

ANALYSIS OF COMPLETENESS AND LEGIBILITY OF PRESCRIPTION ORDERS  
AND PRESCRIPTION PATTERN AT A TERTIARY CARE HOSPITALSandeep Vihan<sup>1</sup>, Prashant Mishra\*<sup>2</sup> and Shashikant Bhargava<sup>3</sup><sup>1,2</sup>Associate Professor, Dept of Pharmacology, AFMC Pune.<sup>3</sup>Dept of Pharmacology, RML Hospital New Delhi.

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Article Received on 04/01/2022

Article Revised on 25/01/2022

Article Accepted on 10/02/2022

## ABSTRACT

**Introduction:** Prescription errors are currently a worldwide public health issue and are the commonest form of avoidable medication errors. The purpose of study was to screen drug prescriptions dispensed in the out-patient department of a tertiary care hospital for its pattern and completeness of information. **Materials and Methods:** A retrospective cross-sectional study was conducted including 400 prescriptions of out-patient department. All prescriptions were evaluated for presence of (a) Prescriber information (hospital details, department, name, designation and signature of physician) (b) Patient information: Name, age, sex, weight, address, and date of issue (c) Details of each medication prescribed: Strength, frequency, route, dosage form, quantity to be dispensed, and instructions for use. Subjective assessment of legibility of handwriting was done. **Results:** Hospital identification details were present on all prescriptions. Prescriber details like name, designation, and signature were present in 46.25%, 21.75%, and 73.25%, respectively. The patient's name, age, and gender were on 94.75%, 77.25% and 69.50%, respectively. Weight was mentioned on 10% and address on none. Details of medication like strength of medication and the frequency of administration were included in 70.33% and 93.77%, respectively. Route and dosage form were on 26.92 and 77.93%, respectively. 88.09% had quantity to be dispensed and 17.76% had instructions for use mentioned. **Conclusions:** The results demonstrate that prescription error occur frequently and may lead to medication error. There is a need to critically address the legibility and correctness of prescription through sensitization and emphasis during undergraduate and postgraduate teaching to minimize the occurrence of medication errors.

**KEYWORDS:** Prescription analysis, medication errors, prescription pattern, tertiary care.

## INTRODUCTION

Inappropriate prescription increases the cost of medical treatment and increases morbidity and mortality throughout the world and especially so in developing countries. Irrational prescription of drugs also leads to an increase in the incidence of adverse drug events and the emergence of drug resistance. Rational and correct prescription promotes rational use of medicine where the patients receive medicines appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time and at the lowest cost. Unfortunately, prescription errors account for 70% of medication errors that could potentially result in adverse effects.<sup>[1-2]</sup> A medication error has been defined 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 healthcare professional, patient, or consumer".<sup>[3]</sup> With the number of prescription growing every year, health professionals who write prescriptions need to be particularly cautious to avoid mishaps. Prescribing drugs is an essential skill, which is required to be continuously assessed and refined

accordingly. The rational prescribing skills of clinicians can be assessed by conducting periodic prescription audits. These audits and studies can also influence the policy makers by informing them about the quality of drug use in the health facility. Factors associated with prescribing errors include calculations of drug dose errors in decimal points, medications with similar names, medication dosage forms (controlled release vs. non-controlled release) and use of abbreviations.<sup>[2]</sup> Inadvertent drug substitutions occurred in several instances in our practices due to the combination of the physician's illegible handwriting on prescriptions and the pharmacist's misinterpretation of subtle clues, which might have prevented the errors.<sup>[4]</sup> Since errors of prescribing are the commonest form of avoidable medication errors, it is the most important target for improvement.<sup>[5]</sup> Adherence by the physician to good quality prescribing will minimize errors and ultimately improve patient care. Hence, we conducted this study to screen drug prescriptions dispensed at pharmacy in a tertiary care hospital for the essential elements of prescriptions and to analyze the trends in writing a

prescription and thereby to determine whether there is a need for an educational intervention.

