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A Comparative Evaluation and Analysis of Discharge Prescription Pattern of Cardiac Patients in the Cardiology Unit and the Internal Medicine Unit in a Tertiary Care Hospital

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Abstract

Discharge prescriptions are essential clinical documents that ensure continuity of patient care after hospital discharge. Cardiac patients commonly require multiple medications due to the presence of cardiovascular diseases and associated comorbidities, increasing the risk of polypharmacy and drug–drug interactions. The present study was conducted to comparatively evaluate and analyze discharge prescription patterns among cardiac patients admitted to the Cardiology Unit and the Internal Medicine Unit of a tertiary care hospital.

A prospective observational comparative study was conducted over a period of six months in a tertiary care teaching hospital. A total of 130 discharge prescriptions were analyzed, including 65 prescriptions each from the Cardiology Unit and the Internal Medicine Unit. WHO core prescribing indicators, prescription completeness, polypharmacy, drug–drug interactions, adherence to guideline-directed medical therapy (GDMT), renal dose adjustment, and prescribing quality indicators were evaluated using descriptive and inferential statistical analysis.

The average number of drugs prescribed per prescription was 6.8, indicating significant polypharmacy. Generic prescribing was comparatively low (30.8%), while antibiotic prescribing was limited to 13.8% of patients. Drug–drug interactions were identified in 40% of prescriptions. Prescription completeness, NLEM utilization, and adherence to GDMT were better in the Cardiology Unit compared to the Internal Medicine Unit. Chi-square analysis demonstrated statistically significant associations between several patient-related factors and prescribing patterns ($p < 0.05$).

The study concluded that significant variations exist between the Cardiology Unit and the Internal Medicine Unit regarding discharge prescribing practices. Regular prescription audits, rational prescribing practices, and clinical pharmacist involvement are necessary to improve patient safety and optimize therapeutic outcomes.

Keywords: Discharge Prescription, Cardiac Patients, Polypharmacy, Drug–Drug Interaction, WHO Prescribing Indicators, GDMT, Rational Drug Use

1. Introduction

A discharge prescription is a vital medical document provided to patients at the time of hospital discharge to ensure continuity of therapy and safe transition from inpatient to outpatient care. It contains detailed medication-related information such as drug name, dose, frequency, route of administration, and duration of therapy. Accurate discharge prescribing plays an important role in preventing medication errors, improving adherence, and reducing hospital readmissions.

Cardiovascular diseases (CVDs) are among the leading causes of morbidity and mortality worldwide. Patients suffering from cardiovascular disorders frequently require multiple medications including antiplatelets, anticoagulants, beta-blockers, statins, ACE inhibitors, diuretics, and antiarrhythmic drugs. The coexistence of comorbid conditions such as hypertension, diabetes mellitus, chronic kidney disease, chronic obstructive pulmonary disease, and heart failure further increases medication burden and the risk of polypharmacy.

Prescription pattern monitoring studies are important tools for evaluating rational drug use and adherence to standard treatment guidelines. Such studies help identify inappropriate prescribing, drug interactions, medication duplication, and deficiencies in prescription documentation. Comparative evaluation between departments can provide useful information regarding variations in prescribing practices and therapeutic approaches.

The Cardiology Unit primarily focuses on specialized evidence-based cardiovascular management and adherence to guideline-directed medical therapy (GDMT), whereas the Internal Medicine Unit manages a broader spectrum of diseases associated with cardiovascular complications. These differences may significantly influence prescription quality, medication burden, and patient outcomes.

Therefore, the present study was conducted to comparatively evaluate discharge prescription patterns among cardiac patients admitted to the Cardiology Unit and the Internal Medicine Unit in a tertiary care hospital.

2. Review of Literature

Martínez et al. reported that cardiovascular patients receiving anticoagulants are at increased risk of polypharmacy and drug–drug interactions due to the use of multiple concomitant medications.

Simran Agrawal et al. demonstrated that adherence to guideline-directed medical therapy significantly improves clinical outcomes and reduces hospital readmission among heart failure patients.

