

## RESEARCH ARTICLE

### Prescription audit at a tertiary care teaching hospital

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#### ABSTRACT

**Background:** Prescription audit analyzes prescriptions for their rationality. It is one of the prerequisites to ensure optimal health care. **Aims and Objective:** The present is undertaken to study the analysis of prescriptions in a tertiary care teaching hospital. **Materials and Methods:** An observational study was conducted from January 2012 to August 2015 at the Department of Pharmacology, Sri Devaraj Urs Medical College, Kolar. The prescriptions reaching the Pharmacy of RL Jalappa Hospital and Research Centre, Kolar, were analyzed for the total drugs prescribed, number of injectables, drugs prescribed by generic names, and categories of drugs. **Results:** A total of 9286 prescriptions were analyzed, of which 56.1% of them had incomplete patient details, 40.1% prescriptions contained 1–2 drugs, and 25.7% had five or more drugs. At least one antimicrobial was prescribed in 55.4% prescriptions, and 19.1% had at least one multivitamin preparation. A total of 31,923 drugs were prescribed, of which 42.3% of the drugs were injectables. The drugs which were prescribed using generic names constituted 11.3% of all the drugs. The major categories of drugs prescribed were antimicrobials (25%), drugs used in peptic ulcer (16.7%), and analgesics (12.6%). **Conclusion:** The audit of prescriptions revealed incompleteness, 25% had more than five drugs, antimicrobials were common, and the use of generic names was less.


**KEY WORDS:** Prescription Audit; Polypharmacy; Antimicrobials

#### INTRODUCTION

Rational use of drugs is essential to achieve good quality health care for patients as well as for community.<sup>[1]</sup> Rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, with the lowest cost to them and their community.<sup>[1]</sup> Irrational prescribing leads to ineffective and unsafe treatment, which may subject the patient to exacerbation or prolongation

of illness, unnecessary distress, harm, and also higher expenses.<sup>[2]</sup>

An ideal prescription should include the patient's full name, age, address, with or without the patient's hospital number, date of the prescription, and the clinical diagnosis and clearly specify the name of the drug using the generic name, the formulation used with the dose, frequency of administration, total quantity to be supplied or the duration of treatment, and signing the prescription, indicating one's name, and if possible, one's address.<sup>[3]</sup> The assessment of prescribing patterns by auditing prescriptions serves as a tool to monitor, evaluate, and suggest appropriate modifications in prescribing practices of medical practitioners to rationalize medical care and make it more cost-effective.<sup>[4]</sup> In addition, as a large amount of resources are spent on drugs, it becomes even more essential to regularly monitor drug prescriptions and drug administration and formulate appropriate measures to rectify the errors detected so as to ensure effective utilization of the resources spent.<sup>[4]</sup>

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Our institution is a tertiary care hospital which meets the health needs of majority of the population in and around Kolar. As regular prescription auditing has not been undertaken at this institution earlier, this study serves as a tool to evaluate the prescribing practices of the doctors in an attempt to optimize and rationalize the health care.

## MATERIALS AND METHODS

An observational study was conducted from January 2012 to August 2015 at the Department of Pharmacology, Sri Devaraj Urs Medical College, Tamaka, Kolar. Permission for carrying out prescription audit was obtained from the Medical Superintendent, RL Jalappa Hospital and Research Centre (RLJH and RC), Kolar, attached to Sri Devaraj Urs Medical College, Kolar, and the approval was obtained from Institutional Ethics Committee. The prescriptions reaching the Pharmacy, RLJH, and RC were analyzed for (a) prescriptions with complete and incomplete patient details, (b) prescriptions with 1–2, 3–4, and  $\geq 5$  drugs, and (c) prescriptions with at least one antimicrobial agent and those containing at least one multivitamin preparation. Prescriptions were defined to be complete if patient details such as name, age, gender, hospital number, and the department were clearly mentioned. Various drugs prescribed were also analyzed for (a) commonly prescribed drug classes as well as drug categories, (b) injectable and non-injectable drugs, and (c) drugs prescribed by generic and brand names, respectively. All data were expressed as a percentage and mean and analyzed by descriptive statistics.

