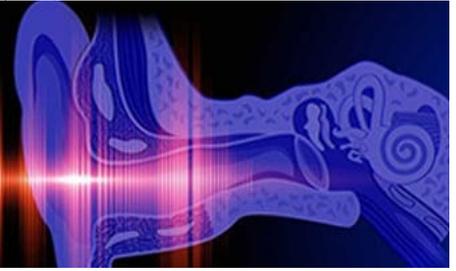


International Journal of Otolaryngology Research



ISSN Print: 2664-6455
ISSN Online: 2664-6463
IJOR 2024; 6(1): 01-05
www.otolaryngologyjournal.in
Received: 05-11-2023
Accepted: 07-12-2023

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Clinicians perspectives on cefpodoxime in acute otitis media

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DOI: <https://doi.org/10.33545/26646455.2024.v6.i1a.33>

Abstract

Background: Although cefpodoxime has been studied for use in acute otitis media and has good antimicrobial activity, there isn't an expert opinion study available for Indian patients for this indication. So, this study was conducted to gather clinicians' perspectives regarding the use of antibiotics, with a special focus on the use of cefpodoxime for the management of acute otitis media in Indian settings.

Methodology: A cross sectional, questionnaire-based study was conducted to collect opinion among doctors on acute otitis media practiced in India between June to December 2022. Convenient sampling method was used.

Results: Overall, it was reported that almost half of the respondents with AOM was seen most common in the age group of 5-10 years. Nearly two-third of the doctors surveyed (67%) preferred cefpodoxime for AOM where 67.3% of clinicians recommended cefpodoxime for 5-7 days and nearly 19% of them prescribe cefpodoxime for 7-10 days. About 57% of doctors believed the cure rate exceeds 80% whereas 21% of doctors reported the cure rate with cefpodoxime was the tune of 60-80%. It was highlighted that the cure rate proportion was as high as 73% with cefpodoxime whereas it was limited to 10% with amoxicillin + clavulanic acid and only 4% with both cefpodoxime and amoxicillin + clavulanic acid. Almost half of the clinicians highlighted that the percentage compliance with antibiotics was up to 90%. The clinicians also pointed out that better cure rate (50%), clinical improvement (48%) and better efficacy (39%) were associated with cefpodoxime.

Conclusion: It was noted that cefpodoxime was the most preferred choice for the management of AOM patients among clinicians. Despite its superior cure and improvement rate among other antibiotics, cefpodoxime was opted for its better tolerability, lesser frequency of administration, improved adherence and decreased gastrointestinal adverse effects.

Keywords: Acute otitis media, oral antibiotics, cefpodoxime, tonsillopharyngitis, middle ear infections

Introduction

One of the most common conditions in the early stages of infancy and childhood is acute otitis media (AOM). It is characterized by the presence of middle ear effusion and the quick onset of middle ear inflammation signs and symptoms, like fever, otorrhea, and ear pain^[1]. By the time they are three years old, over two-thirds of children are thought to have had one or more AOM attacks^[2-4]. The incidence peaks between the ages of 6 and 24 months and declines with age^[5]. The adaptive and native immune systems, eustachian tube dysfunction, viral and bacterial load, as well as genetic and environmental factors, are all involved in the multifactorial pathophysiology of AOM^[2]. It has been suggested that bacteria are mostly accountable for the symptoms associated with AOM^[4, 6].

The perspective that AOM management perceived has been changing gradually. The most recent advances in science regarding AOM and its appropriate management remain the primary focus of current studies. Serious complications can arise from improper treatment or untreated cases of AOM, particularly in children younger than two years of age^[7]. Further, mastoiditis and other complications continue to be the most common cause of death from otitis media in the developing world^[8]. To ensure an early recovery and prevent additional complications, appropriate antibiotics with a high sensitivity level must be started at the primary care level as soon as possible.

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Since fluoroquinolones are becoming increasingly resistant to antibiotic use as a result of widespread over-the-counter use in developing nations like India [9], amoxicillin and clavulanic acid continue to be the primary antibiotics of choice for otitis media due to their high concentration in middle ear fluid [10].

Cephalosporins, such as cefpodoxime, are an antibiotic that was commonly used and has a good side effect profile, tolerance, and patient compliance [8]. Although it has been studied for use in acute otitis media and has good antimicrobial activity, there isn't an expert opinion study available for Indian patients for this indication. So, this study was conducted to gather clinicians' perspectives regarding the use of antibiotics, with a special focus on the use of cefpodoxime for the management of acute otitis media in Indian settings.