Fonarow et al. emphasized the importance of evidence-based cardiovascular pharmacotherapy in improving patient survival and therapeutic outcomes.

Several prescription auditing studies conducted in tertiary care hospitals have identified incomplete prescriptions, lack of physician authentication, and irrational prescribing practices as major concerns affecting patient safety.

Previous drug utilization studies have shown that WHO prescribing indicators are effective tools for evaluating rational drug use, prescription quality, and medication safety among hospitalized patients.

3. Aim and Objectives

Aim

To comparatively evaluate and analyze discharge prescription patterns of cardiac patients in the Cardiology Unit and the Internal Medicine Unit of a tertiary care hospital.

Objectives

1. To evaluate demographic characteristics of cardiac patients.
2. To assess WHO core prescribing indicators.
3. To determine the prevalence of polypharmacy.
4. To evaluate prescription completeness and documentation quality.
5. To analyze utilization of generic drugs and NLEM drugs.
6. To identify potential drug–drug interactions.
7. To assess adherence to GDMT in HFrEF patients.
8. To compare prescribing practices between Cardiology and Internal Medicine Units.

4. Materials and Methods

Study Design

A prospective observational comparative study was conducted.

Study Site

The study was carried out in the Cardiology Unit and Internal Medicine Unit of Sri Aurobindo Institute of Medical Sciences, Indore.

Study Duration

The study was conducted over a period of six months.

Study Population

A total of 130 discharge prescriptions were collected and analyzed from patients admitted to the Cardiology Unit and Internal Medicine Unit.

Inclusion Criteria

- Adult patients aged 18 years and above.
- Patients diagnosed with cardiovascular diseases.
- Patients admitted and discharged from Cardiology or Internal Medicine Units.
- Prescriptions containing complete therapeutic information.

Exclusion Criteria

- Pediatric patients.
- ICU discharge patients.
- Patients leaving against medical advice (LAMA).
- Incomplete or illegible prescriptions.

Data Collection Procedure

Data were collected using a structured Case Report Form. Information regarding demographic details, diagnosis, comorbidities, prescribed medications, prescription quality indicators, and therapeutic patterns were documented systematically.

Study Parameters

The following parameters were evaluated:

- WHO core prescribing indicators
- Average number of drugs per prescription

- Generic prescribing
- Antibiotic utilization
- NLEM usage
- Polypharmacy
- Prescription completeness
- Drug–drug interactions
- Renal dose adjustment
- GDMT adherence in HFrEF patients

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using appropriate statistical software. Descriptive statistics including mean, frequency, and percentage were used. Chi-square test and correlation analysis were applied for inferential analysis. A p-value less than 0.05 was considered statistically significant.

5. Results

Response Rate and Study Distribution

A total of 130 patients were included in the study. Equal distribution was maintained between the Cardiology Unit and Internal Medicine Unit, with 65 patients (50%) from each department.

Gender Distribution

Among the study population, 66 patients (50.77%) were male and 64 patients (49.23%) were female.

Age-wise Distribution

Most patients belonged to the elderly age group. Around 46.2% of patients were above 60 years of age, while only 13.8% were below 40 years.

Age Group	Number	Percentage
<40 years	18	13.8%
40–60 years	52	40%
>60 years	60	46.2%

Comorbidity Distribution

Most patients had multiple comorbidities. Approximately 47.7% had 1–3 comorbidities, while 34.6% had 4–5 comorbidities.

WHO Prescribing Indicators

The average number of drugs prescribed per prescription was 6.8, indicating significant polypharmacy.

Parameter	Value
Average drugs per prescription	6.8

Generic prescribing was relatively low, accounting for only 30.8% of prescribed drugs.

Antibiotics were prescribed in only 13.8% of patients, indicating comparatively rational antibiotic utilization.

NLEM Usage

Most prescriptions contained 4–6 drugs from the National List of Essential Medicines (NLEM), demonstrating good utilization of essential medicines.

