e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(2); 1436-1438

Original Research Article

The Prevalence of Irrational Antibiotic Prescription among the Allopathic Physicians of Urban Areas of Kerala Region, India- A Cross-Sectional Survey- A Pilot Study

Antony T[1], Savio Vadakutt[2]

[1]Professor, Moopen's Medical College, Wynadu, Kerala, India
[2]Student, Gregorios Dental College, Chelad, Kerala, India

Received: 25-11-2023 / Revised: 23-12-2023 / Accepted: 26-01-2024
Corresponding Author: Dr. Antony T
Conflict of interest: Nil

Abstract:

Antibiotics are invaluable tools in modern medicine, yet irrational prescribing practices contribute to antimicrobial resistance (AMR) globally in addition to the increased burden of treatment cost, which affects the socioeconomic status of the region. With the primary objective to determine the frequency of irrational antibiotic use, this study investigates the prevalence and determinants of irrational antibiotic prescriptions by allopathic physicians in urban regions of Kerala, India, shedding light on factors influencing this concerning trend and proposing strategies for mitigation. The Authors randomly collected one hundred prescriptions for the antibiotic agents from the urban area of Kerala, a Southern state of India, and conducted a prescription audit. The study proves the majority of allopathic antibiotic prescriptions detail rational dose, dosage frequency, and duration of treatment, according to the condition(s) mentioned in the document.

Keywords: Antibiotic use, Irrational prescription, Rational antibiotic use, Irrational antibiotic use.

Introduction

Kerala's urban areas witness a high volume of healthcare activities, often accompanied by antibiotic misuse and overprescription. The widespread irrational consumption of antibiotics in developing countries is of major concern because it fosters new resistant microbial strains which are easily spread within environments where poor sanitary conditions are common and the immune systems of a substantial proportion of the population are compromised [1]. Such practices contribute to the emergence of resistant strains, posing a significant public health threat. It also contributes to the economic impact of excessive and inappropriate consumption of resources, which causes a drain on government financial resources, poor families waste scarce resources on expensive medicines that are not indicated or inadequately dosed (1). Understanding the prevalence and factors associated with irrational antibiotic prescribing is critical to curbing AMR.

Methodology

A cross-sectional study was conducted across diverse urban healthcare settings in Kerala. A hundred numbers of prescriptions for antibiotics were collected randomly from allopathic physicians and carried out prescription auditing to find out the rationality of antibiotic prescriptions. The inclusion criteria were those prescriptions for antimicrobial agents with indicated provisional/ definite diagnosis by allopathic physicians, practicing in the urban areas of Kerala. Parameters such as antibiotic type, dosage, indication, and patient demographics were recorded. The data analysis was carried out using basic biostatic methods following standard guidelines for rational antibiotic use.

Results

This cross-sectional survey identified one hundred prescriptions for antimicrobial agents by allopathic clinicians randomly from the pharmacy outlet in urban regions of Kerala state, India. The frequency of prescription patterns for different antimicrobial agents is shown in Table 1. The analysis of data showed that 27% of prescriptions are inadequately described in terms of dose, frequency of dosage schedule, and duration. 54% of the total prescriptions selected were directed for relatively newer antimicrobial drugs. Out of 27 ill-described prescriptions, 11 showed inadequacy of dose of the agent, 9 prescribed inadequate duration of treatment and seven mentioned inadequate dose and duration for the therapy. 18% of total prescriptions were for broad-spectrum antimicrobials.

Table 1: The percentage of antimicrobials group prescribed.