Materials and Methods

We carried out a cross sectional, multiple-response questionnaire based survey among clinicians specialized in treating AOM patients in the major Indian cities from June 2022 to December 2022.

Questionnaire

The questionnaire booklet titled CORE (Cefpodoxime in Acute Otitis Media: An Expert's Perspective) study was sent to the physicians who were interested to participate. The CORE study questionnaire included 19 items about current recommendations, clinical observations, and clinical experience of specialists in the management of AOM with cefpodoxime. The study was conducted after receiving approval from Bangalore Ethics, an Independent Ethics Committee which was recognized by the Indian Regulatory Authority, Drug Controller General of India.

Participants: An invitation was sent to leading clinicians in

managing AOM in the month of March 2022 for participation in this Indian survey. 121 doctors from major cities of all Indian states representing the geographical distribution shared their willingness to participate and provide necessary data. Clinicians were asked to complete the questionnaire booklet without discussing with their peers. A written informed consent was obtained from each clinician's prior initiation of the study.

Statistical analysis

The data were analyzed using descriptive statistics. Categorical variables were presented as percentages to depict their distribution. The frequency of occurrence and the corresponding percentage were used to represent the distribution of each variable. To visualize the distribution of the categorical variables, pie, and bar charts were created using Microsoft Excel 2013 (version 16.0.13901.20400).

Results

It was observed that nearly 56% of clinicians seen the symptoms of upper respiratory tract infections (URTI) among adults, 31.3% of them noted among children and 12% of physicians in both children and adults. About 40% of respondents reported that they encounter AOM most frequently in 10-20 patients per month. Additionally, 28% of clinicians see more than 30 patients per month. Almost half of the respondents (48%) reported that AOM was seen most common in the age group of 5-10 years. The next most prevailing age group with AOM was 1-5 years as cited by 20% of respondents followed by 10-15 years' age group from another 20% of respondents (Figure 1). Otagia was the most common symptom of 50%, followed by fever (14%), otorrhea (10%). Another 8% highlighted both fever and otalgia while 7% mentioned all 3 (fever, otalgia and otorrhea).

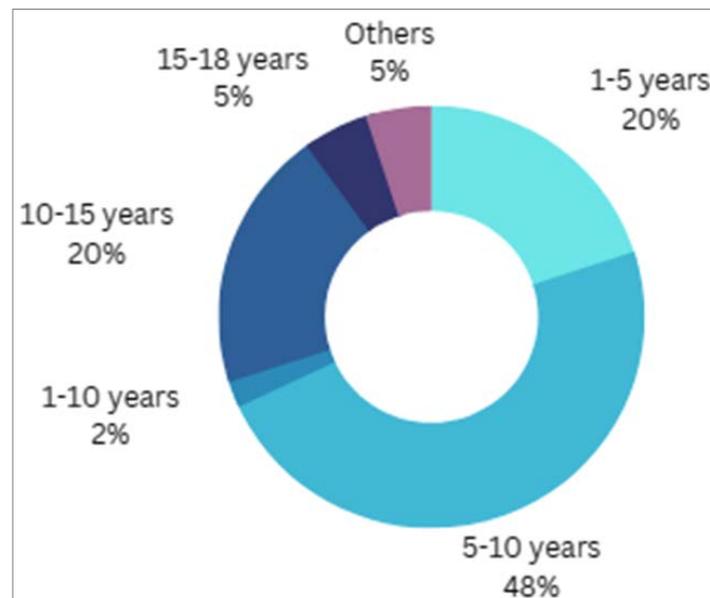


Fig 1: Distribution of prevalence of age group with Acute Otitis Media

Nearly two-third of the doctors surveyed (67%) preferred cefpodoxime for AOM. Another 15% of respondents preferred amoxicillin + clavulanic acid while 12% of doctors preferred cefpodoxime and amoxicillin + clavulanic acid for the management of AOM (Figure 2). In that, 67.3%

of clinicians recommended cefpodoxime for 5-7 days while nearly 19% of them prescribe cefpodoxime for 7-10 days. Only 5% of clinicians each prefer less than 5 days and more than 10 days (Figure 3).

