International Journal of Medical Science and Clinical Invention 11(7): 7217-7222, 2024
DOI:10.18535/ijmsci/v11i7.06
https://valleyinternational.net/index.php/ijmsci

Expert Perspectives on the Prescription Pattern of Co-Amoxiclav in the Management of Infections in Indian Settings

Manjula S*, Krishna Kumar M

Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India
***Corresponding author**
Dr Manjula S,
Sr. Vice President,
Department of Medical Services, Micro Labs Limited, Bangalore.
ORCiD Id: 0000-0001-9402-7244

Abstract

Background: Understanding the prescription pattern of antibiotics is crucial for addressing antibiotic resistance and improving public health outcomes. The current survey-based study was intended to gather expert opinions regarding the use of co-amoxiclav in the management of infections in Indian settings.

Methodology: The cross-sectional study utilized an 18-item, multiple-response questionnaire to gather expert opinions from specialists with expertise in managing infections. The survey encompassed questions about current prescription practices, clinical observations, preferences, and experiences related to using co-amoxiclav tablets in the management of infections in routine settings. The data were analyzed using descriptive statistics.

Results: About 83% of clinicians preferred prescribing co-amoxiclav as first-line therapy for respiratory tract infections (RTIs). Most (87.17%) of the clinicians responded that amoxicillin 500 mg + clavulanic acid 125 mg tablet was more effective in treating upper RTIs than other antibiotics. Majority of the experts (94.12%) prescribed co-amoxiclav antibiotics most often for infection in their daily routine practices. Approximately 78% of the clinicians opined that RTIs were the most common type of bacterial infections that were treated with amoxicillin 500 mg + clavulanic acid 125 mg tablets. According to 73% of clinicians, the advantages of amoxicillin + clavulanic acid tablets include broad-spectrum activity, favorable pharmacokinetic profile, and good bacteriological and clinical efficacy.

Conclusion: According to the survey findings, co-amoxiclav was the preferred choice for treating RTIs and other infections due to its broad-spectrum activity, favorable pharmacokinetic profile, and high efficacy.

Keywords: Upper respiratory tract infections, Co-amoxiclav, Infections, Bacterial infections

Introduction

Infections stand as a formidable challenge to global health, contributing significantly to both illness and mortality rates worldwide. Approximately 25% of the estimated 60 million annual global deaths were attributed to infectious diseases.[1] Within this realm, respiratory tract infections (RTIs) emerge as a prominent concern, representing the most fatal infectious diseases and ranking as the fourth leading cause of death globally.[2] In 2019, approximately 26 lakh patients succumbed to RTIs globally. The COVID-19 pandemic has resulted in over 567 million confirmed cases and over 6.3 million deaths worldwide.[3] Additionally, in 2019, upper respiratory tract infections (URTIs) accounted for a staggering 17.2 billion cases globally, comprising 42.83% of all reported cases.[4-6] Urinary tract infections (UTIs) are another prevalent bacterial disease affecting individuals across all age groups, from neonates to the elderly. Annually, approximately 150 million individuals worldwide were diagnosed with UTIs. Notably, women face a substantially higher risk, with a lifetime incidence rate of 60% compared to men (13%).[7]

In the Indian context, severe acute respiratory infections (SARIs) represent a significant burden, accounting for 18% of the global population and standing as the leading cause of mortality in

children over 5 years old. Particularly in low-income countries, SARIs constitute the primary cause of death.[4]

Co-amoxiclav, a combination of amoxicillin and clavulanic acid, was indicated for the management of a wide range of bacterial infections, including those caused by beta-lactamase-producing strains. Amoxicillin, a beta-lactam antimicrobial, acts by inhibiting the biosynthesis of the peptidoglycan layer of the bacterial cell wall. Clavulanic acid was often used in conjunction with amoxicillin to prevent bacterial destruction of beta-lactams. It acts by binding and deactivating the beta-lactamases, thus restoring the antimicrobial effects of amoxicillin.[8] Co-amoxiclav was developed to address the growing resistance to amoxicillin due to the emergence of beta-lactamase-producing bacterial strains.[9] Co-amoxiclav was effective for a variety of infectious diseases, including acute otitis media, sinusitis, pneumonia, UTIs, RTIs, and infections of the skin and soft tissues.[10] Co-amoxiclav was well-absorbed orally, with an oral bioavailability of approximately 60%.[11]

Regular surveillance and monitoring are crucial for providing physicians with updated information on the most effective empirical treatment for bacterial infections, as drug resistance among bacterial pathogens changes with time and place.[7] Understanding the prescription pattern of antibiotics in Indian settings is crucial for addressing antibiotic resistance, improving public health outcomes, optimizing treatment, promoting education and awareness, and guiding policy development in the field of antimicrobial stewardship. The present cross-sectional survey aimed to gather expert opinion on the prescription practice of co-amoxiclav, for the management of infections in Indian settings.