## RESULTS

A total of 9286 prescriptions were analyzed. The prescriptions when assessed for completeness regarding the patient details; it was found that 56% of the prescriptions were incomplete. Figure 1 depicts the percentage of prescriptions containing 1–2, 3–4, and  $\geq 5$  drugs, respectively. Majority (55.4%) of the prescriptions had at least one antimicrobial drug prescribed. Multivitamin preparations were prescribed in 19.1% prescriptions. A total of 31923 drugs were prescribed, and Figure 2 shows the percentage of drugs which were prescribed as injectables. In Figure 3, the percentage of drugs which were prescribed by generic and brand names, respectively, has been depicted. Most of the drugs were prescribed by their brand names.

## DISCUSSION

Table 1 shows the percentage of the various drug categories prescribed. Antimicrobial agents (25%) were the most common followed by drugs used in gastrointestinal (GI) disorders (16.7%) and analgesics (12.6%).

Figure 4 represents the percentage of various drug classes prescribed. Apart from antimicrobials (25%),

nonsteroidal anti-inflammatory drugs (NSAIDs) (11.3%) and multivitamin preparations (7.4%) were commonly prescribed followed by proton pump inhibitors (5.8%) and H<sub>2</sub> blockers (5.2%).

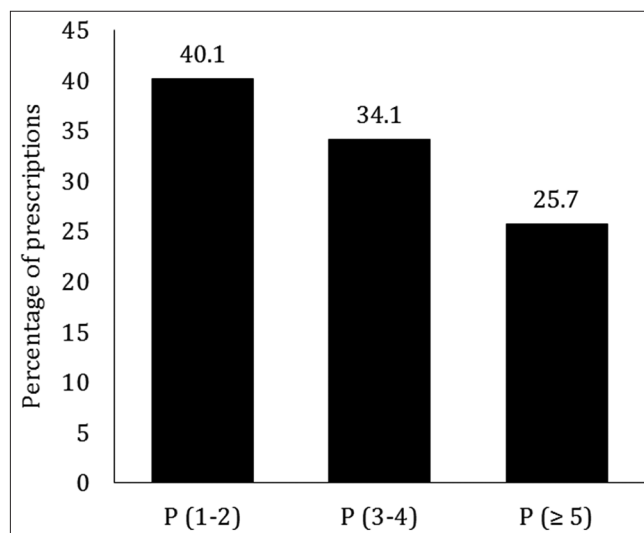


Figure 1: Drugs per prescription

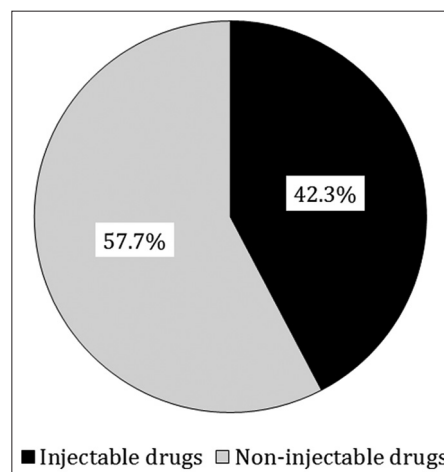


Figure 2: Injectable and non-injectable drugs

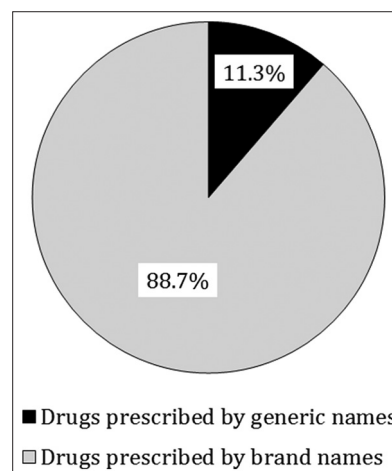


Figure 3: Drugs prescribed by generic and brand names

In this study, majority of the prescriptions were found to be incomplete and revealed polypharmacy. Antimicrobial use was found in most of the prescriptions, were the most common drug category prescribed, the use of injectable formulations was frequent, and generic drug prescribing was minimal.