Penicillin	Cephalosporins	Erythromycin	Tetracycline	Quinolones	others
27%	34%	18%	12%	6%	3%

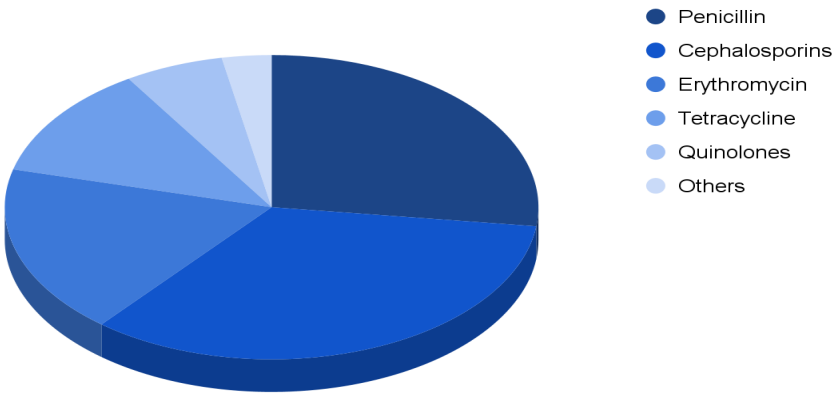

Figure 1:

Table 2: The frequency of inadequate prescriptions

Inadequate Dose	Inadequate frequency	Inadequate duration	Both inadequacy in dose & duration
40.7%	14%	33.3%	12%

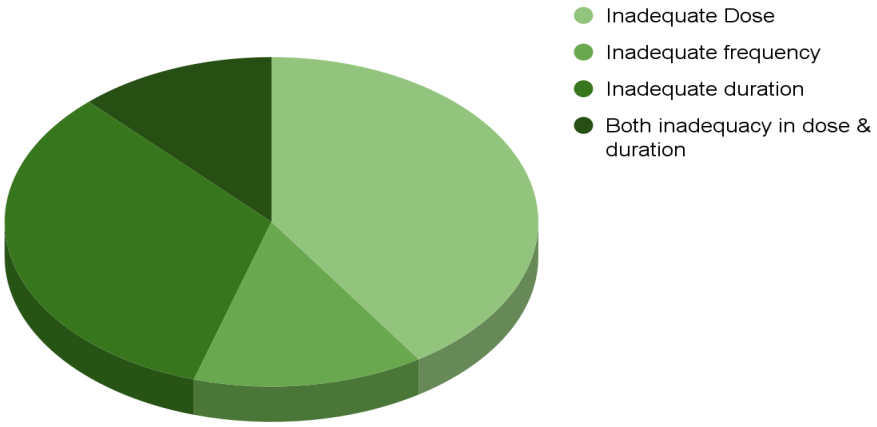

Figure 2:

Discussion:

Irrational antibiotic usage such as inadequate dose, duration, and selection of agents negatively directly influences the effectiveness of therapy, and patient safety and causes the emergence of resistant bacterial strains [2]. The emergence of resistant bacterial strains and infections caused by them results in millions of people dying every year, making antimicrobial resistance a leading cause of death around the world [3]. This global problem continues as the infectious bacteria are no longer vulnerable to antimicrobial agents that worked effectively previously [4]. Prolonged exposure of microorganisms to unnecessary antibiotics can result in the development of diverse resistance mechanisms by these organisms. Consequently, higher doses of antibiotics become necessary to eliminate the infection. It is speculated that if left unchecked, AMR could have large-scale economic repercussions that could even threaten the global economy [5].

In our study, we have evaluated the prescription patterns of medical practitioners in urban areas of Kerala and concluded that around 27% of prescriptions are inadequately described in terms of dose, frequency of dosage schedule, and duration, which are major determinants that lead to the development of antibiotic-resistant strains. Cephalosporins and Penicillin were the most commonly prescribed drugs in our study sample

and that trend corresponds with other cross-sectional studies conducted across South India [6]. Hence, due to their overuse, pathogens are shown to develop resistance to these drug categories [7].

India has limited systems for monitoring antimicrobial consumption [8], But there have been commendable state-level efforts with the development of the Kerala Antimicrobial Resistance Strategic Action Plan (KARSAP) [9]. It outlines the steps involved and general guidelines to curb AMR in the state. This action plan model was later expanded to include other states as well. In addition to these efforts, awareness programs, usage of the WHO AWaRe assessment tool [10], promotion of narrow-spectrum antibiotics, and utilization of newer diagnostic and screening techniques like Antibiotic Susceptibility Test (AST) & Novel Genome Sequencing (NGS) should be incorporated [11].

