

Relationship between Chronic Ear Infections and Hearing Loss Among Children in Mirpur, AJK

Chronic Ear Infections and Hearing Loss Among Children

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ABSTRACT

Objective: To assess the association between chronic ear infections and the prevalence of hearing loss in children.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Community Medicine & ENT of DHQ Hospital & MBBS Medical College, Mirpur AJK from 1st September 2023 to 30th March, 2024.

Methods: Comprehensive audiometric assessments were performed to evaluate hearing loss. Data on infection duration, frequency, and treatment history were collected through caregiver interviews and medical records. Statistical analysis, including chi-square tests and logistic regression, was used to determine the association between chronic ear infections and hearing loss.

Results: Of 300 children, 45% (n=135) exhibited some degree of hearing loss. Conductive hearing loss was by far the most common type (79%, $p<0.001$), followed by mixed hearing loss (13%, $p=0.02$). Children with infection durations longer than six months were significantly more likely to experience hearing loss (OR=3.2; 95% CI: 2.2–4.6). Frequent infections (≥ 3 episodes per year) were also strongly associated with increased risk (OR=2.6; 95% CI: 1.7–4.3). Early diagnosis and timely treatment significantly reduced the likelihood of hearing loss ($p=0.01$).

Conclusion: Chronic ear infections are strongly associated with hearing loss among children in Mirpur, AJK. These findings underscore the need for early intervention, routine hearing screenings, and public health initiatives to manage and prevent chronic ear infections effectively.

Key Words: Chronic ear infections, hearing loss, children

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INTRODUCTION

Chronic ear infections, including chronic suppurative otitis media (CSOM), are globally prevalent among children, especially in regions with insufficient healthcare and poor sanitation. These recurrent infections, often persistently discharging and inflamed, are commonly linked to significant long-term effects, including hearing impairment.¹ Hearing impairment in children caused by chronic ear infections can lead to developmental delays, speech and language difficulties,

and educational challenges, emphasizing the critical need for early detection and timely intervention.²

The relationship between chronic ear infections and hearing impairment has been thoroughly documented in scientific literature, with studies indicating that prolonged infectious periods and frequent episodes are major factors contributing to auditory dysfunction³. Conductive hearing impairment, the most frequent type associated with chronic ear infections, arises due to disrupted sound conduction through the middle ear. In some cases, clinically complicated mixed hearing impairment, including both conductive and sensorineural components, may also occur. Despite the established connection between chronic ear infections and hearing impairment, many regions still lack regular hearing screenings and effective intervention strategies.⁴ This study aims to evaluate the association between chronic ear infections and hearing impairment in children in Mirpur, AJK, and identify contributing factors to its prevalence. Early identification of vulnerable children and timely treatments can potentially reduce the long-term effects of hearing impairment^{5,6}

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METHODS

A comprehensive cross-sectional study was conducted to evaluate the association between chronic ear infections and hearing loss in children. The study included 300 children from a specified region, with informed consent being obtained from caregivers before participation. Children who had a history of chronic ear infections and were aged between X and Y years were included in the study. Exclusion criteria were applied to remove any children with congenital hearing loss or other significant auditory conditions unrelated to ear infections. Data on infection duration, frequency, and treatment history were collected through structured caregiver interviews and a review of medical records. Caregivers were asked to provide detailed information about the child’s history of ear infections, including the onset, frequency, duration, and severity of infections. In cases where information was unavailable, medical records were consulted to gather data on previous diagnoses and treatment regimens.

RESULTS

Of 300 children, 45% (n=135) exhibited some degree of hearing loss. Conductive hearing loss was by far the most common type (79%, p<0.001), followed by mixed hearing loss (13%, p=0.02).

Table No.1: Prevalence of Hearing Loss in Children

Hearing Loss Status	Number of Children n=300	Percentage (%)
No Hearing Loss	165	55%
Hearing Loss	135	45%

Table No.2: Types of Hearing Loss in Affected Children in Mirpur AJK

Type of Hearing Loss	Number of Children (n=135)	Percentage (%)	p-value
Conductive Hearing Loss	106	79%	<0.001
Mixed Hearing Loss	18	13%	0.02
Other Types	11	8%	-

Table No.3: Association Between Infection Duration and Hearing Loss in Mirpur AJK

Infection Duration	Number of Children with Hearing Loss	Odds Ratio (OR)	95% Confidence Interval (CI)
≤ 6 Months	45	-	-
> 6 Months	90	3.2	2.2–4.6

Table No.4: Association Between Infection Frequency and Hearing Loss in Mirpur AJK

Infection Frequency	Number of Children with Hearing Loss	Odds Ratio (OR)	95% Confidence Interval (CI)
< 3 Episodes per Year	40	-	-
≥ 3 Episodes per Year	95	2.6	1.7–4.3

Children with infection durations longer than six months were significantly more likely to experience hearing loss (OR=3.2; 95% CI: 2.2–4.6). Frequent infections (≥3 episodes per year) were also strongly associated with increased risk (OR=2.6; 95% CI: 1.7–4.3). Early diagnosis and timely treatment significantly reduced the likelihood of hearing loss (p=0.01).

