

Prevalence of Acute Otitis Media in Febrile Children at a Tertiary Care Hospital

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ABSTRACT

Objective: To find out the prevalence of acute otitis media among febrile children presenting at a tertiary healthcare facility.

Study Design: A cross-sectional study.

Place and Duration of the Study: The Department of Pediatrics, Chandka Medical College, Shaheed Mohtarma Benazir Bhutto Medical University, Larkana from 1st January 2021 to 30th June 2021.

Material and Methods: A total of 118 children of both genders aged 2 to 11 years with fever (temp>100.4 °F) for a minimum duration of 6 hours were included. Demographic data along with presenting symptoms were noted. Auroscopy/otoscopy was performed in all cases for the diagnosis of AOM. All the study data was entered into SPSS version 26.0 for statistical analysis.

Results: In a total of 118 children, 67 (56.8%) were male. Mean age was noted to be 4.9±4.2 years (ranging between 2 to 12 years) and 62 (52.5%) children were aged between 2 to 5 years. Mean duration of fever was 6.20±1.7 days (ranging between 3 to 9 days) while 75 (63.6%) children had duration of fever above 5 days. Mean maximum reported fever was 103.04±1.1 °F. Irritability, dizziness, restlessness and diminished appetite were the most frequent symptoms noted in 98 (83.1%), 67 (56.8%), 61 (51.7%), and 58 (49.2%) patients respectively. The prevalence of AOM was observed in 27 (22.9%) febrile children.

Conclusion: The prevalence of acute otitis media among febrile children was high. High index of suspicion for acute otitis media should be made whenever febrile children are presenting to pediatric healthcare facilities.

Keywords: Acute otitis media, febrile, irritability, dizziness.

INTRODUCTION

Acute otitis media (AOM) is considered to be a frequent problem affecting children of all age groups. Around 80% of the children are estimated to have at least 1 episode of AOM while between 80-90% of the children are calculated to have at least 1 episode of otitis media with effusion (OME) prior to school age.^{1,2}

The AOM is generally considered to be a complication of Eustachian tube dysfunction occurring due to viral upper respiratory tract infection (RTI). Streptococcus pneumonia, hemophilus influenza and Moraxella catarrhalis are some of the commonest causative agents of AOM among children.^{3,4} The most common presentation of AOM is presence of middle ear effusion along with pain, irritability, fever, sleeplessness at night and/or pain in the ear.^{5,6} Researchers have shown otorrhea and otalgia to be evident in 20% and 13% children respectively with AOM.⁷ In pediatric healthcare settings, diagnosis of AOM could be challenging while delayed or missed diagnosis might result in occurrence of complications. Antibiotics are usually prescribed to children accompanying fever. A study estimated prevalence of AOM among febrile children to be 18.3%.⁸

In pediatric emergency and outpatient settings, many of the children present febrile while exact extent about the burden of AOM among febrile children is not well studied in Pakistan. Estimating proportion of febrile children presenting with AOM might help us arranging required tools and resources for the timely management of this illness. So, the present study was aimed at finding out the prevalence of AOM among febrile children presenting at a tertiary healthcare facility.

MATERIAL AND METHODS

This cross-sectional study was conducted at Department of Pediatrics, Chandka Medical College, Shaheed Mohtarma Benazir Bhutto Medical University, Larkana from 1st January 2021 to 30th June 2021. Approval from Institutional Review Board was acquired. Informed and written consents were sought from parents/caregivers of all study participants and they were ensured about the privacy of their data. A sample size of 118 children was

calculated considering prevalence of AOM in febrile children as 18.3%⁸ with confidence level of 95% and margin of error as 7%.

Inclusion criteria was children of both genders aged 2 to 11 years with fever (temp>100.4 °F) for a minimum duration of 6 hours. Exclusion criteria was all children with congenital malformations (e.g. cleft lip or cleft palate) or those with neurological defects like cerebral palsy or all those were severely malnourished. Children with otitis media with duration of 14 or more days were also excluded.

A total of 118 children as per inclusion and exclusion criteria visiting department of pediatrics were studied. Demographic data along with history of ear pain, dizziness, irritability, restless sleep, diminished appetite were noted. Auroscopy/otoscopy was performed in all cases for the diagnosis of AOM. Diagnosis of AOM was made with the help of auroscopy/otoscopy showing appearance of ear drum with anyone of the following: infection of the vessels along the handle of the malleus and around the periphery, reddening with bulging of the eardrum or perforation and discharged. Ear pain was labeled as continuous pinching of the ear as described by the child or his/her caregiver/parents. Dizziness was described as vertigo. Irritability was named when there was excessive crying. Restless sleep was labeled as inability to sleep properly at night and/or sleep with frequent awakenings. Diminished appetite was described as decreased intake of mild and/or other foods. Ear discharge was labeled in case where it was visible pus coming out of ear. A specially formed proforma was used to record study data.

All the study data was entered into SPSS version 26.0 for statistical analysis. Quantitative data like age (years), duration of fever (days) and highest degree of recorded fever (°F) were represented as mean and standard deviation (SD). Qualitative variables like gender, symptoms and prevalence of AOM were shown as frequency and percentages. Effect modifiers like age, gender, duration of fever, maximum documented fever and symptoms were controlled through stratification while post-stratification chi-square test was applied to the not their effect on the outcome (prevalence of AOM). P value < 0.05 was taken as of statistical significance.

RESULTS

In a total of 118 children, 67 (56.8%) were male. Mean age was noted to be 4.9±4.2 years (ranging between 2 to 12 years) and 62 (52.5%) children were aged between 2 to 5 years. Mean duration of fever was 6.20±1.7 days (ranging between 3 to 9 days) while 75 (63.6%) children had duration of fever above 5 days. Mean maximum reported fever was 103.04±1.1 °F. Irritability, dizziness, restlessness and diminished appetite were the most frequent symptoms noted in 98 (83.1%), 67 (56.8%), 61 (51.7%), and 58 (49.2%) patients respectively. Table-1 is showing characteristics of all febrile children included in this study.