These advanced techniques have now made pharmacogenomic prescriptions possible [12]. We further plan on conducting a large-scale study to develop a system to document and dispense genome-specific antibiotics which will exponentially increase the therapeutic effectiveness and mitigate the risk of developing AMR.

Conclusion

In this pilot study, conducted to detect the irrational use of antibiotics in the urban population of the southern state of India, Kerala, we observed 27% of irrational prescriptions for antibiotic agents, which is in better figure than the national average. Still, it needs to be improved to ground level.

For the attainment of the above goal, it is required to conduct awareness programs such as CME, and other educational programs for physicians as well as the public.

The major limitation of this study is the limited number of prescriptions audited, so it recommends the inclusion of a higher number of prescriptions for the auditing and categorization based on the specialty of clinical practice. This prescription auditing survey is limited to urban areas of the state, and it is advisable to assess the incidence of irrational antibiotic prescriptions in rural areas and its comparison to urban practice

References

1. Rema Devi Saradamma, Nick Higginbotham, Mark Nichter: Social factors influencing the acquisition of antibiotics without prescription in Kerala State, south India; Social Science & Medicine, Volume 50, Issue 6,2000. Pages 891-903, ISSN 0277-9536.
2. Hossain MJ, Jabin N, Ahmmed F, Sultana A, Abdur Rahman SM, Islam MR. Irrational use of antibiotics and factors associated with antibiotic resistance: Findings from a cross-sectional study in Bangladesh. Health Sci Rep. 2023 Jul 28; 6(8):e1465.
3. Antimicrobial Resistance Collaborators. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. The Lancet; 2022;399(10325): P629-655.
4. Blair JMA, Webber MA, Baylay AJ, Ogbolu DO, Piddock LJV. Molecular mechanisms of antibiotic resistance. Nat Rev Microbiol. 2015; 13(1):42-51.
5. Drug-Resistant Infections: A Threat to Our Economic Future (March 2027) https:// www.worldbank.org/en/topic/health/publication/drug-resistant-infections-a-threat-to-our-economic-future
6. Priyadharsini RP, Ramasamy K, Amarendar S. Antibiotic-prescribing pattern in the outpatient departments using the WHO prescribing indicators and AWaRe assessment tool in a tertiary-care hospital in South India. J Family Med Prim Care. 2022 Jan;11(1):74-78.
7. Kerala becomes the first state to release an antibiogram. - The Hindu https:// www. the-hindu.com/news/national/kerala/kerala-becomes-the-first-state-to-release-an-antibiogram/article66135019. ece#:~: text= It%20also%20showed%20alarmingly%20high, %2C%20mortality%20is%20around%2030%25.
8. Tracking AMR Country Self-Assessment Survey (TrACSS) 2023 WHO Country Report - India. https://www.amrcountryprogress.org/download/profiles/2023/english/EN_IND_ Tr ACSS_2023_India.pdf
9. Kerala Antimicrobial Resistance Strategic Action Plan. One Health response to AMR Containment.https://www.fao.org/faolex/results/details/en/c/LEX-FAOC210471/# :~:text= This%20Kerala%20Antimicrobial%20Resistance%20Strategic,every%20level%20to%20combat%20it.
10. The WHO AWaRe (Access, Watch, Reserve) antibiotic book https://www.who.int/ publications/i/item/9789240062382
11. Lüftinger L, Ferreira I, Frank BJH, Beisken S, Weinberger J, von Haeseler A, Rattei T, Hofstaetter JG, Posch AE, Materna A. Predictive Antibiotic Susceptibility Testing by Next-Generation Sequencing for Periprosthetic Joint Infections: Potential and Limitations. Biomedicines. 2021 Jul 29;9(8):910.
12. Su M, Satola SW, Read TD. Genome-Based Prediction of Bacterial Antibiotic Resistance. J Clin Microbiol. 2019 Feb 27; 57(3):e01405-18.