DOI: https://doi.org/10.53350/pjmhs221631212

ORIGINAL ARTICLE

Risk Factors of Acute Otitis Media in Early Age (A Meta-Analysis)

ISHFAQ AHMED[1], AKHTAR ALI LAKHIAR[2], SAJJAD YOUSUF[3], AMRAT KUMAR[4], MUHAMMAD ASIF ASHRAF[5], ABID RAFIQUE CHAUDHRY[6]

[1]Assistant professor Deptt of ENT Bilawal medical Hospital Kotri, LUMHS Jamshoro.
[2]Senior registrar. E.n.t dept lumhs jamshoro
[3]Consultant Deptt of ENT Civil Hospital Hyderabad
[4]Assistant professor Deptt of ENT Isra university Hyderabad
[5]Senior Registrar Deptt of ENT Bakhtawar Amin Trust teaching Hospital Multan, Pakistan
[6]Consultant Pediatric Critical Care medicine Fatima memorial College of medicine and Dentistry Lahore
Corresponding author: Ishfaq Ahmed, Email: ishfaqarain37@yahoo.com, Cell: 03337594123

ABSTRACT

Objective: The purpose of this study is to evaluate the risk factors of acute otitis media in children.
Study Design: Case Control study
Place and Duration: Conducted at Bilawal medical Hospital Kotri, LUMHS Jamshoro, during from the period August 2021 to January 2022.
Methods: There were 110 children with ages 1 month to 6 years were presented in this study. After obtaining informed written permission, a mother's age, parity, gestational age, and smoking history were documented in detail for each of the instances described. Patient's clinical presentation were also recorded. All the patients had confirmed acute otitis media. Risk factors of AOM among enrolled cases were recorded. SPSS 21.0 was used to analyze complete data.
Results: Among 110 children, there were 65 (60.2%) males and 43 (39.8%) females. We found that majority of the cases 42 (38.2%) were aged between 1month to 2-years had AOM.Symptoms included fever, otalgia, otorrhea, restlessness, nausea, vomiting, hearing loss, and tinnitus or vertigo in individuals. Tobacco usage by the parents, premature birth, supine bottle feeding, pacifier use, and day care attendance were all significant risk factors for acute otitis media (AOM). The current investigation showed no link between AOM and a craniofacial abnormality.
Conclusion: We found that bottle feeding,day care attendance during the first 10 months of life, supine bottle feeding, pacifier usage in the second 6 months of life, parental cigarette smoking, preterm infant, and allergy were significant risk factors for AOM.
Keywords: Children, AOM, Pacifier, Smoking Clinical Features

INTRODUCTION

AOM, or acute otitis media, is one of the most prevalent infectious infections in children. Recurring bouts of AOM may lead to hearing loss and delayed speech development, which might affect a child's academic achievement in the future [1]. The number of office visits for AOM in the United States grew from 9.91 million in 1975 to 24.5 million in 1990 throughout this 15-year period [2–3]. Despite the lack of comparable data from other nations, it is reasonable to presume that a similar tendency has emerged in other industrialised countries. It's important to figure out whether the rise in AOM recurrences is connected to societal changes. It is impossible to do this study since AOM's environmental dangers have not been fully defined.Between the ages of 3 months and 3 years, AOM is most frequent.

Most children experience at least one AOM infection by the age of 7 and 75% have had many infections. AOM may occur at any age, although it is most common in children under the age of six, accounting for 80 to 90 percent of all cases in the US. It's not clear why guys are more impacted than females. Despite the frequent use of systemic antibiotics to treat the illness and its consequences, the disease's morbidity is nevertheless significant. Two forms of OM problems include intratemporal and intracranial. [5-7] Numerous factors increase your risk of AOM, including: Study findings have shown that early-onset Otitis Media (OM) is a major risk factor for the recurrence of otitis media (ROM).[8,9] Childhood OM has long-lasting impacts on hearing, speech development, behaviour and school performance [10.11] according to studies. In this way, it is possible to lessen the frequency of ROM and its subsequent health and developmental effects by successfully delaying the commencement of the first OM episode.

Prenatal risk factors have only been examined in a few research. Pregnant women who smoke, drink, or take medication during pregnancy, as well as pregnant women who are exposed to dioxin-like compounds or organochlorines, have been linked with a higher risk of having a child with autism [12,13]. It is not clear which prenatal and environmental variables lead to a greater risk of early OM in several available research. Previous research may have been hampered by a lack of relevant factors and an inadequate sample size [14,15].