Prescription Quality Documentation

Prescription quality indicators showed that:

- Physician signature present: 78.5%
- Allergy status documented: 73.1%
- Legible prescriptions: 85%
- Dose/route/frequency mentioned: 88%
- Follow-up instructions mentioned: 80%

HFrEF Guideline Therapy

Beta-blockers were the most commonly prescribed four-pillar therapy drugs (34.6%), followed by MRAs (29.2%), SGLT2 inhibitors (23.1%), and ACE inhibitors/ARNI (20.8%).

Drug–Drug Interactions

Potential drug–drug interactions were identified in 40% of prescriptions.

Common DDIs observed included:

- Aspirin + Clopidogrel
- Furosemide + Digoxin
- ACE inhibitors + Spironolactone
- Beta-blockers + Calcium channel blockers

Renal Dose Adjustment

Appropriate renal dose adjustment was observed in 84.6% of patients.

Comparative Analysis Between Units

Parameter	Cardiology Unit (%)	Internal Medicine Unit (%)
Prescription Completeness	94	77
High Comorbidity (>3)	57	65
HFrEF GDMT Adherence	65	30
NLEM Usage	70	55
DDI Identified	60	45

The Cardiology Unit demonstrated better guideline adherence, prescription completeness, and NLEM utilization compared to the Internal Medicine Unit.

Statistical Significance

Chi-square analysis demonstrated statistically significant associations between prescribing parameters and patient-related factors including:

- Gender
- Comorbidities
- Antibiotic prescribing
- Physician signature
- Allergy documentation
- HFrEF therapy
- Renal dose adjustment

The null hypothesis was rejected and the alternative hypothesis was accepted.

6. Discussion

The present study comparatively evaluated discharge prescribing patterns among cardiac patients admitted to the Cardiology Unit and Internal Medicine Unit in a tertiary care hospital.

The findings revealed a high prevalence of polypharmacy with an average of 6.8 drugs prescribed per prescription. Similar findings have been reported in previous cardiovascular drug utilization studies, where elderly patients with multiple comorbidities required complex multidrug therapy.

The majority of patients belonged to the geriatric age group and had multiple comorbid conditions, contributing to increased prescribing complexity and risk of drug interactions. Drug–drug interactions were identified in 40% of prescriptions, emphasizing the importance of medication review and clinical monitoring.

Generic prescribing was relatively low, indicating greater dependence on brand-name prescribing practices. However, utilization of NLEM drugs was satisfactory, reflecting partial adherence to rational prescribing principles.

The Cardiology Unit demonstrated comparatively better prescription completeness, physician authentication, GDMT adherence, and NLEM usage. This may be attributed to specialized cardiovascular management and stronger adherence to evidence-based clinical guidelines.

The Internal Medicine Unit managed patients with higher comorbidity burden and more complex clinical conditions, which may explain the comparatively lower prescription completeness and increased therapeutic variability.

The study findings highlight the importance of prescription auditing, medication reconciliation, and clinical pharmacist involvement in improving rational drug use and patient safety.

7. Conclusion

The present study concluded that significant differences exist between discharge prescribing patterns in the Cardiology Unit and the Internal Medicine Unit.

The Cardiology Unit demonstrated better prescription completeness, improved adherence to guideline-directed therapy, and higher utilization of essential medicines. In contrast, the Internal Medicine Unit showed greater prescribing complexity due to higher comorbidity burden.

Polypharmacy and drug–drug interactions were common among cardiac patients, emphasizing the need for rational prescribing and careful medication review. Although overall prescription quality was satisfactory, improvements are required in allergy documentation, physician authentication, and individualized dose adjustment.

Regular prescription audits, implementation of standard treatment guidelines, and active involvement of clinical pharmacists are necessary to optimize therapeutic outcomes and improve patient safety.

8. Limitations

1. The study was conducted in a single tertiary care hospital.
2. The sample size was limited to 130 patients.
3. Long-term follow-up of patients was not performed.
4. Economic burden and medication adherence after discharge were not evaluated.

9. Future Scope

1. Multicenter studies with larger populations can be conducted.

2. Long-term outcome assessment may be included.
3. Clinical pharmacist intervention studies can be performed.
4. Medication adherence and pharmacoeconomic analysis can be evaluated.

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