Prescription writing is one of the most important and basic skills; a doctor should be able to perform. Specific training and supervision in prescription writing should be emphasized during undergraduate and postgraduate teaching to minimize errors.<sup>[5]</sup> Prescription deficiencies could be due to the attitude of some doctors, who due to inadequate time are unwilling to spend a little more time in writing clear and legible prescriptions. However, the extra time spent on the prescriptions can avoid unnecessary enquiries from the pharmacist and also discrepancies in the patient receiving the intended treatment.<sup>[3]</sup> The recent MCI guidelines for drug

prescribing demands for drug as well as drug details are to be written in capital letters along with the pharmacy (where the drug is dispensed) details.<sup>[6]</sup>

In this study, it was found that majority of the prescriptions (56%) were incomplete regarding patient details. This may sometimes lead to improper dispensing of the medications as complete patient details, especially age, gender, weight, and diagnosis, may help the pharmacist to clarify his doubts if any regarding the medications. The first group of parameters that must be in a prescription note is the patient's identification details.

Complete patient identification details prevent incorrect prescription and administration. There is ample international evidence that poor-quality prescription writing increases the risk of serious medication errors.<sup>[7]</sup> The age of the patient could guide the pharmacist to ensure dispensing appropriate dose of the drug.<sup>[7]</sup>

In this study, polypharmacy was quite prevalent which increases the chances of adverse drug reactions, drug interactions as well as high expenses for the patient.<sup>[8]</sup> It also leads to increased incidence of prescribing errors (those related to drug interactions).<sup>[4]</sup> The average number of drugs per prescription amounted to 3.4, and about 60% of the prescriptions had  $\geq 3$  drugs prescribed. In contrast to this study and Afroz *et al.* study (where the mean number of drugs per prescription was 4.22), Anteneh study (1.9), Ndungu *et al.* study ( $2.20 \pm 1.16$ ), and Sudarshan study (2.14) reported the lower mean number of drugs per prescription.<sup>[2,8-10]</sup>

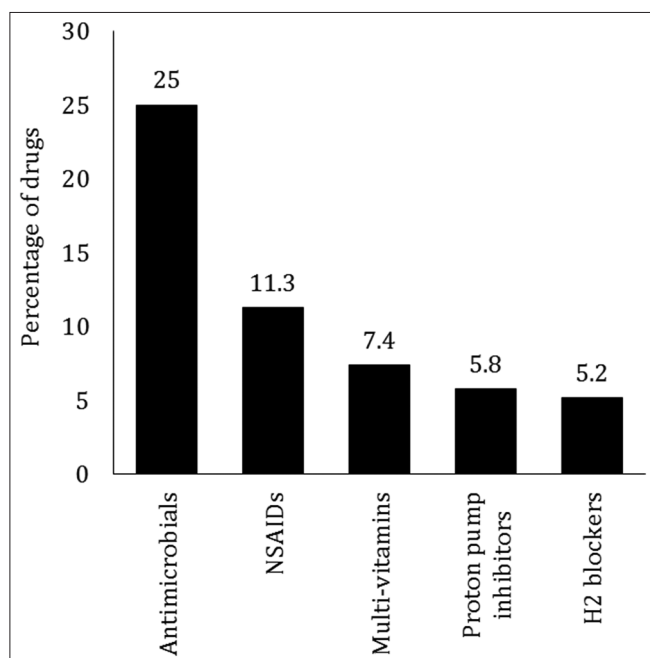
In our study, 55.4% of the prescriptions had antimicrobials prescribed. In Anteneh study and Ola *et al.* study, 58.1% and  $39.2 \pm 8.8\%$ , respectively, of the prescriptions contained an antibiotic which was found to be 39.4% in Sudarshan study<sup>[1,2,10]</sup> Use of antimicrobials should be rational as irrational use may lead to emergence of antimicrobial drug resistance, as well as increased adverse reactions and unnecessary hospital admissions.<sup>[1]</sup> Superinfection is also a potential possibility with overprescribing of antimicrobials. Among the various drug categories prescribed in this study, antimicrobials were the most frequent category prescribed (25%). Ndungu *et al.* study showed anti-infective drugs prescribing prevalence as 28.6% while Shiv *et al.* study and Anteneh study showed prescribing prevalence for antibiotics of 37% and 58%, respectively.<sup>[2,8,11]</sup>