Researchers in this research want to find out what increases a child's chance of developing acute otitis media.

MATERIAL AND METHODS

This case control study was conducted at Bilawal medical Hospital Kotri, LUMHS Jamshoro, during from the period August 2021 to January 2022 and comprised of 110 children. This research did not include infants who had lip-palate deformity owing to cranial deformation. It also did not include children who were born infected.

As part of the research process, a questionnaire form was created to gather all of the required data. Daycare attendance was a risk factor for acute otitis media (AOM), as was supine breastfeeding, pacifier usage in the second half of life, and passive cigarette smoke in the first six months of life. Other risk variables were craniofacial abnormality and allergy. In addition, the questionnaire included a thorough history of the condition, including the current complaint, its duration, and any symptoms that have appeared. Most of the information came from interviews with the child's parents or guardians and questionnaires they filled out on the spot.

All of the cases have been evaluated by an ENT physician who is accountable for them. The tympanic membrane's colour, translucency, light reflex, and location have all been examined using otoscopy. Complete data was analyzed using SPSS 21.0.

RESULTS

Among 110 children, there were 65 (60.2%) males and 43 (39.8%) females.(fig 1)

We found that majority of the cases 42 (38.2%) were aged between 1 month to 2-years had AOM. Symptoms included fever, otalgia, otorrhea, restlessness, nausea, vomiting, hearing loss, and tinnitus or vertigo in individuals.(table 1)

In this study mean age of the mother's was 33.2±4.14 years at child birth. Mean gestational age was 35.8±6.63 weeks and mean parity was 3.7±1.55. There were majority 85 (77.3%) were

house wives and 25 (22.7%) were job holders. Majority of the mothers 65 (59.1%) were not educated.(table 2)

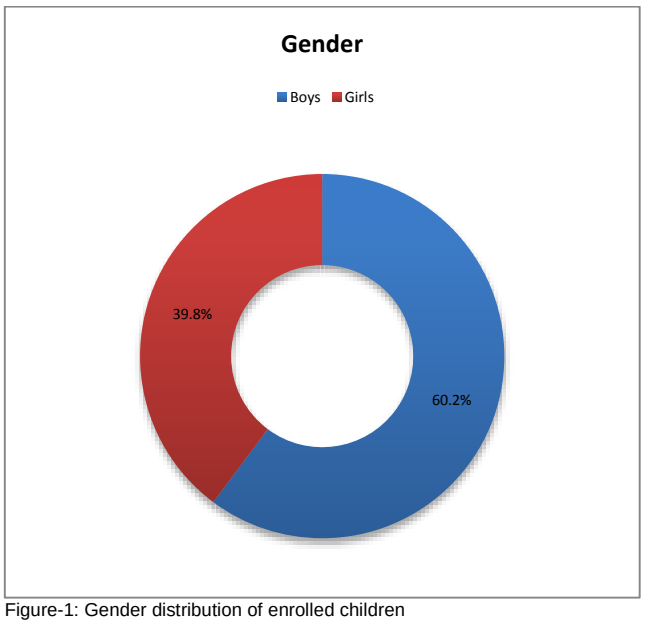

Figure-1: Gender distribution of enrolled children

Table-1: Age and symptoms of enrolled cases

Variables	Frequency	Percentage
Age Group		
1month-2years	42	38.2
3-4 years	35	31.8
5-6 years	33	30
Symptoms		
fever	26	23.6
otalgia	22	20
otorrhea	19	17.3
restlessness	17	15.5
nausea	13	11.8
vomiting	7	6.4
hearing loss	2	1.8
tinnitus	2	1.8
vertigo	2	1.8

Table-2: Characteristics of mother's among enrolled cases

Variables	Frequency	Percentage
Mean age (years)	33.2±4.14	
Mean Gestational ag (weeks)	35.8±6.63	
Mean parity	3.7±1.55	
Job status		
Yes	25	22.7
No	85	77.3
Education status		
Yes	45	40.9
No	65	59.1

Tobacco usage by the parents, smoking, premature birth, supine bottle feeding, pacifier use, allergy and day care attendance were all significant risk factors for acute otitis media (AOM).(table 3)

Table-3: Association of risk factors for AOM among cases

Variables	Frequency	Percentage
Risk Factors		
tobacco usage	45	40.9
smoking	60	54.5
premature birth	30	27.3
supine bottle feeding	26	23.6
pacifier use	18	16.4
day care attendance	15	13.6
allergy	33	30