## MATERIALS AND METHODS

This was a cross-sectional study conducted in a tertiary care hospital carried out between July 2021 and Sep 2021. We evaluated prescriptions of outpatients coming to hospital pharmacy for drug dispensing. Four hundred prescriptions written by physicians from various specialties were studied. The prescribing doctors were not aware of the study being done. Errors on the prescription were identified. All prescriptions at the time of the study were hand written. To analyze the patterns of prescriptions a checklist of essential parameters according to WHO guidelines for prescription writing was made. Parameters included: (a) Prescriber information: Hospitals name, address, information about the department and unit. Details about prescriber i.e., Name, Designation and Signature. (b) Patient information: Name, age, sex, weight, and address of the patient and date of issuing prescription. (c) Details of each medication prescribed: Generic/Brand name, strength, and frequency of administration, quantity to be dispensed, route, dosage form and instructions for use of the medication. Use of abbreviations if any was also noted. The prescriptions were carefully analyzed for the parameters listed above. We also analyzed legibility of physician's handwriting on the prescriptions on a subjective scale as: Grade 1: Illegible, Grade 2: Barely legible, Grade 3: Moderately legible, Grade 4: Clearly legible.

## RESULTS

Total 400 prescriptions were analyzed on which total of 960 drugs were prescribed with an average of 2.4 drugs per prescription (min 1 and max 8). Hospitals name and address was printed on all prescriptions. The department and the unit was mentioned in all the prescriptions, but the name and designation of prescribing doctor was found in 86.25% and 60.75%, respectively. Out of all 96.29% were signed by the physicians. Symbol Rx was missing in 13.63%.

### Patient information

The patient's name, age, and sex were present on 84.75%, 97.25%, and 89.50% respectively. No prescription mentioned the patient's complete address and weight was mentioned only in 10% of prescriptions. Date of writing prescriptions was mentioned in 95.75% cases.

### Details of medication prescribed

Generic drug names were used in 79.49%. Strength of medication and the frequency of administration were included in 80.37% and 93.77% of drugs prescribed. Route was mentioned for 56.92% while dosage form for 97.93% drugs prescribed. Most prescriptions i.e. 68.15% had quantity to be dispensed indicated. Instructions for patient use were mentioned in 47.83%. Diagnosis was included in about two-thirds.

### Legibility

The prescriber's handwriting was in Grade 1 in 5%, Grade 2: 20.5%, Grade 3: 43.5%, Grade 4: 31%.

### Drug Classes prescribed

Most common drugs prescribed in the prescription were NSAIDs (56%), antimicrobial agents (25.6%), proton pump inhibitors (17.2%) followed by anti-diabetic (11.25%), anti-hypertensive (7.2%) and statins (4.5%).

## DISCUSSION

The present study was undertaken to review the pattern and completeness of prescriptions of out-patient department at a tertiary care hospital. Data was collected from 400 prescriptions of patients coming at the hospital pharmacy.

Hospitals name and address were pre-printed on all the prescriptions while the name of the department and unit who had issued the prescription was present in the form of a stamp. But the prescriber identification information name and designation was missing in few of the prescriptions. Few of the prescriptions does not have signatures of the prescribing doctors. Also the symbol Rx (which means take though) was missing in 13.63% prescriptions. Absence of prescriber information would pose difficulty in identification of the prescriber if there is any doubt/misinterpretation regarding the prescription. This is especially important at an institutional level where various resident doctors and various units work under a single department, if there was a need to verify the origin of a prescription to clarify certain aspects. In certain cases, this would invalidate the prescription and can cause inconvenience to the patient involved (especially in case of psychotropic drugs). With regards to patient information, gender of the patient was missing in few cases. Some prescriptions didn't have the name of the patient and a very small number had their weight mentioned on it which might be required for dose calculations especially in pediatric patients. Patient's name and address are needed on the prescription order to ensure that the correct medication goes to the proper patient and also for identification and record keeping purposes. For medications whose dosage involves a calculation, a patient's pertinent factors, such as weight, age, or body surface area, also should be listed on the prescription. Date of the prescription is an important part of the patient's medical record, and it can assist the pharmacist in recognizing potential problems. Compliance behavior also can be estimated using the dates when a prescription is filled and refilled. These findings were similar to a study done by R Kumari *et al.*, where prescriptions lacked details about the prescriber and the patient details were lacking in considerable prescriptions. The details of examination findings, weight of the child, follow-up visit, and signature of the prescriber were absent in the prescriptions at the primary health centers.<sup>[6]</sup> Many other similar studies also showed incompleteness of various prescribing indicators in a prescription.<sup>[7-10]</sup> On analyzing the required information

for each drug prescribed we found that brand name use was not very common. Omission of writing the dose is not a problem if the drug prescribed is available in single strength/dosage. However, many drugs are increasingly available in various strengths, dosage forms and hence this type of error may pose problems. Not writing the dose of medications and the omission of frequency of administration from prescriptions can contribute to inappropriate medication use e.g. adverse effects, treatment failure, and drug resistance. Panagiotis *et al.*, through his study have suggested that wrong dose, dose omission, and wrong time are most common error types in practice.<sup>[11]</sup>

