35.34 % have a history of meningitis while 64.66 % have no such history. After adenoidectomy, the recovery from the disease of reduction in the symptoms of OME and adenoid hypertrophy was found in 62.93 % of patients while 37.07 % didn't show recovery or any reduction in symptoms which is mentioned in graph 1 mentioned below. The children in which adenoidectomy is found efficacious indicated the symptoms of improved hearing from severe to moderate and from moderate to mild. To study a better relationship stratification of various quantitative and qualitative variables was done.

Table No.1: Distribution of 116 Patients (100%) w.r.t

Age of Patients in Years		
3-8	84 Patients	72.41%
9-12	32 Patients	27.59%
Duration of OME in Months		
≤6	80 Patients	68.97%
>6	36 Patients	31.03%
Gender of Patients		
Male	66 Patients	56.90%
Female	50 Patients	43.10%
History of Drug Usage in Patients		
Yes	55 Patients	47.41%
No	61 Patients	52.59%
History of Meningitis		
Yes	41 Patients	35.34%
No	75 Patients	64.66%

Children who lie between 3 - 8 years of age showed 55 % stratified efficacy while those that range from 9 to 12 showed 18 % stratified efficacy with a p-value of 0.358. Male children showed 36 % stratified affectivity after the surgical procedure while female patients showed 37 % effective response with a p-value of 0.032. The stratified efficacy (yes/ no) concerning the duration of OSM is 50 % in the patient who had less than 6 months of duration and 30 % had no while those having more than 6 months of OSM duration showed 23 % efficacy and 13 % didn't show efficacy with a p-value of 0.886. The stratification of efficacy in patients with drug history is 35 % and 20 % have not while in those without such history 38 % and 23 % no history with a p-value of 0.881. The stratification of efficacy in patients with a history of meningitis was 25 % and 16 % had no history while in those without such history was 48 % and 27 % have not with a p-value of 0.747 which is statistically non-significant (Table-2).

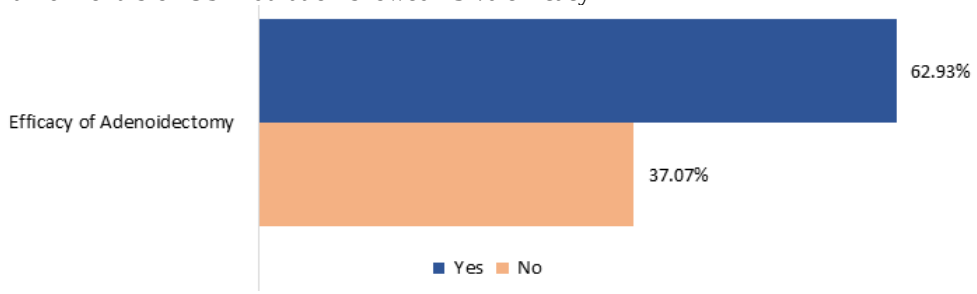

Figure No.1: Efficacy of adenoidectomy in improving hearing loss from severe to moderate and moderate to mild

Table No.2: Stratification of efficacy in 116 Patients (100%) w.r.t

Age of Patients in years	Efficacy		p-value
	Yes	No	
3-8	55 Patients	29 Patients	0.358
9-12	18 Patients	14 Patients	
Duration of OME in months	Efficacy		p-value
	Yes	No	
≤6	50 Patients	30 Patients	0.886
>6	23 Patients	13 Patients	
Gender of Patients	Efficacy		p-value
	Yes	No	
Male	36 Patients	30 Patients	0.032
Female	37 Patients	13 Patients	
History of Drug Usage in Patients	Efficacy		p-value
	Yes	No	
Yes	35 Patients	20 Patients	0.881
No	38 Patients	23 Patients	
History of meningitis	Efficacy		p-value
	Yes	No	
Yes	25 Patients	16 Patients	0.747
No	48 Patients	27 Patients	

DISCUSSION

OME (Otitis media with effusion) is an inflammation that affects the middle ear as a result of the production or buildup of too much endo-tympanic fluid. Sometimes the conditions show symptoms but most of the time no symptom of infection is seen therefore hearing loss, speech issue and cognitive impairment is found.[15-17] In the first two years of life, over 60% of children have suffered at least one episode of OME, and before they are old enough to start school, about 90% of children have at least one episode. In the United States, a total of 2.2 million pediatric populations per year faces complications related to otitis media with effusion. [16] Generally the disease is self-controlled and requires a duration of 4 to 6 weeks for complete resolution. When self-resolution through the body is not capable to decrease the complication then there is a need to get treated through the surgical procedure because most of the other medical treatments are found to be unsuccessful in reducing difficulties of Otitis media with effusion. In case of children with persistent Otitis media with effusion is adenoidectomy, myringotomy, and grommet insertion are the best treatment procedures. The study conducted in this report determines the effectiveness of adenoidectomy in treating hearing loss and other complications associated with otitis media with effusion.[19] The age group considered in the study ranges from 3 to 12 years with a ratio of male and female participants 1.2: 1. Out of 116 participants, 73 patients have positive effects from adenoidectomy and their hearing levels got improved after 3 months of adenoidectomy so, the total percent of success is 62.90 %. An earlier study on the effectiveness of adenoidectomy in OME (otitis media with effusion) showed 58 % improvement in hearing levels of mild to moderate hearing levels after 3 months of adenoidectomy. In a recent Cochrane review Van den Aardweg et al [21], significant benefits of adenoidectomy in resolving the complications of middle ear effusion in children suffering from OME, nevertheless the advantages of adenoidectomy towards hearing in such children are less and the outcomes over the variation in the tympanic membrane are unidentified. Consequently, the problems of the surgical

methods need to be well-adjusted with the probable advantages of adenoidectomy in constructing a decision towards or against this surgery. In different countries, different guidelines regarding the surgical procedures are there but in Italian Guidelines, for the patients suffering from OME the procedure of adenoidectomy is considered the first choice of treatment.[22-24] The findings of this study conclude that the procedure of adenoidectomy shows good improvement postoperatively in hearing and other complications associated with OME.

CONCLUSION

In this study effectiveness of adenoidectomy in improving hearing loss in children suffering from permanent OME and hypertrophy of the adenoid gland is tested which was found highly efficacious. Therefore, the procedure is highly recommended and prescribed to be done on regular basis in such patients to improve the hearing levels.

Author's Contribution:

Concept & Design of Study:	Sara Samad Qureshi
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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