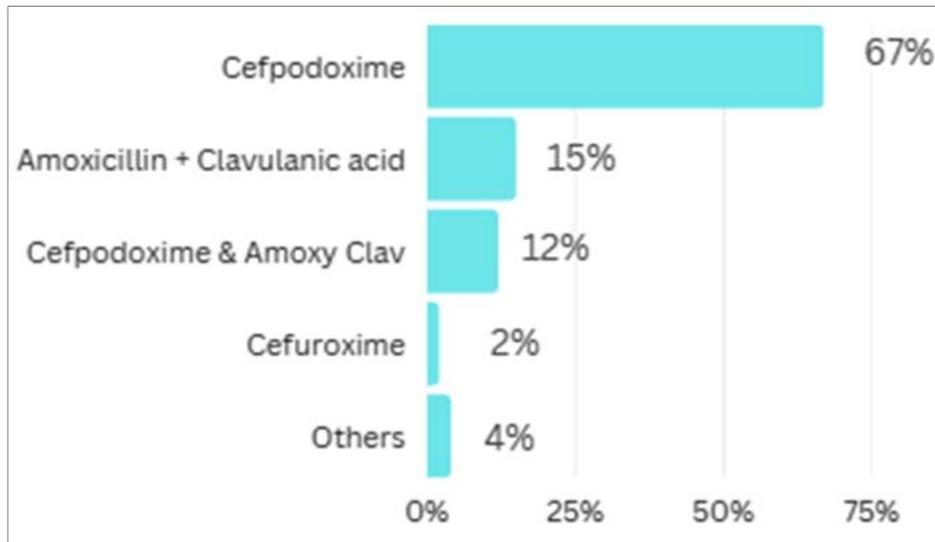


Fig 2: Distribution of preferred drug for AOM among clinicians

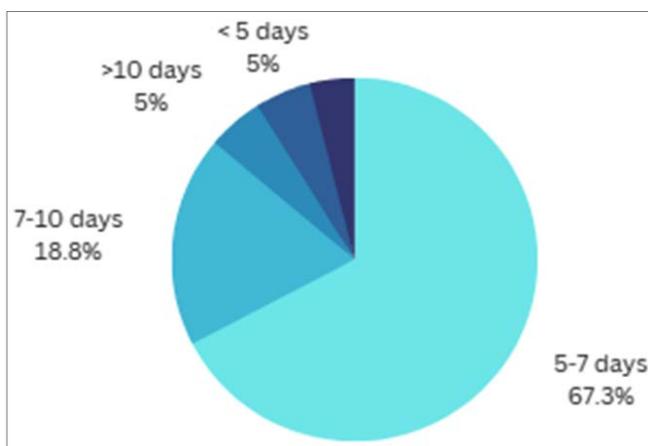


Fig 3: Distribution of Cefpodoxime dosage duration among practitioners

According to this study, 57% of doctors believed the cure rate exceeds 80%. Another 21% of doctors reported the cure rate with cefpodoxime was the tune of 60-80%. Besides, 17% of physicians mentioned that the cure rate was around 60-80%. However, 55% of respondents have experienced diarrhoea as major side effect. Besides, 27% of them reported nausea and vomiting as the next most experienced side effect, 9% of physicians also experienced the side effect of rash.

Among the benefits experienced by clinicians, the improved healing rate, minimum inhibitory concentration (MIC) 90 for common pathogens and penetrating in middle ear fluid were the main advantages experienced by 74% of doctors, while 24% of doctors experienced these benefits individually. Otitis media, pharyngitis and sinusitis were the top 3 indications with 26% of doctors surveyed each with 17% of doctors mentioned tonsillitis as the next most seen URTI indications. Moreover, 58% of physicians highlighted that the most common etiology was bacterial, while 36% was viral. In addition, 4% of clinicians reported that bacterial and viral infections were both the etiology of URTIs.

Over 40% of doctors mentioned that 21-50% of adults affected with AOM. Besides, one third of doctors pointed

out around 20% of adults were with complained with AOM and notably 20% of clinicians highlighted 51-70% of adults were with AOM. The survey reported 12% of physicians considered broad spectrum as the advantage of cefpodoxime, 8% marked good bacteriological and clinical efficiency while 74% reported all of these advantages. Furthermore, 16% of clinicians considered cefpodoxime for 76% to 100% (all) their patients. About 42% of doctors considered cefpodoxime among 51-75% of patients and 28% of doctors prefer cefpodoxime among 26-50% of their patients (Figure 4).

