

Drug Related Problems in Older patients: Prevalence, Risk Factors, and Interventions

¹P. Gopi, Sk .Abu baker siddiq, P. Yugandhar Reddy, SK. Bushra Fathima, S. Charishma

¹Assistant professor, Pharm-D, Nimra college of pharmacy, Department of pharmacy practice.

Nimra college of pharmacy, Vijayawada, 521456 AP INDIA

E-mail: petetigopi@gmail.com

Abstract

Drug related problems (DPRs) are significant concern in geriatric care, contributing to increased morbidity, hospitalizations and healthcare costs. This review comprehensively examines the prevalence of the drug related problems among older patients, with focus on key risk factors such as polypharmacy and comorbidities. Recent studies indicate that the significant proportion of older patients experienced drug related problems, with issues like non-adherence and drug-drug interactions being prevalent. Furthermore, the review highlights the essential role of clinical pharmacist in identifying and managing drug related problems through effective medication reviews and interdisciplinary collaboration. By addressing these problems, clinical pharmacists can enhance medication safety, optimize therapeutic outcomes, and ultimately improve the quality of care for older adults. Future research should focus on developing targeted interventions and fostering greater collaboration among healthcare providers to mitigate the risks associated with drug related problems

Introduction

As the global population ages, medication use among older adults has increased significantly, leading to a greater risk of drug related problems. Drug related problems refers to any event or circumstance involving drug therapy that interferes with desired health outcomes. These problems can include adverse drug reactions, medication non adherence, inappropriate prescribing, drug interactions, and polypharmacy related complications. Older adults are particularly vulnerable due to age related physiological changes, multiple comorbidities, and the frequent use of multiple medications.

Aging is associated with an increased prevalence of chronic diseases such as hypertension, diabetes, cardiovascular disease and neurodegenerative disorder, necessitating the use of multiple medications. While pharmacotherapy plays a crucial role in disease management, it also increase the risk of drug related problems. Drug related problems refers to any undesirable event related to medication use that interferes with achieving the intended health outcomes. These problem may

include adverse drug reactions, inappropriate prescribing, medication errors and non-adherence. Older patients are particularly vulnerable to drug related problems due to physiological changes that affect drug metabolism and excretion. Declining renal and hepatic functions can alter drug clearance, leading to drug accumulation and increased toxicity. Furthermore, the presence of multiple chronic conditions often results in complex medication regimens, raising the likelihood of drug-drug interactions and inappropriate prescribing.

The prevalence of drug related problems in older patients is a significant public health concern. Studies indicate that a substantial proportion of hospitalizations and emergency department visits among the elderly are medication-related. Polypharmacy commonly defined as the concurrent use of five or more medications, is a major contributor to DRPs. Inappropriate prescribing, which involves the use of potentially harmful medications, is another significant issue in this population. Several tools, such as the beers criteria and stop\start guidelines, have been developed to aid clinicians in identifying and

mitigating inappropriate medication use in older adults.

Medication non-adherence is another critical factor contributing to DRPs. Cognitive impairment, financial constraints, complex dosing regimens, and inadequate health literacy are some of the major barriers to adherence. Non-adherence can lead to treatment failure, increased hospitalizations, and a reduced quality of life for older adults. Therefore, understanding the various risk factors for DRPs is essential in developing effective interventions to improve medication safety and patient outcomes.

Given the growing elderly population worldwide, addressing DRPs has become a priority in healthcare. A range of interventions, including medication reconciliation, deprescribing, clinical pharmacist-led reviews, and patient education, have been proposed to reduce DRPs and optimize medication management in older adults. Collaborative care involving healthcare professionals, patients, and caregivers is essential to ensure appropriate medication use and minimize drug-related harm.

Prevalence of Drug-Related Problems

Recent studies demonstrate a higher prevalence of drug related problems in older populations. For example, a study conducted at King Chulalongkorn Memorial Hospital in Bangkok found that 63.3% of participants experienced DRPs, with non-adherence (28.6%) and the need for additional therapy (26.4%) being the most common issues [1]. Similarly, another study focused on elderly patients in Northwest Ethiopia reported a significant number of drug-drug interactions, with 641 interactions detected among 389 subjects [2].

□ **Hospital Readmissions:** A systematic review found that approximately 9% of older adults discharged from hospitals experience drug related readmissions, with up to 22% of these cases being preventable.

□ **Hospital Admissions:** Research indicates that 14.1% to 95.9% of older adults experience DRPs leading to hospital admissions, with variations due to differing study methodologies and definitions.

□ **Geriatric Patients:** A study reported that 81.5% of admitted geriatric patients had at least

one drug related problem, averaging 1.9 drug related problems per patient.

Numerous studies have highlighted the high prevalence of DRPs in older adults:

A systemic review by Hamilton et al. (2020) found that 30-50% of older adults experience at least one DRP.

Research by Viktil et al. (2018) estimated that 70% of hospital admissions among older adults are medication-related.

Community-based studies indicate that 20-30% of older adults using multiple medications face at least one DRP (Gutiérrez-Valencia et al., 2021).

Risk factors of drug related problem`s

Several key factors contribute to the occurrence of drug related problem`s in older adults:

Polypharmacy: The use of five or more medications is strongly associated with DRPs. In the Bangkok study, the odds ratio for DRPs linked to polypharmacy was 2.50, indicating a heightened risk [1].

Comorbidities: Older adults with multiple health conditions are at an increased risk for DRPs. The same study reported an odds ratio of 2.20 for patients with three or more comorbidities [1].

Age: Advanced age correlates with a higher incidence of DRPs due to changes in pharmacokinetics and pharmacodynamics [4].

Cognitive Impairment: Declines in cognitive function can result in medication mismanagement, such as missed doses or incorrect administration.