Methodology

We carried out a cross sectional study among Clinicians involved in the management of infections in the major Indian cities from June 2023 to December 2023. 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.

An invitation was sent to leading specialists in managing infections in the month of March 2023 for participation in this Indian survey. About 187 experts from major cities of all Indian states representing the geographical distribution shared their willingness to participate and provide necessary data. The questionnaire booklet titled ACER (Co-amoxiclav in management of infections: An Indian perspective study) study was sent to the physicians who were interested to participate. The ACER study questionnaire consisted of 18 questions addressing current feedback, clinical observations, and the clinical experience of specialists in managing infections using co-amoxiclav in routine settings. Clinicians had the option to skip any questions they preferred not to answer. They were instructed to complete the survey independently, without consulting their colleagues. Written informed consent was obtained from all participants before the study commenced.

The data were analyzed using descriptive statistics. Categorical variables were presented as percentages to provide a clear insight into 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, graphs, and pie charts were created using Microsoft Excel 2013 (version 16.0.13901.20400).

Results

Among the 187 clinicians surveyed, 83% preferred prescribing co-amoxiclav as first-line therapy for RTIs (Table 1). As reported by 41% of the clinicians, co-amoxiclav was prescribed to 51 to 75% of patients with URTIs. Approximately 36% of clinicians reported that pharyngitis was the most common presenting URTI in patients. About 40% of clinicians reported that 31 to 40% of patients present with bacterial etiology of URTI.

Table 1: Distribution of response on the indications for which co-amoxiclav prescribed as first-line therapy

Indications	Response rate (n = 187)
Respiratory tract infections	83.42%
Urinary tract infections	4.28%
Skin and soft tissue infections	4.81%
All of the above	1.07%
Dental infections	5.35%

Acute otitis media	0.53%
Periapical abscess	0.53%

Most clinicians (87.17%) indicated that amoxicillin 500 mg + clavulanic acid 125 mg was more effective in treating URTIs than other antibiotics (Table 2). Nearly 44% of clinicians reported that patients rarely experience side effects when receiving amoxicillin 500 mg + clavulanic acid 125 mg. As reported by 49% of respondents, prescribing supportive care measures was the ideal strategy to manage side effects or adverse reactions in patients receiving amoxicillin 500 mg + clavulanic acid 125 mg.

Table 2: Distribution of response on the effectiveness of amoxicillin 500mg + clavulanic acid 125mg in treating URTI compared to other antibiotics

Effectiveness	Response rate (n = 187)
More effective	87.70%
Equally effective	11.23%
Less effective	1.07%

Approximately 49% of clinicians preferred prescribing amoxicillin 500 mg + clavulanic acid 125 mg over another antibiotic for a given patient based on suspected or confirmed bacterial pathogens, while 45% responded to prescribing based on the patient's medical history and comorbidities. Majority of the clinicians (94.12%) preferred prescribing co-amoxiclav most frequently for managing infections in routine practice (Fig. 1). Around 44% of clinicians stated prescribing co-amoxiclav due to common antibiotic resistance patterns in different areas. Approximately 78% of clinicians opined that RTIs were the most common type of bacterial infections treated with amoxicillin 500 mg + clavulanic acid 125 mg tablet (Fig. 2). According to 73% of the clinicians, the advantages of amoxicillin + clavulanic acid include broad spectrum activity, favorable pharmacokinetic profile, and good bacteriological and clinical efficacy (Fig. 3).

