

## Original Research Article

# A study of prescription auditing in inpatient general medicine in tertiary care government hospital

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## ABSTRACT

**Background:** Irrational prescribing is a global problem. Prescription auditing can help to find the medication errors caused by the Inappropriate prescribing. It is the systematic tool for analysing the quality of medical care, including the procedures used for diagnosis and treatment.

**Methods:** An observational, non-interventional study carried in general medicine department. A list of 10 questions were prepared to assess the appropriateness of prescribing patterns.

**Results:** A total of 110 prescriptions were collected and audited. Out of 110 prescriptions 6 (5%) prescriptions have therapeutic duplications and 21 (19%) classes of drugs in the prescription have interactions with each other. Found 8 (7%) drug food interactions. Found 100% appropriateness of drug ordered based on patient diagnosis, dosage of drug, frequency of drug, route of administration, drug intended to have a drug order in the medication chart, medication orders are clear, legible, dated, timed, names and signed, medication chart do not have any unapproved abbreviations

**Conclusion:** This study shows most of the prescribers need to check for drug duplication, drug-drug interactions and drug-food interactions before prescribing the medicines.

**Keywords:** Prescription audit, Inappropriate prescribing, Drug interactions, Therapeutic duplication

## INTRODUCTION

Prescription audit is the systematic, critical analysis provide quality of medical care, including the procedures used for diagnosis and treatment, the use of resources, and the resulting outcome and quality of life for the patients and it is a continuous cycle, involves observational practice, comparing practice with standards, setting standards, implementing changes and observing new practice.<sup>1</sup>

By prescription audit can assess the quality of medical care, because it is based on documented evidence to support diagnosis and treatment. It has an objective evidence and it is a systemic way of evaluating quality of

treatment and care provided by the physicians. Prescription audit is designed for a particular purpose that is the objective documentation by and to the doctors for conforming to their own standards.

Irrational prescribing is a global problem. The prescribing pattern should be rational and it is most important because, bad prescribing habits including misuse, overuse and underuse of medicines can lead to unsafe treatment, prolong hospitalization, health hazards, economic burden on the patients and wastage of valuable resources. All these can impact the quality of life of patient.<sup>2</sup>

A set of 'core prescribing indicators' formulated by the world health organization (WHO) for improvement in

rational drug use in outpatient practice. It includes indicators for prescribing, indicators for patient care and the facility indicators. Based on these indicators, studies have been carried out almost all over the world.<sup>3</sup>

The study of prescribing patterns seeks medical practitioners to monitor, evaluate and suggest modifications in prescribing practices. It helps to prescribe rational and cost-effective medications to the patients. Auditing prescriptions also forms part of drug utilization studies, by using prescribing indicators like average consulting, dispensing time, quantity of drugs actually dispensed, percentage of drugs adequately labelled, patients' knowledge about correct dosage and knowledge of essential drugs list or formulary, availability of key drugs.<sup>4</sup>

Objectives of the study were to assess the appropriateness of drug ordered based on patient diagnosis and assess the appropriateness of dosage of drug with the patient diagnosis, age, bodyweight, assess the appropriateness of frequency of drug ordered with patient diagnosis and age, assess the appropriateness of route of administration of drug ordered with patient age and signs and symptoms, assess the therapeutic duplication of drug ordered, assess the possible drug interactions found in the ordered, assess the possible food interactions found in the ordered, assess the appropriateness of drug intended to have a drug order in the medication chart, assess the appropriateness of medication orders are clear, legible, dated, timed, names and signed and assess the appropriateness of medication chart do not have any unapproved abbreviations.

## METHODS

This is a prospective observational, non-interventional study carried out at government general hospital (RIMS) at Kadapa in Andhra Pradesh from August 2019 to October 2019 (2 months). Total 110 prescriptions were collected. All patients in the department of general medicine are included in the study and patient who are with poisoning cases and with less than 2 drugs in the prescription were excluded. Patients prescriptions were taken and audited. Appropriateness and inappropriateness in the prescriptions were assessed.

As it is a non-interventional study and there is no direct interaction with patients and, only prescriptions were taken and assessed. So, ethical approval is not applicable for this study.

Statistical analysis done by Microsoft excel spread sheet was used to record the data of recruited subjects. In the excel spread sheet we calculated simple statistics like mean, percentage for patient demographics (age, gender) and drug interactions therapeutic duplications. Microsoft word and excel have been used to generate graphs, tables etc. Medscape drug interaction software was used for checking drug interactions.

## RESULTS

A total of 110 patients were taken into the study, 58 were males and 52 were females.