Drugs used in GI disorders (16.7%) and specific drugs used in peptic ulcer were the next frequently prescribed drug category at our hospital. Peptic ulcer and gastritis are common ailments nowadays and the prescribing prevalence for antimicrobials (along with which proton pump inhibitors or H<sub>2</sub> blockers are coprescribed to prevent drug-induced gastritis) was high in this study. Ndungu *et al.* study showed the prescribing prevalence for GI drugs to be 7.1%.<sup>[8]</sup> In the present study, among the various drug classes prescribed, apart from antimicrobials, NSAIDs were frequent, constituting 11.3%

**Table 1: Categories of drugs prescribed**

Therapeutic class	Percentage
Antimicrobials	25
Drugs used in GI disorders	16.7
Analgesics	12.6
Drugs used in respiratory disorders	8.2
Nutritional agents	7.4
Drugs used in CVS disorders	6
Drugs used in CNS disorders	3.6
Drugs used in endocrine disorders	3.7
Others	16.8

GI: Gastrointestinal, CNS: Central nervous system, CVS: Cardiovascular



**Figure 4: Drug classes prescribed**

of the total drugs. NSAID use was found to be 15.85% in Mohammad *et al.* study, and it was the most common drug group prescribed in Afroz *et al.* study.<sup>[3,9]</sup>

At our institution, injectable drug formulations were commonly used amounting to 42.3% of the total formulations which was as low as 9.9% in Ola *et al.* study and 8.6% in Sudarshan study.<sup>[1,10]</sup> This was an expected finding as this hospital is a tertiary care teaching hospital as well as a referral center and injectable drug formulations have a faster onset of action.<sup>[2]</sup> Overuse of injections when oral medication can be more appropriate is irrational as the cost is higher than that of oral therapy. Moreover, bloodborne diseases such as hepatitis and HIV/AIDS can be transmitted by the use of non-sterile injections.<sup>[1]</sup>

The practice of prescribing drugs by generic names was found to be very minimal (11.3%) in the present study, which ideally should be 100%. This is in contrast to Anteneh study and Ola *et al.* study, which reported the percentage of generic name drug prescribing to be as high as 98.7% and 95.4%, respectively.<sup>[1,2]</sup> Sudarshan study also revealed the percentage of generic name drug prescribing to be 69.26%.<sup>[10]</sup> This may reflect the influence of representatives of pharmaceutical companies for undue favors. Generic prescribing reduces the chances of dispensing errors which may be due to misinterpretation of sound-alike trade names of drugs and also decreases the economic burden on the patients.<sup>[12]</sup> The WHO considers generic drug prescribing as a safety precaution for the patients as it gives clear identification and enables easy information exchange and allows better communication between health-care providers.<sup>[1]</sup>

In this study, analysis of a large number of prescriptions adds to the strength of the study. At the same time, lack of analysis of rationality of the drugs can be mentioned as a limitation.

## CONCLUSION

The audit of prescriptions revealed incompleteness. Polypharmacy was quite evident with 25% of the prescriptions having more than five drugs. Antimicrobials were commonly used. Drug prescribing by generic names was minimal which suggests that clinicians should be encouraged to prescribe using generic names of drugs.

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