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Review Article

**HEIGHTENED DRUG- DRUG INTERACTIONS IN OLDER  
ADULTS: A CRITICAL CONCERN****J.S. Venkatesh<sup>1</sup>, Santhosh Uttangi<sup>2</sup>, Joshina Johnson<sup>3</sup>, JubyJohnson<sup>4</sup>, Jomin Varghese<sup>5</sup>,  
Kundan Singh<sup>6</sup>**<sup>1</sup>Professor and HOD, M.Pharm, Pharm.D, Department of PharmacyPractice, SCS College of  
Pharmacy, Harapanahalli, Karnataka, India<sup>2</sup>Assistant Professor, Pharm.D, Department of Pharmacy Practice, SCSCollege of Pharmacy,  
Harapanahalli, Karnataka, India<sup>3-6</sup>Pharm D Interns, SCS College Of Pharmacy, Harapanahalli,  
Karnataka, India**Abstract:**

*A drug-drug interaction typically involves an unintentional alteration in the effectiveness or side effects of a medication when taken concurrently with another drug. Potential drug interactions are concerning when two medications known to interact are prescribed to the same patient. The age of sixty-five is commonly associated with retirement and is often considered the starting point of old age in many developed countries. The ageing process is indeed a biological phenomenon, influenced by various factors beyond human control. Aging can impact the pharmacokinetics and pharmacodynamics of drugs, leading to changes in drug metabolism, distribution, and response. These alterations can contribute to variations in the duration of drug activity, effects, and an increased risk of drug toxicity and adverse reactions in older individuals. Optimizing drug treatment for the elderly involves considering factors like potential interactions, comorbidities, and individual responses to medications. A comprehensive approach with regular monitoring is crucial. Our review includes the pharmacokinetic effects of drugs in elderly, factors contributing to the drug interactions in elderly and its significance. Prescribing medication for the elderly requires careful consideration of various factors such as potential interactions, side effects, and individual health conditions. It's essential for practitioners to prioritize safety and effectiveness when prescribing for older adults to avoid adverse outcomes.*

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**INTRODUCTION:**

A drug-drug interaction typically involves an unintentional alteration in the effectiveness or side effects of a medication when taken concurrently with another drug. Potential drug interactions are concerning when two medications known to interact are prescribed to the same patient<sup>1</sup>. The age of sixty-five is commonly associated with retirement and is often considered the starting point of old age in many developed countries. The ageing process is indeed a biological phenomenon, influenced by various factors beyond human control<sup>2,3</sup>. Aging can impact the pharmacokinetics and pharmacodynamics of drugs, leading to changes in drug metabolism, distribution, and response. These alterations can contribute to variations in the duration of drug activity, effects, and an increased risk of drug toxicity and adverse reactions in older individuals<sup>4</sup>.

**PHARMACOKINETIC EFFECTS OF DRUGS IN ELDERLY**

Pharmacokinetic drug interactions involve changes in the absorption, distribution, metabolism, or elimination of a drug due to the influence of another drug. These interactions can alter how the body processes a drug, affecting its concentration and therapeutic effects. Pharmacokinetic interactions play a crucial role in altering the absorption, distribution, metabolism, and excretion of drugs, impacting their onset, duration, efficacy, and potential side effects. Monitoring and understanding these interactions are essential for optimizing therapeutic outcomes and minimizing adverse effects<sup>5</sup>.

Indeed, in the elderly, factors like reduced blood flow to the gut, changes in gastric pH, and alterations in gastrointestinal function can contribute to delayed drug absorption. These physiological changes may affect medication effectiveness and potentially lead to complications. It's crucial for healthcare providers to consider these factors when prescribing medications for older individuals. Changes in body composition, such as increased fat and decreased muscle mass, can affect the distribution of drugs in the elderly. Water-soluble drugs may have a reduced volume of distribution, while fat-soluble drugs may accumulate more, potentially impacting drug efficacy and safety in this population. In old age, hepatic parenchymal mass tends to decrease, which can

impact enzyme activity. Additionally, changes in blood flow to the liver may further contribute to alterations in enzyme function. The changes in drug metabolism can lead to various drug interactions, with cytochrome P450 (CYP450) isoenzymes frequently involved in microsomal mixed function oxidative systems and may have implications for overall health. As people age, there is often a natural decline in renal function. This can lead to a decrease in renal blood flow, glomerular filtration rate (GFR), and tubular secretion. As a result, the clearance of many drugs may be reduced in the elderly, impacting how medications are processed and eliminated from the body. It's essential for healthcare providers to consider these changes when prescribing medications for older individuals<sup>6</sup>.

**FACTORS CONTRIBUTING DRUG-DRUG INTERACTIONS IN GERIATRICS**

The increase in drug use among older adults is a concerning trend, potentially contributing to higher hospital admissions in this age group. Factors like multiple medications, age-related physiological changes, and underlying health conditions can amplify risks. Regular medication reviews and healthcare monitoring are crucial for elderly individuals to ensure proper management of their health<sup>2</sup>. Risks can be increased by variables such as taking several medications, physiological changes brought on by aging, and underlying medical disorders. Numerous disorders, the use of different medications, pharmacokinetics and pharmacodynamic interactions, the use of insufficient medications, and older patients' lack of compliance can all contribute to an increase in drug-drug interactions<sup>7,4</sup>.

Polypharmacy is common in individuals managing multiple chronic conditions, often leading to the simultaneous use of various long-term medications to address their health needs. Polypharmacy in older adults can lead to various challenges, including inappropriate prescribing, low adherence, adverse drug events, and increased potential for drug interactions<sup>8</sup>.

**SIGNIFICANCE OF DRUG INTERACTIONS IN ELDERLY**

The global health care and regulatory science

communities have given a lot of attention to the problem of DDIs recently. Every year, a huge number of new drugs are launched, and there are a growing number of reports of novel drug interactions. A list of possible drug interactions can be found in the prescribing material for the majority of medications. Many of the drug interactions that are listed may be uncommon, mild, or limited to a few circumstances, and therefore may not be significant. The most concerning medication interactions are those that significantly alter a drug's mode of action. The growing geriatric population in India presents a significant healthcare challenge, especially with the increase in comorbidities requiring multiple medications. Drug-drug interactions constitute a substantial subset of adverse drug events (ADEs), are widely distributed in patients undergoing multiple drug therapy, and are a major source of known drug-related occurrences<sup>5</sup>. Self-medication increases the danger of possible drug-drug interactions in addition to polypharmacy; any new medication must be compatible with the ones already being taken. Despite this, self-medication is still widely utilized by older persons<sup>9</sup>. The number of prescription pills written down increases when multiple doctors treat the same patient, and it can become difficult for the practitioners to remember to take all of the medications. This increases the possibility of drug interactions and can result in difficulties<sup>5</sup>.

#### CONCLUSION:

Optimizing drug treatment for the elderly involves considering factors like potential interactions, comorbidities, and individual responses to medications. A comprehensive approach with regular monitoring is crucial. Our review includes the pharmacokinetic effects of drugs in elderly, factors contributing to the drug interactions in elderly and its significance. Prescribing medication for the elderly requires careful consideration of various factors such as potential interactions, side effects, and individual health conditions. It's essential for practitioners to prioritize safety and effectiveness when prescribing for older adults to avoid adverse outcomes.

**CONFLICT OF INTEREST:** None

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