**Table 1: Percentage of appropriateness of drug ordered in the prescriptions.**

Sex	Appropriateness (%)	Inappropriateness (%)
Male	58 (100)	0
Female	52 (100)	0

**Table 2: Therapeutic duplication of drug ordered.**

Drugs	No. of duplications	Total (%)
Ambroxol	2	6 (5)
Paracetamol	4	

**Table 3: Possible drug interactions found in the ordered.**

Drug class	Drug	No. of interactions
Antiplatelets	Aspirin	7
	Clopidogrel	7
Calcium channel blockers	Amlodipine	10
	Nifedipine	1
Beta blockers	Metoprolol	9
Diuretics	Furosemide	8
Steroids	Dexamethasone	3
	Hydrocortisone	5
PPIs	Pantoprazole	5
Antiamoebics	Metronidazole	3
Nootropics	piracetam	2
ACEIs	Enalapril	2
Potassium sparing diuretics	Spironolactone	2
Biguanides	Metformin	2
ARBs	Telmisartan	2
Bronchodilators	Theophylline	2
Stomach protectants	Sucralfate	2
Fluoroquinolones	Ciprofloxacin	2
Antiemetics	Ondansetron	2
Hypolipidemics	Atorvastatin	1
Macrolides	Azithromycin	1
H2 receptor blockers	Ranitidine	1
Anti-fungal	Fluconazole	1
Antiepileptics	Phenytoin	1

The parameters which are present in the study are Appropriateness of drug ordered based on patient diagnosis, dosage of drug, frequency of drug, route of administration, drug intended to have a drug order in the medication chart, medication orders are clear, legible, dated, timed, names and signed, medication chart do not

have any unapproved abbreviations and all the parameters are 100 percent appropriate in the study, there is no inappropriate parameters are observed in the study (Table 1).

Total 6 therapeutic duplications are observed in the study, 3 were in male and 3 were in female. In 110 prescriptions 5% of prescriptions have repeated drugs (Table 2).

In this study found that a total of 21 (19%) drug classes are causing interactions. The majorly found classes that are causing drug interactions are cardiovascular drugs like anti-platelets are causing more interactions, followed by calcium channel blockers and beta blockers (Table 3).

Out of 110 prescriptions 8 (7%) prescriptions found drug-food interactions (Table 4).

**Table 4: Possible food interactions found in the ordered.**

Drug	Food interaction
<b>Pantoprazole</b>	Before food
<b>Ranitidine</b>	Before food
<b>Tetracycline's</b>	Milk products
<b>Digoxin</b>	Before food, same time, avoid potassium rich foods
<b>Atorvastatin</b>	Avoid grape juice
<b>Ciprofloxacin</b>	Dairy products + caffeine
<b>Metoprolol</b>	Right after meal
<b>ACEIs</b>	Potassium rich foods

## DISCUSSION

In this study found that 100% compliance to the Appropriateness of drug ordered based on patient diagnosis, dosage of drug, frequency of drug, route of administration, drug intended to have a drug order in the medication chart, medication orders are clear, legible, dated, timed, names and signed, medication chart do not have any unapproved abbreviations. The results are similar to the study done by Ahuja et al where the study found 100% compliance to standard protocol regarding parameters such as name of drug, dosage form, no use of unauthorised abbreviation, name, and sign by clinical assistant.

In this study found 6 therapeutic duplications in 110 prescriptions which was similar to the study done by Ahuja et al. Where the therapeutic duplications found was 1 in 62 prescriptions.<sup>5</sup> A similar study done by Roy et al where they found 20 therapeutic duplications out of 636 prescriptions.<sup>6</sup>

In this study we found 21 drug classes causes drug interactions in 110 prescriptions. Majorly cardiovascular drugs have a greater number of interactions than other. A study conducted by Kulkarni et al showed majority of drug interactions were found on cardiovascular drugs.<sup>7</sup>

In this study found amlodipine and metoprolol have high number of interactions which is similar to the study conducted by Kothari et al. Where they found that amlodipine, metoprolol and atenolol are the majorly found drug interactions.<sup>8</sup>

## CONCLUSION

This study concluded that prescribers have appropriateness in drug ordered based on patient diagnosis, dosage of drug, frequency of drug, route of administration, drug intended to have a drug order in the medication chart, medication orders are clear, legible, dated, timed, names and signed, medication chart do not have any unapproved abbreviations.

This study shows most of the prescribers need to check for drug duplication, drug-drug interactions and drug-food interactions before prescribing the medicines.

Found cardiovascular drugs have a greater number of interactions than other drugs but further studies are needed to be done on large group of population before concluding the interactions caused by cardiovascular drugs.

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