

ORIGINAL ARTICLE

FREQUENCY OF OTITIS MEDIA WITH EFFUSION IN CLEFT PALATE CHILDREN

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ABSTRACT

Background: Children with cleft palate oftenly present with otitis media with effusion. The objective of this study was to determine the frequency of otitis media with effusion among cleft palate children.

Materials and Methods: This cross-sectional study was carried out in the Department of ENT, Pakistan Institute of Medical Sciences, Islamabad, Pakistan from June 2017 to December 2018. Ninety patients were selected through consecutive sampling technique. All children 3-10 years of age with cleft palate were included. Patients with combined cleft palate and cleft lip were excluded. All patients underwent otoscopy and tympanometry. Type B tympanogram was considered as evidence of fluid in the middle ear. Later on patients with only Type B tympanogram underwent myringotomies.

Results: Out of 90 (180 ears) patients 61 (67.78%) were males and 29 (32.22%) females. Mean age of the sample was 6.15 ± 2.226 years (3-10, range 7 years). On otoscopic examination, 107/180 (59.45%) ears were suspected to have fluid in the middle ear. Type B tympanogram was detected in 125/180 (69.45%) ears. Only 38/90 (42.20%) patients (76/180 ears), underwent pure tone audiometry. Based on otoscopic, tympanometric and audiometric findings, myringotomies were performed in 125/180 (69.45%) ears. At myringotomy fluid was present in middle ear space of 98/180 (78.4%) ears. Out of total 180 ears the true frequency of otitis media with effusion was 98/180 (54.45%).

Conclusions: The frequency of otitis media with effusion in patients with cleft palate is high. Tympanometry is fairly sensitive in diagnosing this condition in these patients.

KEY WORDS: Cleft Palate; Middle ear; Tympanic membrane; Hearing loss; Otitis Media with Effusion; Otoscopy; Tympanometry; Audiometry.

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INTRODUCTION

Young children with cleft palate universally present with otitis media with effusion (OME), and is debilitating if not recognized and managed early.¹ Otitis media with effusion is defined as presence of fluid in the middle ear without any symptoms and signs of acute infection.²

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The abnormal insertion of tensor palatini muscles and the shape of eustachian tube contribute to pathogenesis of OME in cleft palate children. A poor eustachian tube function leads to decreased middle ear pressure and tympanic membrane retraction.³ Children with clefts are at higher risk to develop OME than normal ones. The prevalence of OME accompanying cleft palate in Asian children has been reported as high as 71-76%,^{4,5} being much lower than among Europeans.⁶ Hearing loss, blocked ears and infrequent mild ear pain are common symptoms but the child may be asymptomatic.⁷

Important diagnostic otoscopic findings of OME include dull greyish tympanic membrane (TM), air fluid level, translucent membrane, prominent lateral process and decreased membrane mobility.⁸ Tympanometry is an effective screening tool and provides useful quantitative information about the presence of fluid in the middle ear, mobility of the middle ear

system, and ear canal volume. A type B tympanogram with flat curve and normal canal volume is considered diagnostic of OME.⁹

The objective of this study was to determine the frequency of otitis media with effusion among cleft palate children.

MATERIALS AND METHODS

Design, Settings & Duration: This cross-sectional study was carried out in the Department of ENT, Pakistan Institute of Medical Sciences, Islamabad, Pakistan from June 2017 to December 2018. Ethical approval for the study was obtained from the Institutional Ethical Committee.

Sample Selection: A written informed consent containing terms of inclusion in study, benefits and risks involved, was obtained from the parents of each patient. A sample size of 90 patients was selected through consecutive sampling technique. All children with cleft palate age 3-10 years were eligible. Patients with combined cleft palate and cleft lip were excluded from the study.

Conduct of Procedure: All patients were admitted. A detailed history with special emphasis on hearing loss was obtained. Otological evaluation was done with a standard otoscope with special emphasis on signs of OME i.e color, mobility and retraction of tympanic membrane, and presence of air bubbles or fluid level in the middle ear cavity. Tympanometry was carried out in all cases with a 226-Hz probe, while pure tone audiogram was performed in selected patients.

The following criterion was used for diagnostic myringotomy with the aid of operating microscope.

1. Otoscopic signs suggestive of OME.
2. Tympanometry, showing Type B tympanogram (flat curve and normal canal volume).
3. Pure tone Audiometry, showing conductive hearing loss with air-bone gap of > 15 dB.

All myringotomies were performed under general anesthesia. A radial incision was given in the antero-inferior quadrant of the tympanic membrane. The myringotomy findings were recorded as confirmatory for OME when fluid was aspirated from the middle ear.

Routine urine examination, complete blood count, and HbsAg and Anti-HCV were carried out for all patients who were planned for myringotomy.

Data Collection & Analysis Plan: A Performa was used for each patient having following variables noted. Demographic variables were sex (males/females), age in years and age groups (03-05, 06-08 & 09-10 years). Research variable was presence of OME (yes/no). Sex and presence of OME were nominal data, age groups were ordinal and age in years was a numeric data. Nominal and ordinal

data were described as frequency and percentage. Numeric data was described as mean, standard deviation, minimum, maximum and range. Keeping in view objective and design of the study no further analysis was applicable.