DISCUSSION

Increased interaction with other children raises the likelihood of recurrent ADM; these encounters grow when children transition from home care to family day care and day care facilities (the child care associated with the most contacts). A continuous increase in risk in insufficient increments can lead to insignificant differences, which may be the reason for the insignificant risk ratios found when comparing family day care to home-care and day-care centres to home-care of children with less than three or three or more episodes of ADM. Over the last several years, the number of children being cared for outside of their homes, particularly at day care facilities, has grown significantly. ADM's increased frequency might therefore be explained only by changes to the way these facilities are organized.[16]

In this study 110 children were presented. Among 110 children, there were 65 (60.2%) males and 43 (39.8%) females. We found that majority of the cases 42 (38.2%) were aged between 1month to 2-years had AOM. These findings were comparable to the previous researches.[17,18] Symptoms included fever, otalgia, otorrhea, restlessness, nausea, vomiting, hearing loss, and tinnitus or vertigo in individuals.[19] In this study mean age of the mother's was 33.2±4.14 years at child birth. Mean gestational age was 35.8±6.63 weeks and mean parity was 3.7±1.55. There were majority 85 (77.3%) were house wives and 25 (22.7%) were job holders. Majority of the mothers 65 (59.1%) were not educated.[20]

Tobacco usage by the parents, smoking, premature birth, supine bottle feeding, pacifier use, allergy and day care attendance were all significant risk factors for acute otitis media (AOM).[25]Middle ear illness is more common in those who have been exposed to secondhand smoking [21]. Parental smoking was shown to enhance a child's chance of developing an acute middle ear infection in a meta-analysis on risk factors for acute otitis media [22]. Second-hand smoking was shown to be a significant contributor to the morbidity associated with COM/ROM in our research. Nicotine and smoking products have been linked to an increased risk of ear infections and the invasion of microorganisms into the middle ear, according to many studies. There is a risk of nasopharyngeal airway obstruction due to impaired mucociliary function of the ET in smokers [23]. Second-hand smoking-induced middle ear illness has been linked to bacterial adhesion to epithelial cell surfaces and a decrease in local immune function [24]. Reduced exposure to smoking is a public health emergency that has to be addressed right now.

Uhari et al. discovered that the use of a pacifier raises the incidence of AOM by a factor of two. – (24 percent). [25] This research in the United States found that from the 6th to 9th months of age, the use of an AOM-related pacifier was statistically significant in the period 9-12 months of age. [26] Using a pacifier has been linked to eustachian tube problems. "Positional OM" states that children who are bottle fed in an unsuitable position (e.g., lying down) are at greater risk for AOM, as demonstrated in a cohort of (698) children who were followed up from birth to two years of age and found that the supine bottle feeding position was associated with an earlier onset of AOM. [27,28]

There was no correlation between craniofacial abnormality and AOM in this investigation, which may be due to the limited sample size and the low number of instances of craniofacial abnormalities in the studied population.

CONCLUSION

We found that bottle feeding,day care attendance during the first 10 months of life, supine bottle feeding, pacifier usage in the second 6 months of life, parental cigarette smoking, preterm infant, and allergy were significant risk factors for AOM.

REFERENCES

1. Teele DW, Klein JO, Chase C, Menyuk P, Rosner BA, the Greater Boston Otitis Media Study Group. Otitis media in infancy and