The prevalence of AOM was observed in 27 (22.9%) febrile children. Table-2 is showing distribution of demographical and clinical characteristics of febrile children with respect to prevalence of AOM. It was revealed that AOM was not having any significant association ($p>0.05$) with gender, age groups, duration of symptoms, maximum reported fever and various symptoms reported except presence of irritability ($p=0.003$).

Table-1: Demographic and Clinical Characteristics of Febrile Children (n=118)

Characteristics	Number (%)
Gender	
Male	67 (56.8%)
Female	51 (43.2%)
Age Groups (years)	
2-5	62 (52.5%)
5-10	36 (30.5%)
10-12	20 (16.9%)
Duration of Symptoms (days)	
≤5	43 (36.4%)
>5	75 (63.6%)
Maximum Reported Fever (°F)	
≤102	24 (20.3%)
>102	94 (79.7%)
Frequency of Symptoms	
Ear Rubbing	39 (33.1%)
Irritability	98 (83.1%)
Restlessness	61 (51.7%)
Diminished Appetite	58 (49.2%)
Excessive Crying	39 (33.1%)
Ear Pain	57 (48.3%)
Dizziness	67 (56.8%)
Ear Discharge	51 (43.2%)

Table-2: Distribution of Demographic and Clinical Characteristics of Febrile Children with Respect to Prevalence of Acute Otitis Media (n=118)

Characteristics	Acute Otitis Media		P-Value
	Yes (n=27)	No (n=91)	
Gender			0.884
Male	15 (55.6%)	52 (57.1%)	
Female	12 (44.4%)	39 (42.9%)	
Age Groups (years)			0.566
2-5	16 (59.3%)	46 (50.5%)	
5-10	6 (22.2%)	30 (33.0%)	
10-12	5 (18.5%)	15 (16.5%)	
Duration of Symptoms (days)			0.196
≤5	7 (25.9%)	36 (39.5%)	
>5	20 (74.1%)	55 (60.4%)	
Maximum Reported Fever (°F)			0.417
≤102	4 (14.8%)	20 (22.0%)	
>102	23 (85.2%)	71 (78.0%)	
Frequency of Symptoms			
Ear Rubbing	8 (29.6%)	31 (34.1%)	0.667
Irritability	17 (70.4%)	81 (89.0%)	0.003
Restlessness	16 (59.3%)	45 (49.5%)	0.370
Diminished Appetite	15 (55.6%)	43 (47.3%)	0.449
Excessive Crying	8 (29.6%)	31 (34.1%)	0.667
Ear Pain	17 (63.0%)	40 (44.0%)	0.083
Dizziness	12 (44.4%)	55 (60.4%)	0.141
Ear Discharge	15 (55.6%)	36 (39.5%)	0.141

DISCUSSION

Fever is known to be the most frequent mode of presentation among children in the pediatric emergency department. Appropriate evaluation and management of febrile children is considered vital to reduce the progression of underlying illness.⁹ In the last couple of decades, various practice guidelines have labeled temperature 100.4 °F and 102.2 °F as the two most critical points influencing the treatment decisions among febrile children.^{10,11} In the present study, we marked temperature above 100.4 °F as fever so the described labeling of fever in the present study was according to the published practice guidelines. The temperature of 102.2 °F is considered to be the most commonly endorsed point where pediatricians are prompted for a high degree of suspicion about the bacterial infections.¹²

Epidemiological studies analyzing incidence of AOM often present physician's diagnosis of AOM as a proxy for the community incidence of AOM in a specific population.¹³ In a developing country like Pakistan, parents are perceived to be unable to access healthcare facilities when their children are developing symptoms related to AOM so the reported prevalence of AOM in our parts of the world may not fully represent the exact extent of the AOM. In this study, we noted the prevalence of AOM among febrile children as 22.9% which is nearly 1/4th of studied cases. A multinational, retrospective, observational study analyzing data from Saudi Arabia, Oman, Pakistan and Turkey found incidence of AOM among children aged below 5 years to be 207, 105, 138 and 99 per 1000 respectively.¹⁴ Large epidemiological data from developing countries estimated prevalence of otitis media in Nigeria, Egypt, China, India, Iran and Russia to be 9.2%, 10%, 6.7%, 9.2%, 9.1% and 7.8% respectively.¹⁵ All these studies

including the present one shows that despite significant variation regarding the prevalence of AOM among children, the overall burden of AOM among pediatric age groups in general and in febrile children in specific is considerably high. A study from Brazil reported 67.4% of children with AOM to have fever.¹⁶

We found that Irritability, ear pain, restlessness were the commonest reported symptoms among febrile children with AOM. Researchers have indicated that parents describing otitis media among children frequently report fever, crying or restlessness as the most common symptoms.^{17,18}

There were few limitations of this study as well. As this was a single center study conducted on a limited set of patients, our findings cannot be generalized and further metacentric studies enrolling large sets of febrile children should be planned to further establish the prevalence of AOM among febrile children. In this study, only irritability was noted to have significant association with the diagnosis of AOM, relatively small sample size could have influenced the findings which did not let us find factors associated with AOM among febrile children in this study. As majority of the symptoms were reported by the parents, bias in reporting could also have influenced the proportion of most frequent symptoms of AOM among febrile children.

CONCLUSION

The prevalence of acute otitis media among febrile children was high. High index of suspicion for acute otitis media should be made whenever febrile children are presenting to pediatric healthcare facilities.

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