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Original Research Article

# A Hospital-Based Assessment of Prescriptions for Completeness

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**Abstract**

**Aim:** The aim of the study was to analyse the prescriptions for completeness.

**Methods:** The present study was carried out by Anugrah Narayan Magadh Medical College, Gaya, Bihar, India. Duplicate carbonless copies of the prescriptions with at least one antibiotics were collected from the doctors at regular intervals. Total of 1713 prescriptions were collected and analysed.

**Results:** 3942 drugs were prescribed, out of which 1614 were antibiotics. Average number of drugs per prescription is 2.6 and average number of antibiotics per prescription is 1.1. In department of ENT more than one antibiotic was prescribed in 33.24% of prescriptions. Analysis of prescriptions in each department reveals that mentioning of gender and age of the patient along with date of prescribing was least in department of general medicine. Department of urology followed by department of general surgery have prescriptions with least outpatient number mentioned in them. Outpatient number and age of the patient were least mentioned variables among all the departments analysed. Inappropriate antibiotic dosage formulations were mostly seen in the departments of urology, general medicine and OBG.

**Conclusion:** Primary care services are at the heart of health care services in any country. Improving safety in primary care is essential when striving to ensure universal health coverage and the sustainability of health care. Medication errors have a negative impact on patients' health and therefore should be minimized. Understanding the magnitude and addressing issues of prescription errors is essential to improve patient safety in health care. Interventions to prevent prescription errors need to be implemented.

**Keywords:** Prescription errors, Antibiotics, Medication errors



## Introduction

Prescription pattern analysis plays an important role in monitoring the rational use of medicines. Irrational prescribing is the most common cause of inappropriate use of medicines over the globe. [1] Irrational prescribing cannot be controlled without a decisive evaluation of prescribing pattern of medicines and assessing the event rate. Prescription research is also a vital part of pharmacoepidemiology where it provides information regarding the extent and nature of drug exposure. [2]

According to the World Health Organization (WHO), evaluating the quality, extent, and trend of drug utilization; the pattern of use of drugs with generic names, fixed-dose combinations (FDCs), and those from the national list of essential medicines (NLEM), in compliance with standard national guidelines, the completeness of prescription in terms of dose, formulation, duration, frequency, etc., constitute the common elements of prescription research. [3]

The art of writing of a prescription plays an important role in the health-care system of the country. Prescription research is needed to find gaps in prescription writing. There is a need to find out common mistakes committed while prescribing medicines. These errors may be due to the omission of certain aspects of the prescription. This can include omissions such as not writing in the correct format, or omitting the dosage form, dose, frequency, duration of medicine, special instructions and warnings, or not informing the patient about follow-up, or the investigations that are to be done before follow-up. In addition, there may be errors of commission like prescribing too many drugs, or unnecessary use of antibiotics, or unnecessarily prescribing injectable forms, or selecting costly drugs when cheaper alternatives are available. Errors of the commission also include selecting drugs when not indicated, prescribing medicines that can increase adverse drug reactions (ADRs), medicines that lead to adverse drug interactions,

irrational use of FDCs, etc., Most prescription audits emphasize on errors of omission rather than commission, as the information regarding detailed diagnosis and signs and symptoms are often not recorded. Hence, it becomes difficult to determine the rationality of prescribed medicines. [4,5]

Globally, as well as in a systematic review of literature from India, inappropriate prescriptions, leading to ineffectiveness, ADRs, increase in cost and antimicrobial resistance have been noted.[5] In the UK, 7%–10% of prescriptions of junior doctors have been found to be inappropriate. [6] The authors conducted a workshop on "Prescribing skills assessment and Training" as part of the South Asian Chapter of the American College of Clinical Pharmacology 2017 [7] which was attended by pharmacologists from major institutes in India. They discussed the challenges regarding irrational prescribing in India and opined that the training imparted during 2nd year of the medical curriculum was inadequate. Students at this stage cannot correlate with prescriptions because of limited clinical exposure. They are also unable to comprehend the potential impact of using brand names or the influence of medical representatives from pharmaceutical companies.

The aim of the study was to analyse the prescriptions for completeness.

**Materials and Methods**

The present study was carried out at OPD of general medicine, general surgery, obstetrics and gynaecology (OBG), orthopaedics, otorhinolary ngology (ENT) at Department of Pharmacology Anugrah Narayan Magadh Medical College, Gaya, Bihar, India. Duplicate carbonless copies of the prescriptions with at least one antibiotics were collected from the doctors at regular intervals. Total of 1614 prescriptions were collected and analysed.

Prescriptions were analysed based on the WHO (world health organization) core drug prescribing indicators (average number of drugs per prescription, average number of antibiotics per prescription and percentage of antibiotics prescribed by generic name).[8]

Prescriptions were analysed for the mentioning of patient's name, age, gender, outpatient number along with the signature of the prescribing physician and date of prescribing. They were also assessed for mentioning dosing schedule, dosage form, dose and route of administration of antibiotic prescribed. Prescriptions from OPD patients were also analysed for appropriateness of the strength and formulation of the antibiotics prescribed.

The data collected from the prescriptions was fed into Microsoft excel sheet to create a data base file. To analyse the antibiotics and adjuvants prescribed, each drug was assigned a code. The master chart was obtained and analysed using descriptive statistics. Results on categorical measurements are presented in number and percentage.

