https://doi.org/10.48047/AFJBS.6.15.2024.120-132

African Journal of Biological Sciences

Journal homepage: http://www.afjbs.com

Research Paper Open Access

A cross-sectional assessment of the prescription pattern of drugs in rural areas of South India

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. Volume 6, Issue 15, Aug 2024

Received: 15 June 2024

Accepted: 25 July 2024

Published: 15 Aug 2024

doi: 10.48047/AFJBS.6.15.2024.120-132

Abstract

Introduction: The irrational use of medicines is a global issue that negatively impacts both the health and the economy of countries. India, in particular, faces the challenge of managing infectious diseases with limited economic resources. Therefore, conducting a drug utilization study is crucial to analyse the prescribing patterns and identify problems associated with medication usage.

Methods: This cross-sectional study examined general practitioners' prescriptions in a rural South Indian area. A total of 545 outpatients who visited clinics over three months were included in the study. All prescriptions from patients of all ages and genders in the specific district were collected, involving general practitioners with MBBS degrees. Only outpatient prescriptions were considered, resulting in a total of 950 prescriptions. Over the counter (OTC) drug details were obtained from the pharmacy register that served the clinic area. Practitioners who did not give consent to participate were excluded.

Results: The analysis revealed that out of the total drug consumption, 89% comprised over the counter (OTC) drugs, while 11% were exclusively prescribed medications. Among the prescribed drugs, 69% were non-antimicrobials, and 31% were antimicrobials. Notably, Proton Pump Inhibitors were highly prescribed, accounting for 69% of non-antimicrobial prescriptions. Among the prescribed antimicrobials, the third-generation cephalosporin, cefixime, was predominantly used, comprising 64% of microbial prescriptions. In the OTC drug category, non-antimicrobials represented 79% of consumption, while antimicrobials accounted for 21%. Additionally, injections constituted approximately 51% of all prescription drugs overall.

Conclusion: This study provides valuable insights into the drug utilization trends and prescription patterns in rural India, which is a vulnerable demographic. It also enables the analysis of appropriate drug dispensing and usage to optimize antimicrobial therapy while promoting generic drug prescriptions.

Keywords: drug prescription, general practitioners, antimicrobial resistance, over-the-counter drugs, parenteral.

Introduction

Irrational use of medicines is a worldwide problem as it has an impact on health as well as the economy of the country. India especially faces a heavier burden of controlling infectious

diseases with limited economic resources. Polypharmacy increases the cost of therapy and decreases the compliance of patients. Drugs prescribed by brand names increase the economic burden on the patient, which is especially detrimental in rural communities [1,2]. Antimicrobial resistance is a widespread issue that is especially difficult to control in developing nations and in rural regions where the transmission of infectious diseases is more common and access to treatment is scarce [3,4]. There are cost constraints to replace older antibiotics with newer and more expensive ones. Appropriate usage of antibiotics will reduce the emergence of resistance while prescribing essential and generic drugs will decrease the economic burden and increase patient compliance [5].

General practitioners (GPs), often known as private medical practitioners, are frequently sought after by the public to cure their common ills. In the sphere of public health, they serve as the primary healthcare providers. GPs are more accessible to the public. They treat a wide range of illnesses as part of basic healthcare, which necessitates the use of a variety of medications from various types [6]. Currently, in India, general practitioners (GPs) are not obligated to adhere to any specific criteria when prescribing medications. However, to ensure accessible and affordable healthcare, analysing prescription patterns is an integral component of medical auditing. This process entails monitoring, evaluating, and implementing necessary modifications to prescribing practices to achieve reasonable and cost-effective medical care. Antibiotic use has increased globally, with middle- and low-income countries accounting for a larger share [7]. Furthermore, several studies have demonstrated a connection between the appearance and spread of resistant microorganisms and rising antibiotic misuse. Additionally, ciprofloxacin resistance rates varied significantly, according to a recent analysis by the Global Antimicrobial Resistance and Use Surveillance System (GLASS). Klebsiella pneumoniae displayed resistance rates ranging from 4.1% to 79.4%, while Escherichia coli demonstrated resistance rates ranging from 8.4% to 92.9% [8]. The advancement of modern medicine in the

treatment of various communicable and non-communicable diseases would be more at risk if antimicrobials were ineffective. Therefore, a drug utilization study will allow us to analyse the pattern of drugs prescribed and detect problems in their usage.