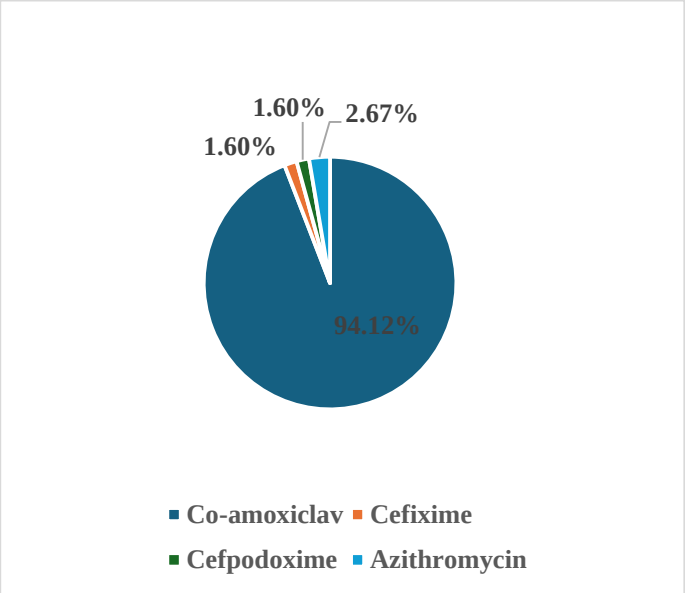

Fig. 1: Distribution of response on the most common antibiotics prescribed for routine infections

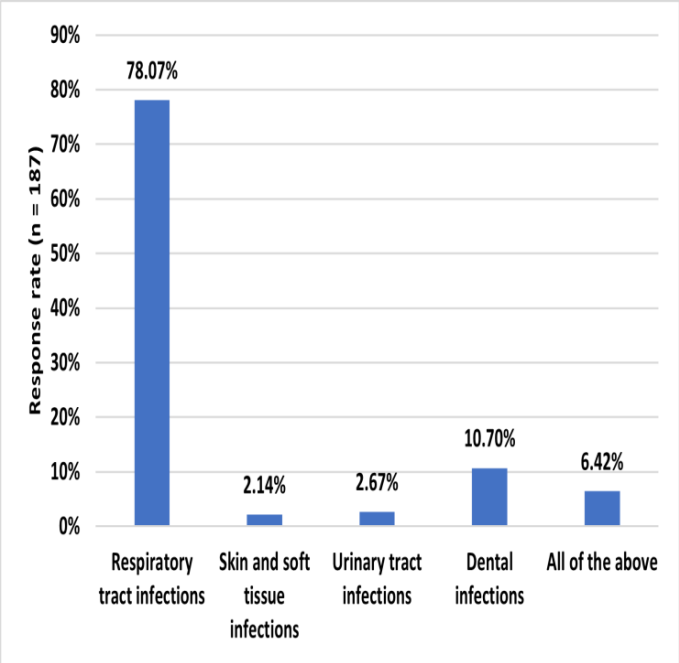

Fig. 2: Distribution of response on the bacterial infections treated with amoxicillin 500 mg + clavulanic acid 125 mg

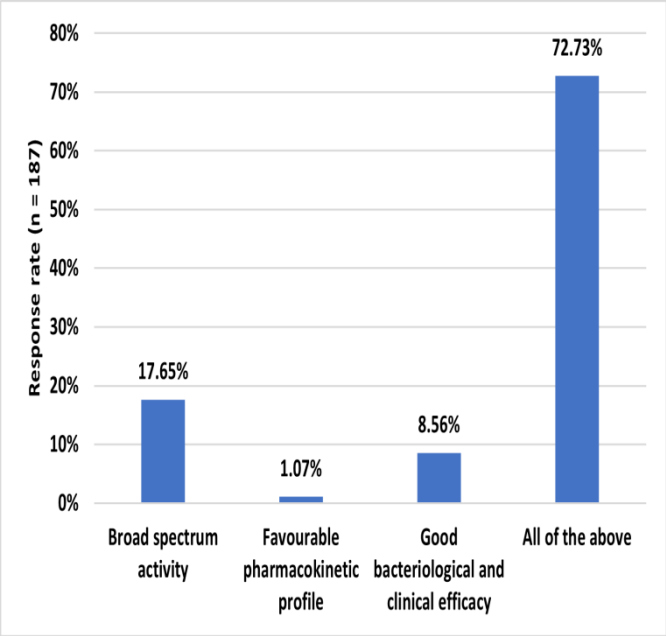

Fig. 3: Distribution of response on the advantages of amoxicillin + clavulanic acid

Approximately 49% of the respondents opined that there was no need to switch antibiotics from co-amoxiclav to different antibiotics due to lack of efficacy. The notable difference in efficacy between co-amoxiclav and other commonly prescribed antibiotics was noted where co-amoxiclav was more effective than others, as indicated by 85% of the clinicians. Nearly 50% of the respondents reported that co-amoxiclav treatment shown a response within 24 to 48 hours in treating daily routine infections. Around 42% of the clinicians reported that more than 90% of patients experience complete resolution of symptoms with amoxicillin 500 mg + clavulanic Acid 125 mg compared to other prescribed antibiotics. As indicated by 66% of the clinicians, the recommended duration of co-amoxiclav therapy for uncomplicated UTI was 7 to 10 days. According to 31% and 30% of the clinicians, respectively, culture sensitivity and liver function were the laboratory tests to be monitored in patients receiving long-term co-amoxiclav.