**Results**

**Table 1: Distribution of the number of antibiotics prescribed per prescription**

| No of antibiotics | ENT (n=626) | Medicine (n=450) | Urology (n=157) | Surgery (n=125) | OBG (n=155) | Orthopedics (n=101) | Total (n=1614) |
|---|---|---|---|---|---|---|---|
| **1** | 470 | 435 | 140 | 120 | 148 | 101 | 1414 |
| **2** | 150 | 15 | 17 | 5 | 7 | 0 | 194 |
| **3** | 6 | 0 | 0 | 0 | 0 | 0 | 6 |

3942 drugs were prescribed, out of which 1614 were antibiotics. Average number of drugs per prescription is 2.6 and average number of antibiotics per prescription is 1.1. In department of ENT more than one antibiotic was prescribed in 33.24% of prescriptions.

**Table 2: Distribution of prescriptions with parts of prescription mentioned**

| Parts of the prescription | ENT (n=626) | Medicine (n=450) | Urology (n=157) | Surgery (n=125) | OBG (n=155) | Orthopedics (n=101) | Total (n=1614) | Total (%) |
|---|---|---|---|---|---|---|---|---|
| **Name** | 608 | 445 | 152 | 122 | 150 | 101 | 1578 | 96.16 |
| **Age** | 598 | 326 | 135 | 112 | 145 | 91 | 1407 | 87.17 |
| **Gender** | 601 | 385 | 145 | 121 | 145 | 99 | 1496 | 92.69 |
| **Outpatient number** | 580 | 342 | 104 | 92 | 110 | 93 | 1240 | 81.84 |
| **Signature** | 608 | 441 | 148 | 120 | 140 | 99 | 1488 | 96.40 |
| **Date** | 578 | 412 | 140 | 115 | 134 | 91 | 1470 | 91.07 |

Analysis of prescriptions in each department reveals that mentioning of gender and age of the patient along with date of prescribing was least in department of general medicine. Department of urology followed by department

of general surgery have prescriptions with least outpatient number mentioned in them. Outpatient number and age of the patient were least mentioned variables among all the departments analysed.

**Table 3: Details of appropriate dosage formulation and strength of the antibiotics prescribed**

| Departments | ENT (%) | Medicine (%) | Urology (%) | Surgery (%) | OBG (%) | Orthopedics (%) | Total (1614) | Total(%) |
|---|---|---|---|---|---|---|---|---|
| **Appropriate formulation** | 98.7 | 88.6 | 86.3 | 92.4 | 90.5 | 94.3 | 1515 | 93.86 |
| **Appropriate strength** | 98.7 | 97.9 | 99.2 | 98 | 100 | 97.3 | 1590 | 98.51 |

Inappropriate antibiotic dosage formulations were mostly seen in the departments of urology, general medicine and OBG.

## Discussion

The United States National coordinating council for medication error reporting and prevention defines a medication error as any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use. [9]

Medication errors are one of the most common patient safety issues and prescribing errors are one of the most common types of medication errors. [10] Prescribing error is defined as a clinically meaningful prescribing error when, as a result of a prescribing decision or prescription writing process, there is an unintentional significant reduction in the probability of treatment being timely and effective or increase in the risk of harm when compared with generally accepted practice. [11] 3942 drugs were prescribed, out of which 1614 were antibiotics. Average number of drugs per prescription is 2.6 and average number of antibiotics per prescription is 1.1. In department of ENT more than one antibiotic was prescribed in 33.24% of prescriptions. Analysis of prescriptions in each department reveals that mentioning of gender and age of the patient along with date of prescribing was least in department of general medicine. Department of urology followed by department of general surgery have prescriptions with least outpatient number mentioned in them. Outpatient number and age of the patient were least mentioned variables among all the departments analysed. Inappropriate antibiotic dosage formulations were mostly seen in the departments of urology, general medicine and OBG.

Use of brand names in the current study was very high similar to the study by Shanmugapriya et al. [12] Extensive use of brand names by the prescribing physician, can contribute to prescription errors. In our tertiary care setting where a single pharmacy dispenses drug of various specialties, errors can be common. Alflox (norfloxacin) and alfox (oxcarbazepine) are sound alike drugs, which when wrongly dispensed causes a major effect on the therapeutic success. Contributing to this confusion are illegible handwriting, incomplete knowledge of drug names, similar packaging or labelling, similar clinical use, similar strengths, dosage forms, frequency of administration and the failure of manufacturers and regulatory authorities to recognize the potential for error for drug names, prior to approving new product names. [13]

The common factors that may influence medication errors were mistakes due to inadequate knowledge of the drug or the patient, memory lapses, lack of training or experience, fatigue, stress, high workload, insufficient resources, lack of standardized protocols and inadequate communication between healthcare professionals. As prescribing errors make up a significant proportion of all errors in healthcare, further involvement and work in this field has the potential to significantly improve patient safety. [14]

Prescribing errors are relatively common but preventable events. There are various methods to reduce prescription errors. One to one education, educational outreach visit, audit and feedback were the most effective methods to improve prescribing practices. [15] Academic detailing, group discussion, interventional strategies and support tools also aid in reducing errors, especially among the junior staff. Structured assessment like objective structured clinical examination (OSCE) can be used to improve awareness about medication errors among the medical students. Monitoring and reporting itself aids in reducing errors. [16] Other health care professionals like nurses, pharmacist can be included for multifaceted hospital interventions, thus aiming at reducing the errors.

## Conclusion

Primary care services are at the heart of health care services in any country. Improving safety in primary care is essential when striving to ensure universal health coverage and the sustainability of health care. Medication errors have a negative impact on patients' health and therefore should be minimized. Understanding the magnitude and addressing issues

of prescription errors is essential to improve patient safety in health care. Interventions to prevent prescription errors need to be implemented. Setting up local priorities, measuring and monitoring, use of electronic tools and strengthening workforce capacity and capability are few evidence based interventions, which can help to reduce prescription errors.

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