Hospitalization: Factors such as prolonged hospital stays and retirement status were also linked to increased risk of drug-drug interactions in hospitals [2]

Inappropriate Medication Use: The Beers Criteria and STOPP/START guidelines identify high-risk medications (American Geriatrics Society, 2021). High prevalence of potentially inappropriate medications (PIMs) among older adults.

Medication Non-Adherence: Factors include cognitive decline, financial constraints, and complex dosing schedules. Studies indicate that 40-60% of older adults exhibit some level of non-adherence (Kripalani et al., 2019).

Interventions:

Medication Review: Regular assessment of a patient's medication regimen by health care professionals can identify and mitigate potential DRPs.

Patient Education: Educating patients about their medication's, including proper usage and potential side effects, can enhance adherence and reduce the risk of adverse event's.

Deprescribing: Systematically discontinuing medications that are no longer necessary or potentially harmful can reduce polypharmacy and its associated risks.

Interdisciplinary Approach: Collaboration among healthcare providers, including physicians, pharmacists, and nurses, ensures comprehensive care and monitoring of medication regimens.

Types of Drug-Related Problems

The most commonly identified DRPs include:

- **Non-adherence:** Patients often struggle to adhere to complex medication regimens, leading to missed doses and ineffective treatment [5].
- **Adverse Drug Reactions (ADRs):** Many older patients experience ADRs, with common issues including hyponatremia and headache as noted in studies assessing psychiatric patients [3].
- **Ineffective or inappropriate therapy:** Clinical pharmacists frequently identify cases where prescribed therapies do not meet patients' needs [4].

Role of Clinical Pharmacists in Managing Drug-Related Problems:

One of the main processes of pharmaceutical care has been defined as the detection, treatment, and prevention of drug-related issues. It has been discovered that doing medication reviews with elderly patients, which clinical pharmacists are well prepared to do, improves the usage of high risk drug's and increases the precision of prescription regimen's [6]. Thus, through medication review's and interdisciplinary teamwork, clinical pharmacists play a crucial role in the diagnosis and management of drug-related issues. Clinical pharmacists found that 66% of participants in research involving dementia

patients had drug-related difficulties, with inefficient or inappropriate medication therapy being the most prevalent [4]. Stopping the use of unsuitable drugs was a common intervention. Physicians' suggestions from pharmacists are very well-received, highlighting the importance of By conducting comprehensive medication reviews and engaging with healthcare teams, pharmacists can help prevent and resolve drug related problems, ultimately improving patient outcomes.

Interventions to Reduce Drug-Related Problems

- A variety of interventions have been proposed to minimize DRPs:

Medication Review and Deprescribing

- Regular medication review by healthcare professionals.
- Deprescribing protocols to discontinue unnecessary medications (Reeve et al., 2018).

Clinical Pharmacist Involvement

- Pharmacist-led interventions have shown significant reductions in DRPs.
- Medication therapy management (MTM) programs improve adherence and safety (Pellegrin et al., 2017).

Patient Education and Empowerment

- Encouraging shared decision-making and medication literacy.
- Use of medication adherence aids such as pill organizers and reminder apps.

Healthcare Provider Collaboration

- Multidisciplinary teams including physicians, pharmacists, and nurses.
- Implementations of electronic prescribing and clinical decision support systems.

Conclusion

The prevalence of drug-related problems among older adults is alarmingly high, driven by factors such as polypharmacy and comorbidities. Effective management strategies, particularly those involving clinical pharmacists, are crucial for mitigating these issues [3]. Future efforts should focus on enhancing interdisciplinary collaboration, conducting regular medication reviews, and developing targeted interventions to improve medication safety and efficacy in geriatric populations.

Prevention:

Before starting a new drug:

Before beginning a new medication, doctors should take the following steps to lower the likelihood of negative pharmacological effects in older adults: Examine alternatives to medication.

- Talk about the patient's and/or caregivers' goals of care and determine when the patient should anticipate to benefit from the medication therapy [6].
- Assess each new drug's indication (to prevent utilizing needless medications) [5].
- Take into account how pharmacokinetic or pharmacodynamic changes with aging may impact dosage needs [8].
- Select the safest medication for the condition (for example, acetaminophen rather than an oral non-steroidal anti-inflammatory drug [NSAID] for noninflammatory arthritis) [8].
- Look for possible interactions between drugs and diseases [7].
- Use the lowest dose that works first.
- Take as few medications as possible [5].
- Take note of concomitant conditions and how likely they are to exacerbate negative drug effects.
- Describe each drug's usefulness and side effects.

- Clearly explain to patients how to take their medications (including brand and generic names, how to spell each one, what each medication is used for, and how formulations containing multiple drugs work) and how long they will probably need them.
- Be prepared for confusion brought on by similar-sounding drug names and identify those that can be mistaken (e.g., Glucophage and Glucovance).

Following the initiation of drug use:

After beginning a medication, the following actions should be taken:

- To avoid a prescription cascade, assume a new symptom might be related to a medicine until proven otherwise [8].
- Measure drug levels and perform further laboratory tests as needed to keep an eye out for any indications of negative drug effects in patients.
- Record how well the therapy is working and raise dosages as needed to get the intended result [6].
- Periodically reassess whether drug therapy is still essential and discontinue any medications that are no longer required or that carry a higher risk than benefit [8].

Ongoing

Medication reconciliation: is a process that helps ensure that information about drug regimens is transferred at any point in the health care system. During each move (admission, transfer and discharge) the following should be done.

Computerized physician ordering programs: can notify clinicians of potential issues (e.g., allergy, need for decrease dosage in patients with impaired renal function, drug-drug interactions). They can also prompt clinicians to closely observe certain patients for adverse drug effects.

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