RESULTS

A total of 90 (180 ears) patients were included in this study, including 61 (67.80%) males and 29 (32.20%) females. Mean age of the sample was 6.15 ± 2.226 years (3-10, range 7 years).

The analysis for age groups is given in Table 1. The modal age group was 03-05 years.

Out of these 90 cases, 67 (74.45%) were repaired while 23 (25.55%) were unrepaired clefts.

Regarding clinical presentation at the time of admission, only 32/90 (35.55%) patients had history of hearing loss. On otoscopic examination, 107/180 (59.45%) ears were suspected to have otitis media with effusion based on abnormal findings. (Table 2)

Type B tympanogram with flat curve and normal canal volume was detected in 125/180 (69.45%) ears.

Only 38/90 (42.20%) patients (76/180 ears), underwent pure tone audiometry. Out of these, 67/180 (37.22%) ears showed an air-bone gap of > 15 dB. Based on otoscopic, tympanometric and audiometric findings, myringotomies were performed in 125/180 (69.45%) ears. At myringotomy fluid was present in middle ear space of 98/180 (78.4%) ears, while 27 (21.6%) ears were dry. Thus out of total 180 ears the true frequency of otitis media with effusion (OME) was 98/180 (54.45%). (Table 4)

Table 1: Age group wise distribution of the cleft palate patients (n=90)

Age groups	Frequency	Percentage
03-05 years	41	45.55%
06-08 years	31	34.45%
09-10 years	18	20.00%
Total	90	100.00%

DISCUSSION

Cleft palate greatly increases the risk for otitis media with effusion (OME) leading to mild to moderate conductive hearing loss.¹⁰ Indeed, screening studies have documented a near universal prevalence of OME in cleft palate children.¹¹ The age range of the patients in present study is similar to that in a local study by Saqulain et al.¹²

Contrary to our results, a retrospective study of 44 patients with OME in cleft palate children from Chennai,¹³ India reported an estimated rate of 47.27% in patients aged years 8 or older while in the study by Ungkanont, et al., majority (81.1%) of the patients

Table 2: Otoscopy findings of cleft palate patients suspected of OME (n=180 ears)

S. No.	Otoscopy findings	Frequency	Percentage
1	Greyish tympanic membrane	95	52.78
2	Absence of light reflex	82	45.55
3	Bulging tympanic membrane	14	07.78
4	Fluid level	08	04.45
5	Impaired mobility	59	32.78
6	Air bubbles	26	14.45

Table 4: Myringotomy findings in OME patients with cleft palate (n=125 Ears)

Myringotomy Results	Male (n)	%age	Female (n)	%age	Number of Ears	Percentage
Fluid Aspirated	72	57.60%	26	20.80%	98	78.40%
Dry Ear	17	13.60%	10	08.00%	27	21.60%
Total	89	71.20%	36	28.80%	125	100.00%

were from < 2-year age group.¹⁴

Our study is consistent with other studies in showing male preponderance.^{10,11} But D'Millo J, et al. reported female preponderance in their study.¹⁵

In our study 67% of the clefts were already repaired but in a study by Ungkanont, et al. majority (92.6%) of the patients were from repaired clefts group.¹⁴ In the present study 35.55% of the patients reported some degree of hearing loss, results being less than that documented by other studies.^{14,15}

In majority of the patients the main diagnostic otoscopic findings were Greyish tympanic membrane, absence of light reflex, bulging tympanic membrane, fluid level, impaired mobility, air bubbles in middle ear. These findings are in agreement with those reported by Lukman and his colleagues.¹⁶

Tympanometry is a universal objective screening test to measure the middle ear pressure and compliance of the tympanic membrane. Tympanometry was done in all the ears (180) and most of the ears 125 (69.45%) had type B curve. Nearly similar results of 75% and 72.65% were also found in studies from India and Thailand.^{17,18} Contrary to these reports, type B curve was seen in only 7% and 23.7% in other international studies.^{13,19}

Based on otoscopic, tympanometric and audiometric findings, myringotomies were performed in 125 ears (69.45%). At myringotomy fluid was present in middle ear space of 78.4% (98/125) while 21.6% (27/125) ears were dry. Out of total 180 ears the true frequency of otitis media with effusion in our series was 54.45% (98/180) which is almost matching the results reported by Lukman et al.¹⁶ In a local study by Saqulain et al. reported a higher incidence (72.5%) of OME in cleft palate children.¹²

But contrary to the above findings a study from Ni-

geria reported a very low frequency 28.55%.²⁰

CONCLUSION

The frequency of otitis media with effusion in patients with cleft palate is high. Tympanometry is fairly sensitive in diagnosing this condition in these patients. The hearing of children with cleft palate should be screened regularly to avoid impaired hearing sequelae like speech and language development.

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CONFLICT OF INTEREST

Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	AH, WUB, MIK
Acquisition, Analysis or Interpretation of Data:	AH, WUB, MIK, MAA, AK, MI
Manuscript Writing & Approval:	AH, WUB, MIK, MAA, AK, MI

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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