The objective of the study is to analyse the prescriptions dispensed by general practitioners to evaluate the utilization of antibiotics, the inclination towards prescribing generic names, and the utilization of drugs listed in the national essential drug list. To provide a quantitative assessment of drug prescription patterns by general practitioners and evaluate drug utilisation trends among patients in rural areas of South India. To obtain data from the pharmacy regarding the over-the-counter sale of drugs.

Materials and Methods

A cross-sectional observational study was conducted by gathering prescriptions from general practitioners practising in rural areas of Ariyalur district, Tamil Nadu for three months. The study focused on outpatients visiting the clinics, with a sample size of 545 patients. These general practitioners were MBBS graduates, some with specialization diplomas, who operated private clinics in rural locations. Copies of the prescriptions handed over by the general practitioners to the dispensaries were collected and utilized for analysis. Ten private practitioners in the Ariyalur district of Tamil Nādu were randomly selected for the study, and a total of 950 prescriptions from these practitioners were considered for analysis. Information regarding over the counter (OTC) drugs was obtained from pharmacy registers serving the clinic area. Consent was obtained from practitioners who were willing to participate. The collected prescription data was recorded in a proforma sheet specifically designed for the study, which included details such as patient demographics (excluding names), number and types of prescribed drugs (generic or brand name), route of administration, and frequency. Ethical permission to conduct the study in a clinical setting was obtained from the Institutional Ethical

Committee before commencing the research. The study's privacy was protected both during and after the data collection process.

Results

According to total drug consumption, 89% were OTC drugs, and 11% were only prescribed drugs. Among the prescriptions, 69% were non-antimicrobials and 31% were microbials (Figure1).

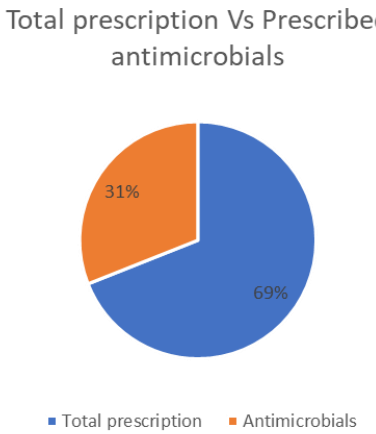

Figure 1: Total prescription vs prescribed antimicrobials

Non-antimicrobials among prescriptions include Proton pump inhibitors, Supplements, Antianxiety drugs, NSAIDS, Antihypertensive, Antitussives, Hypoglycaemic drugs, ORS, Contraceptives, Anticoagulants, Hormones (steroids & antithyroid) were used, of which Proton pump inhibitors (72%) were highly prescribed (Table 1).

Table 1: List of prescribed non-antimicrobials (N=545)

S. No	Prescribed non-antimicrobials	Percentage
1	Proton pump inhibitors	72.80%
2	Supplements	7%

3	Antianxiety drugs	4.60%
4	NSAIDs	3.70%
5	Antihypertensive	3.50%
6	Antitussives	3.40%
7	Hypoglycaemic drugs	2.80%
8	ORS	1.10%
9	Contraceptives	0.50%
10	Anticoagulants	0.40%
11	Hormones (steroids & antithyroid)	0.20%

Antimicrobials among prescriptions include cephalosporins, fluoroquinolones, aminoglycosides, antifungal, antituberculosis, penicillin, topical antibiotics, macrolides, sulphonamides, chloramphenicol, tetracyclines, antiparasitic, antiviral, of which cephalosporins (63%) were highly used.3rd generation cephalosporin was highly prescribed (Table:2) and cefixime was the most prescribed antibiotic by the practitioners (Figure 2).