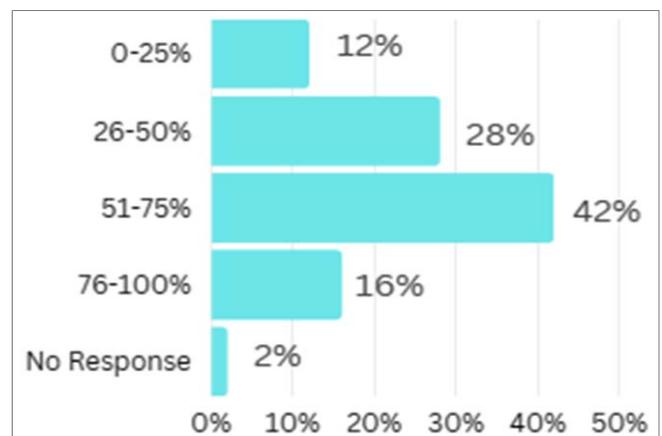


Fig 4: Distribution of clinician's preference of cefpodoxime among the proportion of patients with AOM

About 32% of clinicians prescribed cefpodoxime for tonsillopharyngitis, 25% of them recommended cefpodoxime to sinusitis and tonsillopharyngitis while 21% of them prescribed cefpodoxime to AOM. The study revealed that diarrhoea (35%) and vomiting (26%) were the major side effects with cefpodoxime while 26% of respondents did not experience any side effects. It was highlighted that the cure rate proportion was as high as 73% with cefpodoxime whereas it was limited to 10% with amoxicillin + clavulanic acid and only 4% with both cefpodoxime and amoxicillin + clavulanic acid (Figure 5). Interestingly, 2% of them preferred cefuroxime.

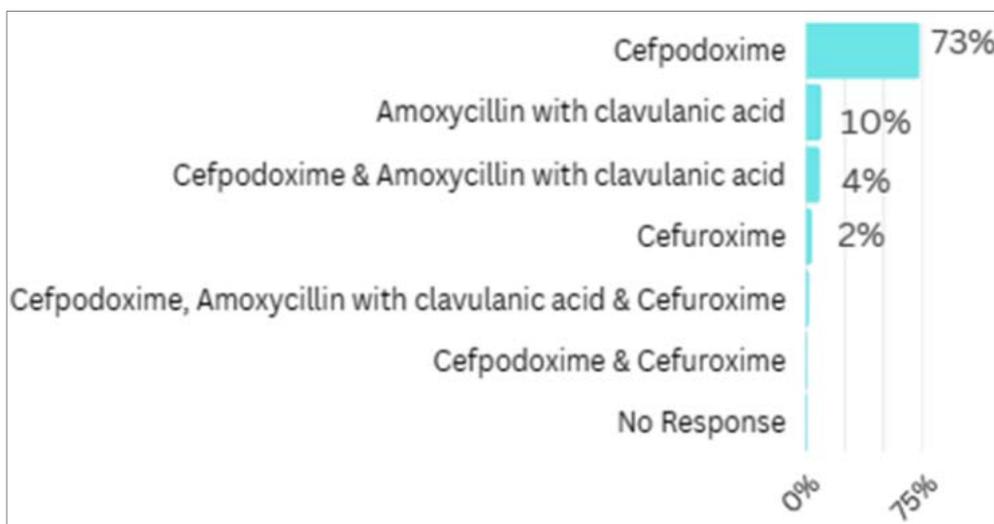


Fig 5: Distribution of proportion of cure rate with cefpodoxime among clinicians

About half of the clinicians highlighted that the percentage compliance with antibiotics was up to 90%. Only 25% of doctors responded the compliance was up to 60%. The respondents reported that better cure rate (50%), clinical improvement (48%) and better efficacy (39%) were associated with cefpodoxime (Figure 6).

