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A REVIEW ON DRUG–DRUG INTERACTIONS THROUGH PRESCRIPTION ANALYSIS IN ADULT PATIENTS

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ABSTARCT

Drug–drug interactions (DDIs) are an important clinical concern due to the increasing use of multiple medications in adult patients. DDIs may alter the pharmacokinetic or pharmacodynamic actions of drugs, resulting in reduced therapeutic efficacy or increased risk of adverse drug reactions. This review presents an overview of drug–drug interactions identified through prescription analysis in an adult female patient. Prescribed medications were systematically evaluated using drug interaction screening software to identify potential interactions and assess their severity. Patient demographic details and clinical conditions were considered during analysis. The findings revealed mostly mild interactions without serious adverse effects; however, their presence highlights the need for careful monitoring. The study emphasizes the importance of rational prescribing, routine interaction screening, and the role of clinical pharmacists in improving medication safety and therapeutic outcomes.

KEYWORDS: DDI, Rational Prescribing, Therapeutic Outcome.

1. INTRODUCTION

Modern medical practice frequently involves the use of multiple medications to manage chronic and acute diseases. While combination therapy is often necessary to achieve better therapeutic outcomes, it also increases the risk of drug–drug interactions. A drug–drug interaction occurs when the effect of one drug is altered by the presence of another drug administered simultaneously or within a short period.

DDIs can result in reduced drug efficacy, increased toxicity, or unexpected adverse effects. They are a significant cause of preventable adverse drug reactions and hospital admissions. Adult patients are particularly vulnerable due to chronic illnesses such as diabetes, hypertension, cardiovascular disorders, and infections, which require long-term drug therapy.

Prescription analysis is a systematic process of reviewing prescriptions to detect medication errors, inappropriate drug selection, dosing problems, and potential drug interactions. This review highlights the importance of prescription analysis in identifying DDIs and ensuring safe pharmacotherapy.

2. OBJECTIVES OF THE REVIEW

The main objectives of this review are

- To understand the concept and importance of drug–drug interactions
- To classify DDIs based on their mechanisms
- To evaluate DDIs through prescription analysis
- To assess the clinical significance of identified DDIs
- To highlight the role of pharmacists in preventing and managing DDIs

3. DRUG–DRUG INTERACTIONS

3.1 Definition

A drug–drug interaction is defined as a situation in which the pharmacological effect of one drug is modified by the administration of another drug. The interaction may enhance or reduce the therapeutic effect or increase the risk of adverse reactions.

3.2 Classification of Drug–Drug Interactions

Drug–drug interactions are broadly classified into pharmacokinetic, pharmacodynamic, and pharmaceutical interactions.

3.2.1 Pharmacokinetic Interactions

Pharmacokinetic interactions occur when one drug affects the absorption, distribution, metabolism, or excretion of another drug.

- **Absorption:** Some drugs may alter gastric pH, intestinal motility, or chelate with other drugs, thereby reducing absorption.
- **Distribution:** Competition for plasma protein binding may increase free drug concentration.

- **Metabolism:** Enzyme induction or inhibition, particularly involving cytochrome P450 enzymes, can significantly affect drug levels.
- **Excretion:** Drugs affecting renal blood flow or tubular secretion may alter drug elimination.

These interactions often require dose adjustment or close monitoring.

3.2.2 Pharmacodynamic Interactions

Pharmacodynamic interactions occur when two drugs act on the same receptor, organ, or physiological system.

- **Additive effects:** Combined effect equals the sum of individual effects
- **Synergistic effects:** Combined effect is greater than the sum
- **Antagonistic effects:** One drug reduces the effect of another

These interactions may be beneficial or harmful depending on the clinical situation.

3.2.3 Pharmaceutical Interactions

Pharmaceutical interactions occur due to physical or chemical incompatibility between drugs before administration, such as precipitation or degradation when drugs are mixed in the same syringe or intravenous fluid.

4. PRESCRIPTION ANALYSIS

Prescription analysis is a structured method used to evaluate prescriptions for accuracy, completeness, and safety. It includes checking:

- Patient details
- Drug name, dose, dosage form, and route
- Frequency and duration of therapy
- Potential drug–drug interactions

Through prescription analysis, potential DDIs can be identified early, allowing healthcare professionals to prevent adverse outcomes.

5. METHODOLOGY

This review is based on the analysis of prescriptions from adult patients. Prescribed drugs were evaluated using standard drug interaction screening software. Patient demographic details and clinical conditions were taken into consideration. Identified interactions were categorized based on severity as mild, moderate, or severe and classified according to their mechanism.

6. RESULTS AND DISCUSSION

The prescription analysis revealed the presence of multiple potential DDIs. Most interactions were found to be mild to moderate in severity and did not result in serious clinical complications. Pharmacodynamic interactions were more common than pharmacokinetic interactions.

Although no severe adverse outcomes were reported, the presence of DDIs indicates the possibility of harm if prescriptions are not regularly monitored. The findings suggest that routine prescription review can significantly reduce the risk of adverse drug reactions.

7. ROLE OF THE PHARMACIST

Pharmacists play a critical role in preventing and managing drug–drug interactions. Their responsibilities include:

- Reviewing prescriptions for potential DDIs
- Using interaction screening tools
- Communicating with prescribers to suggest safer alternatives
- Educating patients about proper drug use Monitoring for adverse drug reactions

The involvement of pharmacists improves therapeutic outcomes and enhances patient safety.

8. PREVENTION AND MANAGEMENT OF DDIs

Effective strategies to prevent DDIs include:

Rational prescribing and avoidance of unnecessary polypharmacy

- Use of electronic prescribing and interaction-checking software
- Regular monitoring of drug therapy
- Patient counseling and awareness
- Interprofessional collaboration among healthcare providers

9. CONCLUSION

Drug–drug interactions represent a significant challenge in clinical practice, especially among adult patients receiving multiple medications. Prescription analysis is an effective method for identifying and preventing potential DDIs. Although most interactions are mild, continuous monitoring is essential to ensure patient safety. The study emphasizes the importance of rational drug use and highlights the crucial role of pharmacists in improving medication safety and therapeutic effectiveness.

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