Table2: List of prescribed antimicrobials (N=545)

S. No	Prescribed antibiotics	Percentage
1	Cephalosporins	62.80%
2	Fluroquinolones	16.70%
3	Aminoglycosides	11.80%
4	Antifungal	2.04%
5	Antituberculosis	1.90%
6	Penicillin	1.40%

7	Topical antibiotics	1.28%
8	Macrolides	0.90%
9	Sulphonamides	0.50%
10	Chloramphenicol	0.14%
11	Tetracyclines	0.09%
12	Antiparasitic	0.09%
13	Antiviral	0.04%

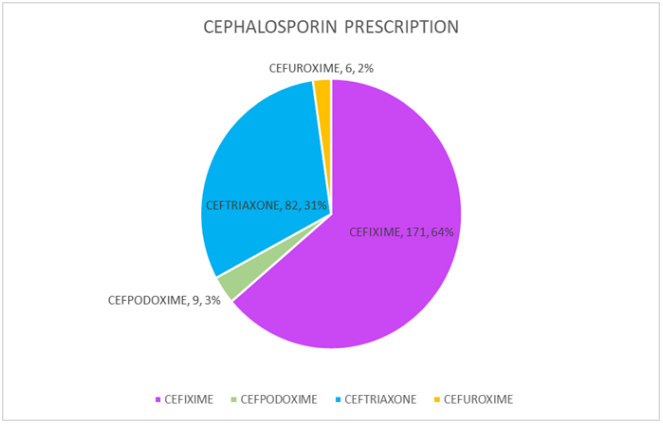

Figure 2: Prescription of cephalosporins

Among the OTC drugs, 79% were non-antimicrobials and 21% were antimicrobials (Figure 3).

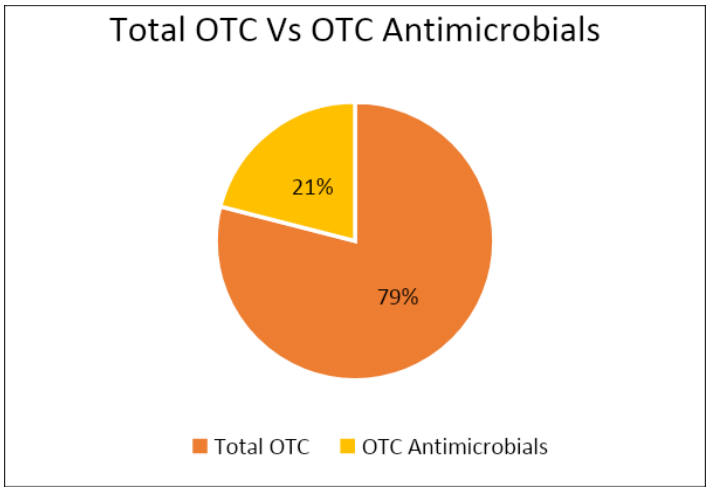

Figure 3: Total OTC vs OTC antimicrobials

Use of injection (51%) is almost equal proportion with oral preparations (49%) (Figure 4).

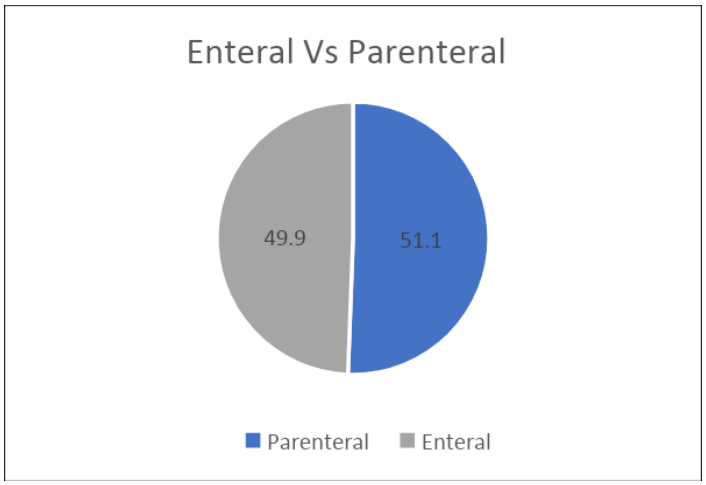

Figure 4: Parenteral vs enteral administration

Who indicators

Percentage of encounters with an antibiotic prescribed = (Number of patient encounters with an antibiotic/ Total number of encounters sampled) × 100 is 31%. Percentage of encounters

with an injection prescribed = (Number of patient encounters with an injection prescribed/Total number of encounters sampled) × 100 is 51% [9,10].