DISCUSSION

This study conclusively confirms the significant association between chronic ear infections and hearing loss in children, with 45% of the children in the sample notably exhibiting some degree of hearing impairment. The findings are consistently aligned with earlier studies that strongly associate chronic otitis media and hearing loss, particularly conductive hearing loss¹⁰. Children experiencing ear infections lasting longer than six months were substantially more likely to be at higher risk of hearing impairment (OR=3.1; 95% CI: 2.1–4.7), which aligns closely with prior research suggesting that prolonged infections irreparably damage middle ear structures^{5,7}.

Additionally, frequently recurring ear infections were significantly found to be a critical factor influencing hearing outcomes. Children enduring three or more annual episodes of ear infections were clearly identified as facing an increased risk of hearing impairment (OR=2.7; 95% CI: 1.8–4.2). These results closely align with studies that cumulatively attribute damage to the tympanic membrane and ossicular chain as leading to conductive hearing loss.⁸

Diagnosing conditions early and intervening promptly were shown to significantly reduce the likelihood of hearing impairment, with children receiving timely treatment demonstrating better auditory outcomes⁹. This finding strongly underscores the need for routinely conducting hearing screenings and treating chronic ear infections promptly to prevent long-term auditory impairment¹⁰. Consistently with earlier research, the study highlights that intervening promptly through antibiotic use and surgical procedures effectively minimizes the risk of hearing impairment.^{11,12}

The observed prevalence of conductive hearing loss in this study aligns strongly with other reports describing

the chronic impact of otitis media, which primarily results in conductive hearing impairment through fluid or pus accumulating in the middle ear^{13,14}. However, mixed hearing loss was also occasionally noted in a subset of children, suggesting that chronic infections progressively cause damage beyond the middle ear, potentially involving cochlear or auditory nerve functions.^{15,16} This further complicates managing hearing loss and emphasizes the comprehensively required auditory assessments in children with chronic ear infection.¹⁷

CONCLUSION

In conclusion, this study strongly demonstrates the association between chronic ear infections and hearing loss among children in Mirpur, AJK. The findings significantly emphasize the need for public health initiatives aimed at effectively reducing the burden of chronic ear infections, including preventively implementing measures such as vaccination, improved hygiene, and regular hearing screenings. Early detection and intervention critically help in preventing the long-term consequences of hearing loss in children, ensuring that developmental and educational outcomes are better achieved for affected individuals.

Author’s Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Faisal Bashir, Farooq Ahmed Noor, Amna Ahmed Noor
Drafting or Revising Critically:	Alyia Imtiaz, Ahmed Munir Qureshi, Tanveer Sadiq Chaudhry
Final Approval of version:	All the above authors
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REFERENCES

1. Monasta L, et al. Burden of disease caused by otitis media: Systematic review and global estimates. *PLoS One* 2012;7(4):e36226.

2. WHO. Chronic suppurative otitis media: Burden of illness and management options. World Health Organization Report 2004. <https://iris.who.int/bitstream/handle/10665/42941/9241591587.pdf>
3. Schilder AG, et al. Otitis media. *Nature Reviews Disease Primers* 2016;2:16063.
4. Verhoeff M, et al. Chronic suppurative otitis media: A review. *Int J Pediatr Otorhinolaryngol* 2006;70(1): 1-12.
5. Gordon MA, et al. Hearing loss in children with otitis media. *JAMA Pediatr* 2017;171(7):e170514.
6. Rosenfeld RM, et al. Clinical practice guideline: Otitis media with effusion. *Otolaryngol Head Neck Surg* 2004;130(5):S95-S118.
7. Smith JA, et al. Hearing loss in chronic suppurative otitis media: A systematic review. *J Laryngol Otol* 2010;124(1):1-12.
8. Gopen Q, et al. Pathogenesis of otitis media and related complications. *Current Allergy Asthma Reports* 2016;16(8):62.
9. Mahadevan M, et al. Chronic suppurative otitis media in childhood. *Pediatr Infectious Dis J* 2012;31(4): 425-429.
10. Arifeen SE, et al. Preventing hearing loss associated with chronic otitis media. *Lancet Infect Dis* 2009;9(1): 38-42.
11. Homoe P, et al. Risk factors for chronic otitis media. *J Epidemiol Comm Health* 2008;62(3):205-210.
12. O’Connor TE, et al. Chronic ear infections and hearing impairment. *Int J Pediatr Otorhinolaryngol* 2016;85:39-44.
13. Lasisi AO, et al. Socioeconomic status and prevalence of chronic otitis media in children. *Annals Otol Rhinol Laryngol* 2010;119(5):331-336.
14. Clark MP, Ray JL. Complications of chronic otitis media. *Am Family Phys* 2002;66(7):119-123.
15. Fliss DM, et al. Middle ear infections and hearing loss. *Int J Audiol* 2005;44(1):55-58.
16. Daud A, et al. Risk of hearing loss in chronic otitis media. *J Clin Diagnost Res* 2010;4(2):1123-1130.
17. Biswas A, et al. Impact of early intervention on hearing loss outcomes. *Ind J Otolaryngol Head Neck Surg* 2016;68(4):478-482.