The oral route of administration was not generally specified in the prescription and this was acceptable in certain cases. But still there are chances that the route might be misunderstood by the patients. Also in some instances mention about the route might help to identify the dosage form if required. Generally, a wrongly written dosage form does not lead to serious consequences unless the strength or the frequency of use of that dosage form is also different. Mention of instructions is important when an optimal dosage timing is required (e.g. proton pump inhibitors to be taken before food, few statins at bed time), it would likely benefit to patients. Inadequate information on instructions for drug use may lead to decrease patient compliance. Beckman *et al.*, in his study showed that patients often tend to forget the instructions discussed during a consultation, and frequently rely on the instructions given on the label of the medicine.<sup>[12]</sup> It appeared that the doctors reserved this duty for the pharmacist. Prescriptions without indication of total quantity of drug to be dispensed, involved analgesics, antihistaminic, multivitamins as well as antacids. Although many of these drugs may be given on as required basis, the prescriber is still the best judge on the total quantity to be supplied based on the patient's medical requirement. Even for dermatological, eye, ear, mouth or nasal preparations, an indication of the amount to be supplied is still necessary. Buchanan *et al.*, found that information and advice represent the most important factors influencing the use of topical medication by these patients.<sup>[13]</sup> The amount of a drug to be dispensed should be clearly stated and should be only that needed by the patient. Excessive amounts should never be dispensed, because this not only is expensive for the patient but may lead to accumulation of medicines, which can lead to harm to the patient or members of the patient's family if used inappropriately. It is far better to have several refills of a prescription than to have more than necessary prescribed at one time. Legibility assessment is quite subjective and thus may be biased in the study. Whether a prescription is legible or not depends on the assessor's familiarity with the handwriting of the prescriber as well as information provided in the prescription. However, it should be emphasized that prescriptions should be easily read by anyone involved in the dispensing activities since the prescriptions could be filled by any pharmacy outside the hospital. This is especially important for

look-alike and sound alike kind of drugs. This type of error may be reduced if the indication of the drug prescribed or the medical problem of the patient is also written in the prescription. Therefore, all prescriptions should be clearly and adequately written and if possible printed to prevent such medication errors. It is reported that computerized physician order entry and computerized physician decision support, in fact, significantly reduce prescription errors improving drug safety.<sup>[14,15]</sup>

The study clearly showed that there are deficiencies in the quality of prescription writing. The illegible handwriting can lead to confusion to the pharmacist and dispensing of wrong drug/wrong dose to the patient. The role that pharmacists play in the detection and correction of error needs to have greater recognition and to be formalized into a routine monitoring and feedback system. However, pharmacists are unable to prevent all errors due to time delays between prescribing and their seeing the drug chart, and because of limitations in the experience, knowledge, and workload of individual pharmacists. There is a need to critically address the legibility of prescription with all the essential elements mentioned in order to reduce the prescription-related medication errors. Training activities can be implemented, to improve the prescription behaviour of practitioners. Interventions such as regular short problem-based training courses/ workshop in pharmacotherapy can be made mandatory for practitioners. Regulatory guidance to develop prescription standards might be considered. Implementation of electronic computerized system of prescribing can be considered. Implementation of a prescribing error reporting system with ongoing reminders might help in reducing the errors.<sup>[16-18]</sup>

### Limitations of the Study

1. No categorization of prescribers was taken into consideration (Junior / Senior residents, Assistant Professors, Associate Professors, Professors). 2. It represented a limited population of patients, being a single center study. 3. Limited time period of the study (2 month)

### CONCLUSIONS

The results of this study demonstrate that prescription error frequently occurs in the clinical workplace and that there is scope for improving the prescribing habits. Rational prescription of drugs should be made a part of medical education at the undergraduate and post graduate levels with emphasis on integrated problem based pharmacotherapeutic teaching. It is also important to form Drug and Therapeutic Committees in a tertiary care hospital to formulate and standardize drug policy, conduct regular audits and provide feedback to prescriber to enable them to minimize the occurrence of medication error.

**ACKNOWLEDGMENT**

We would like to thank the hospital OPD staff and dispensary for their cooperation during this project.

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