Discussion

The survey-based study provides valuable insights into the management of infections in Indian settings, allowing for the optimization of treatment strategies. By identifying the preferred choice of antibiotic, such as co-amoxiclav, and the rationale behind its usage, clinicians can make informed decisions that ultimately lead to improved patient outcomes and reduced morbidity and mortality rates associated with bacterial infections.

Majority of the survey respondents preferred prescribing co-amoxiclav as first-line therapy for RTIs. Mishra et al. showed that co-amoxiclav prescription as a first-line drug has increased to 73.1%, indicating a marginal improvement of 11.4% for RTIs.[12] Ferrara et al. also reported that co-amoxiclav was the first choice in the moderate and severe presentation of RTIs.[13] Goyal et al. recommended co-amoxiclav as the first-line empirical oral antibiotic treatment for non-severe exacerbations in children with RTIs.[14] Wald et al. also reported that amoxicillin and clavulanate remain the first line of therapy.[15] Malo et al. noted that 70% of all prescriptions for treating RTIs in children involved amoxicillin with clavulanic acid.[16]

The current survey noted that amoxicillin 500 mg + clavulanic acid 125 mg tablets were more effective in treating URTIs than other antibiotics. Consistent with these findings, a comparative study by HM Beumer reported that amoxicillin/clavulanic acid 500 mg/125 mg thrice daily improved the symptoms of RTIs.[17] Additionally, Bucher et al. reported that amoxicillin-clavulanate exhibits excellent activity against bacterial infections in URTIs and acute bacterial rhinosinusitis.[18]

The survey respondents reported that co-amoxiclav was prescribed more often for infections noted in routine practice. Consistent with this, White et al. concluded that co-amoxiclav was an important agent in the treatment of community-acquired RTIs.[19] Studies have shown that amoxicillin-clavulanate was widely recognized as one of the most frequently utilized antimicrobial agents in emergency departments and primary care settings. The combination of amoxicillin and clavulanic acid has demonstrated notable efficacy in combating bacterial infections.[8,20]

Budhiraj et al. reported that amoxicillin + clavulanic acid was one of the most common antibiotics used for RTIs in India.[21] Veeraraghavan et al. reported that oral amoxicillin/clavulanate was commonly prescribed for community-acquired RTIs, skin infections, and UTIs.[11] In a randomized trial by Ferreira et al., the combination of amoxicillin and clavulanic acid resulted in significantly higher cure rates of 61.7% to 93.2% for treating URTIs.[22] The present survey

also reported similar findings on the prescription of co-amoxiclav more often for managing infections in routine practice.

The present survey reported that the advantages of amoxicillin + clavulanic acid include broad-spectrum activity, a favorable pharmacokinetic profile, and good bacteriological and clinical efficacy. Similarly, Seggev et al. noted that amoxicillin + clavulanic acid was as effective and safe as ever for the treatment of acute bacterial infections.[23] Easton et al. reported that the antibiotic combination was also widely used and effective broad-spectrum antibiotic treatment for acute otitis media in children.[24]

Co-amoxiclav stands as a cornerstone in the management of RTIs, reflecting a widespread consensus among clinicians**.** The current survey results can aid clinicians in enhancing treatment strategies and patient care by considering the preferences and prescription practices of co-amoxiclav in Indian settings. The major strength of the current survey is the utilization of a well-designed and validated questionnaire to collect data from clinicians. However, it is important to acknowledge certain limitations of the survey. The results may be subject to bias due to reliance on expert opinion, which can be influenced by diverse perspectives and preferences among clinicians. It is essential to keep these limitations in mind when interpreting the findings. Additionally, the survey may not fully account for emerging evidence or evolving trends in infection management. To address these limitations, it was recommended to conduct prospective trials or real-world observational studies to validate the survey results and provide a more comprehensive understanding of optimal treatment approaches.

Conclusion

The study highlighted clinicians' preference for co-amoxiclav, which consists of amoxicillin 500 mg + clavulanic acid 125 mg tablets, as the first-line therapy for RTIs due to its perceived effectiveness. The broad-spectrum activity, favorable pharmacokinetic profile, and high bacteriological and clinical efficacy attribute to co-amoxiclav being the preferred choice for treating URTIs and other bacterial infections in routine practice.

Source of funding

Nil

Conflict of Interest

Nothing to declare

Acknowledgement

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

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