intellectual ability, school achievement, speech, and language at age 7 years. J Infect Dis 1990; 162:685-94.
2. Schappert SM. Office visits for otitis media: United States, 1975-90. Vital Health Stat 1992;214:1-18.
3. Bluestone CD, Klein JO. Otitis media in infants and children. 2nd ed. Philadelphia: WB Saunders, 1995.
4. John M Graham, Glenis K Scadding. Pediatric ENT 2 nd ed. ISBN:978-3-540-3308-7. Springer Berlin Heidelberg New York;2007 :31-76
5. Robert E Rakel. Essential family medicine: fundamentals & case study. 3rd ed. Philadelphia, Pennsylvania: Elsevier; 2007.p.234-67
6. Marianne M Green, Jennifer A Bierman, JAMES j. Foody, Russell G. Robertson, Gary J. Martin. Prymary care mentor. Philadelphia, PA 19103, United States of America; 2009.
7. American Academy of Pediatrics Subcommittee on Management of Acute Otitis Media. Diagnosis and management of acute otitis media. Pediatrics 2004; 113(5):1451-65.
8. Pettigrew MM, Gent JF, Triche EW, Belanger KD, Bracken MB, Leaderer BP. Association of early-onset otitis media in infants and exposure to household mould. Paediatr Perinat Epidemiol. 2004;18: 441–447. pmid:15535820
9. Lasisi AO, Olayemi O, Irabor AE. Early onset otitis media: risk factors and effects on the outcome of chronic suppurative otitis media. Eur Arch Otorhinolaryngol. 2008;265: 765–768. pmid:18046567
10. Winskel H. The effects of an early history of otitis media on children's language and literacy skill development. Br J Educ Psychol. 2006;76: 727–744. pmid:17094883
11. Aarhus L, Tambs K, Kvestad E, Engdahl B. Childhood Otitis Media: A Cohort Study With 30-Year Follow-Up of Hearing (The HUNT Study). Ear Hear. 2014;
12. Miyashita C, Sasaki S, Saijo Y, Washino N, Okada E, Kobayashi S, et al. Effects of prenatal exposure to dioxin-like compounds on allergies and infections during infancy. Environ Res. 2011;111: 551–558. pmid:21324443
13. Jensen RG, Koch A, Homøe P, Bjerregaard P. Tobacco smoke increases the risk of otitis media among Greenlandic Inuit children while exposure to organochlorines remain insignificant. Environ Int. 2013;54: 112–118. pmid:23434818
14. Daly KA, Hoffman HJ, Kvaerner KJ, Kvestad E, Casselbrant ML, Homoe P, et al. Epidemiology, natural history, and risk factors: Panel report from the Ninth International Research Conference on Otitis Media. Int J Pediatr Otorhinolaryngol. 2010;74: 231–240. pmid:19836843
15. Braveman PA, Cubbin C, Egerter S, Chideya S, Marchi KS, Metzler M, et al. Socioeconomic status in health research: one size does not fit all. Jama. 2005;294: 2879–2888. pmid:16352796
16. Rosenblut A, Rosenblut M, García K, et al. Frequency of Acute Otitis Media in Children Under 24 Months of Age Before and After the Introduction of the 10-valent Pneumococcal Conjugate Vaccine Into the National Immunization Program in Chile. Pediatr Infect Dis J 2018; 37:132.
17. Kørvel-Hanquist A, Koch A, Niclasen J, Dammeye J, Lous J, Olsen SF, et al. (2016) Risk Factors of Early Otitis Media in the Danish National Birth Cohort. PLoS ONE 11(11): e0166465.
18. Gisselsson-Solen M. Trends in Otitis Media Incidence After Conjugate Pneumococcal Vaccination: A National Observational Study. Pediatr Infect Dis J 2017; 36:1027.
19. Bentdal YE, Håberg SE, Karevold G, Stigum H, Kværner KJ, Nafstad P. Birth characteristics and acute otitis media in early life. Int J Pediatr Otorhinolaryngol. 2010;74: 168–172. pmid:19959246
20. Zhang Y, Xu M, Zhang J, Zeng L, Wang Y, Zheng QY. Risk factors for chronic and recurrent otitis media-a meta-analysis. PLoS One. 2014;9(1):e86397. Published 2014 Jan 23.
21. Kum-Nji P, Meloy L, Herrod HG (2006) Environmental tobacco smoke exposure: prevalence and mechanisms of causation of infections in children. Pediatrics 117: 1745–175
22. Uhari M, Mantysaari K, Niemela M (1996) A meta-analytic review of the risk factors for acute otitis media. Clin Infect Dis 22: 1079–1083
23. Fukuma M, Seto Y, Fukushima K, Sakurai T, Dan K, et al. (1986) The effect of food dye and other environmental substances on the host defense reaction in mice in relation to virus infection. J Toxicol Sci 11: 169–177
24. Holt PG (1987) Immune and inflammatory function in cigarette smokers. Thorax 42: 241–249.
25. Kørvel-Hanquist A, Koch A, Niclasen J, Dammeye J, Lous J, Olsen SF, et al. (2016) Risk Factors of Early Otitis Media in the Danish National Birth Cohort. PLoS ONE 11(11): e0166465
26. Uhari M, Mantysaari K, Niemela M. A meta-analytic review of the risk factors for acute otitis media. Clin Infect Dis. 1996; 22: 1079–1083
27. Warren JJ, Levy SM, Kirchner HL, Nowak AJ, Bergus GR. Pacifier use and the occurrence of otitis media in the first yearof life. Pediatr Dent 2001;23:103-7
28. José Faibes Lubianca Neto, Lucas Hemb, Daniela Brunelli e Silva. Systematic literature review of modifiable risk factors for recurrent acute otitis media in childhood J Pediatr (Rio J) 2006; 82(2):87-96