Discussion

Evaluation of prescription patterns has emerged as a potential approach for determining whether medication therapy is suitable. This is crucial for assessment and essential changes to the prescribers' prescribing techniques to obtain sensible and economical medical treatment, doctors who do general practice are usually more accessible to the public. A study by Pandiamunian et al. (2013) showed that in 78% of prescriptions studied, at least one anti-microbial agent was prescribed. The usage of broad-spectrum antimicrobial agents was seen. Further, antibiotics were prescribed for viral infections. Moreover, there is a significant trend to prescribe drugs by brand names rather than generic names. In the same study, 94.67% of drugs were prescribed by their brand names [6].

According to Badar VA et al, the most frequently given antibacterial drug is cefixime, and cephalosporin is the most frequently prescribed class of antibiotics. This is consistent with research on drug use conducted in India [11].

Appropriate usage of antimicrobial agents will reduce antimicrobial resistance, which is a global problem. 42.4% of the prescriptions in a tertiary care hospital in rural areas in Maharashtra are antibiotics [12]. In India, the infectious disease burden is high due to population and economic and educational boundaries. Moreover, there are cost constraints to replace older antibiotics with newer and essentially more expensive ones. Raise awareness among healthcare professionals, patients, and the general public about the risks of antimicrobial resistance and the importance of using these drugs appropriately. Establish antimicrobial stewardship programs in healthcare facilities. These programs are multidisciplinary efforts aimed at optimizing antimicrobial use to improve patient outcomes while minimizing resistance [13,14].

In this study, OTC drug data were collected from the pharmacy catering to the area as a piece of additional information. According to a study by Bhaisare R et al, Prevalence of self-medication in rural areas of Andhra Pradesh, OTC drug consumption is high in rural areas which is like our study [15]. this study data also showed the prescriptions given by the general practitioners were used repetitively without consulting the doctors. The reason for the high consumption of OTC drugs was due to the non-availability of doctors for 24 hours and the ease of getting the drugs from the pharmacy.

Creating awareness among people regarding over the counter (OTC) drug consumption is an important step in promoting responsible and safe usage of drugs [16]. The strategies to raise awareness by developing educational campaigns to inform the public about the risks, benefits, and proper usage of OTC drugs. This can be done through various mediums such as brochures, pamphlets, posters, websites, social media, and community events. Collaboration with healthcare professionals, such as doctors, pharmacists, and nurses, to disseminate accurate information about OTC drugs. They can provide insights on appropriate usage, potential side effects, and the importance of reading labels and following dosing instructions. Collaborate with patient advocacy organizations to spread awareness about OTC drug safety. These groups often have established networks and can help amplify your message to their members and followers. Advocate for clearer and more explicit labelling on OTC drug packages. Encourage manufacturers to include warnings about potential side effects, interactions with other medications, and appropriate usage instructions. Promote the importance of reading labels carefully before using any OTC medication. The key is to provide accurate, accessible, and easy-to-understand information to empower individuals to make informed decisions when using OTC drugs.

The injection was highly used in outpatient setups which is like the study conducted by Anand K et al because of the patient's demand for mental satisfaction and fast relief from their illness

[17]. Addressing the high consumption of injections in rural areas requires a multi-faceted approach. Strategies may include improving access to affordable and quality primary healthcare, enhancing health literacy through targeted education programs, training healthcare providers on evidence-based practices, and promoting the appropriate use of oral medications through awareness campaigns [18]. Additionally, community engagement and involvement, including the participation of local leaders and stakeholders, can help in shifting cultural beliefs and norms around injection usage.

Conclusion

This study indicates that the rural areas in our country need better health care facilities which will help in preventing antimicrobial resistance, a great burden to the country. This study sheds light on the GPs' prescription practices in rural areas. Our findings support the GPs' propensity to overprescribe. GPs need to be encouraged to prescribe medications under their generic names. There should be a warning about this as the WHO recommendations say that not every session needs to end with a prescription for medication. Detailed directions regarding the potential negative effects of the given medications, additional pertinent advice, and patient follow-up should all be included in a prescription. Additionally, general Practitioners need to be aware that antimicrobial resistance is an increasing issue mostly brought on by excessive and unnecessary antibiotic usage. They are used more frequently in cephalosporin because they are less likely to cause resistance. There is a need to sensitize general practitioners to the value of rational prescribing to address the possible cause of their irrational prescribing: a lack of information about how to prescribe. Safe medication practice should be emphasized by general practitioners, especially in rural areas of India.

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