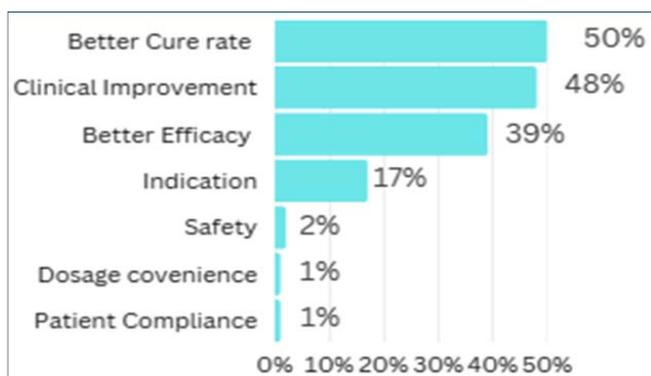


Fig 6: Distribution of proportion of clinician's perspectives on the use of cefpodoxime

Discussion

Primary-care physicians often treat acute otitis media, a community-acquired respiratory tract infection, because all AOM pathogens are becoming more resistant to the standard first-line recommended antibiotics, choosing the most effective antimicrobial to treat AOM has become more challenging in recent years. It was best to use cephalosporins with beta lactamase stability as an empirical treatment, particularly in patients who were allergic to penicillins [11, 12]. According to the American academy of pediatrics (AAP) guidelines, cefpodoxime was one of three oral third-generation cephalosporins that should be used for empirical antibiotic treatment of AOM [1]. In this study, it was highlighted that otalgia was the most common symptom followed by fever and otorrhea which was similar to Bansal C *et al.* where otalgia was noted in 93.6% of their study participants followed by otorrhea and fever [13]. In addition, some clinical studies reported that purulent discharge, erythematous tympanic membrane, nasal discharge, sore throat, cough and pharyngitis were reported as the symptoms associated with it [14, 15].

Nearly two-third of the study respondents preferred cefpodoxime as the primary agent for the management of AOM. Also, American academy of pediatrics (AAP) guidelines recommended cefpodoxime should be used for empirical antibiotic treatment [1]. Further, 67.3% of clinicians recommend cefpodoxime for 5-7 days and nearly 19% of them prescribed cefpodoxime for 7-10 days. In line with this, Abhay K singh *et al.* highlighted that the treatment with cefpodoxime for 5-10 days had superior efficacy among AOM patients [15].

Over 57% of doctors believed the cure rate with cefpodoxime exceeds 80% and 21% of doctors reported the cure rate with cefpodoxime was the tune of 60-80%. It was consistent with previous cefpodoxime clinical studies that reported an 86%-95% overall combined cure and improvement rate [16-18]. Furthermore, this can be corroborated by the findings of two other earlier trials, which found that cefpodoxime outperformed cefixime and amoxicillin-clavulanate in terms of both clinical efficacy and cure rates [17, 19].

It was notable that 55% of respondents have experienced diarrhoea as major side effect. Besides, 27% of them reported nausea and vomiting as the next most experienced side effect, and 9% of physicians also experienced the side effect of rash. Some studies have shown that cefpodoxime was well tolerant in majority of patients and only a small number of patients reported gastrointestinal side effects such as diarrhoea, nausea and vomiting, and then skin rash [14, 15]. Contrarily, in one study, it was highlighted that cefpodoxime has lower incidence of gastrointestinal adverse effects compared to amoxicillin [8].

Since patient compliance directly correlates with medication efficacy and has an inverse association with drug administration frequency [20]. Likewise, it was noted that half of the clinicians highlighted that the percentage compliance with antibiotics was up to 90% where the cefpodoxime twice daily dosage further enhanced the adherence. Moreover, it was proven by M.H. El-Shabrawi *et al.* that patients who were prescribed with cefpodoxime shown improved adherence as compared to amoxicillin-clavulanate and cefaclor [14]. It was significant that cefpodoxime was the most effective agent in the management of AOM as highlighted in this study, where it was supported by several clinical studies of highest cure rate and improvement rate.

Since this study finding offer valuable insights to optimize patient care for AOM by the use of a carefully designed and validated questionnaire for gathering expert data and it was the major strength of the study. Since personal perspectives and preferences might have influenced the conclusion, the dependence on expert judgments establishes the possibility of bias. Observing the results while keeping these limitations in mind was essential, and further research should be undertaken to confirm and broaden the scope of the current survey findings.

Conclusion

In conclusion, it was found that cefpodoxime was the most preferred choice for the management of AOM patients among clinicians. Despite its superior cure and improvement rate among other antibiotics in AOM, cefpodoxime was opted for its better tolerability, lesser frequency of administration, improved adherence and decreased gastrointestinal adverse effects.

Acknowledgments

We would like to thank all the practitioners who were participated in this study.

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How to Cite This Article

Manjula S, Krishna KM. Clinicians perspectives on cefpodoxime in acute otitis media. *International Journal of Otolaryngology Research*. 2024;6(1):01-05.

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