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REVIEW ARTICLE

POLYPHARMACY IN ELDERLY PATIENTS: A REVIEW**Dr. Meenakumari Amanacharla*, Dr. Raghunatha Rao Ponnaluri**

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ABSTRACT

Patients above 65yrs of age often present with multiple diseases requiring treatment with more number of drugs which is referred to as polypharmacy. Due to age related changes in the pharmacokinetic & pharmacodynamic parameters, elderly patients may present with adverse drug events, drug interactions and hospitalization resulting in increased morbidity. The aim of our study is to assess the various causes and effects of multiple medications and find measures to reduce and manage polypharmacy. Materials for this review were gathered from medline database. The causes for polypharmacy include multiple comorbidities, multiple hospital visits, consuming over the counter medications and herbal products. Risk of falls is found to increase with polypharmacy and treatment with cardiovascular and psychoactive drugs. With increase in the number of drugs the risk of adverse drug reactions and drug interactions is more. Increase in the medical expenditure and non adherence with the drugs has been associated with polypharmacy. Hence there is a need to evaluate polypharmacy by following various criteria or tools and manage treating the elderly in an effective manner

Key words: polypharmacy, multiple medications, elderly adults, geriatric**INTRODUCTION:**

With the increasing life span there are large numbers of patients above 65yrs of age. They present with multiple diseases like hypertension, Diabetes, Arthritis, Cancer cardiovascular diseases & neurological problems which warrant the consumption of more drugs compared to young adults.¹This may lead to increased risk of errors. As age advances the drugs remain in the body for long periods because of delayed absorption and get concentrated in discrete parts of the body due to reduced cardiac output and poor circulation, decreased metabolism by shrunken liver and decreased renal function leading to decreased excretion of drugs. All these features lead to increase in the incidence of adverse drug reactions. Moreover use of more number of drugs may result in increased number of drug-drug interactions. In addition to using multiple prescribed medications older people are also major users of complementary and alternative medicines and may not report this without prompting. They are at great risk of adverse effects and herb-drug interactions because of using complementary and alternative medicines

Objectives

Goals of our study by reviewing various articles in literature are

1. To assess the causes for polypharmacy
2. To know the effects of polypharmacy
3. To find out measures to reduce polypharmacy
4. Management of polypharmacy

METHODS

Materials for this review were gathered from medline database. The search terms included were polypharmacy, multiple medications, elderly adults, geriatric. The articles were studied to know the various causes & effects of polypharmacy as mentioned in their studies. The various measures to reduce and manage polypharmacy were also noted.

What is polypharmacy?

Polypharmacy defined as the use of 5 or more medications occurs in 20 to 40% of older people². As per the WHO, Polypharmacy refers to use of multiple medications by a patient³ or more drugs are prescribed than clinically warranted or even when all prescribed medications are clinically indicated but are too many to take (pill burden). This has the potential to cause ADRS due to drug-drug interactions. The use of multiple medications is often referred to as polypharmacy⁴. A second and perhaps more important definition is the administration of more medications than are clinically indicated⁵. It is often defined as the use of four or more regular medications⁶.

Causes for polypharmacy

Elderly patients have many co morbidities requiring several medications for different problems. Research has made available a number of newer medications for use. Some of the patients are used to take OTC medications and herbal preparations without a clear

knowledge of their efficacy and adverse reactions. When side effects occur for some drugs they are misinterpreted as symptoms of a disease and additional/additive drugs are prescribed by the practitioner. Patients often visit several physicians without revealing the previous prescriptions and continue to take the medications prescribed by all the physicians without the knowledge of drug-drug interactions and overdose⁷.

Effects of polypharmacy in older adults

Polypharmacy is associated with hospital admissions, functional and cognitive impairment, geriatric syndromes (Delirium, falls and Frailty) and mortality⁸. Polypharmacy is associated with an increased risk of falls in the elderly. Cardiovascular and psychoactive medications are well known to be associated with risk of falls. Every medication has potential adverse side effects and these seem to increase with the addition of new drugs.

Elderly are more prone to drug-drug interactions due to various pharmacokinetic and pharmacodynamic variations⁹. The number of drug-drug interactions rises sharply when 5 or more medicines are taken concurrently. The findings of Kristina Johnell are that the probability of potentially serious DDIs decreases with increasing age among the elderly women than elderly men¹⁰.

Risk of drug-disease interactions has been shown to increase with increased numbers of medications. With patients living longer with more chronic disease states requiring drug therapy, the risk of drug-disease interactions should be a concern for healthcare providers¹¹.

Polypharmacy and health care costs

Polypharmacy contributes to health care costs to both the patient and the healthcare system. A retrospective cohort study found that polypharmacy was associated with increased medical expenditure due to risk of taking a potentially inappropriate medication with an increased risk of outpatient visits, and hospitalization (30% increase in medical costs)¹². Another study conducted in Sweden reported that those taking 5 or more medications had a 6.2% increase in prescription drug expenditure and those taking 10 or more medications had a 7.3% increase¹³.

Polypharmacy and adverse drug reactions

The harm associated with polypharmacy includes increased risk of adverse drug reactions which increases with the number of prescribed drugs. In a population based study, outpatients taking 5 or more medications had an 88% increased risk of experiencing an ADE compared to those who were taking fewer medications¹⁴.

Polypharmacy & Hospitalization

Polypharmacy especially in elderly may lead to hospitalization due to various causes like adverse drug events, falls & functional decline. Unplanned hospitalization due to ADE's was almost 4 times in elderly taking more than 5 medications than those taking less¹⁵. Functional and cognitive impairment in older people are strong predictors of hospital admissions¹⁶. The prevalence of falls strongly increases with age being more common in women than men. The risk of falling increased significantly with the number of drugs used per day¹⁷. In a prospective cohort study, the use of 4 or more medications was associated with increased risk of falling and the risk of recurrent falls¹⁸. A meta analysis showed an increased risk

of falls in patients using diuretics, anti-arrhythmic drugs & psychotropics^{19,20}.

Adherence to the medications is a common problem in the elderly if the number of drugs prescribed are more in number. Non-adherence with drugs in older adults has been associated with complicated medication regimens and polypharmacy. Medication non-adherence is associated with potential disease progression, treatment failure, hospitalization and ADEs, all of which could be life-threatening²¹.

Measures to reduce and manage polypharmacy

Measures can be taken to limit polypharmacy to its truly legitimate and appropriate needs. Polypharmacy can be prevented by avoiding prescriptions for minor nonspecific or self limiting complaints. An accurate drug history is essential for patients on multiple drugs. This can be achieved by a regular medication review. (Several studies have proposed possible methods of reducing the number of medications for elderly patients). In prescribing to elderly patients the broad functional outcomes are usually the major therapeutic goal rather than the specific disease based outcomes. There are certain steps to be followed while prescribing in elderly patients

- ❖ To determine the efficacy in the elderly
- ❖ To determine the likely hood of adverse drug events in the older subjects
- ❖ To discuss harm benefit analysis with the patient and then decide the dosage regimen considering the age related changes in the disposition of and response to medications²²
- ❖ Monitoring the patient very carefully is essential in view of the paucity of clinical trial data in frail older patients and the marked increase in prevalence of adverse drug reactions

There are tools like Armor - A tool to evaluate polypharmacy in elderly patients²³. ARMOR is a stepwise approach for assessment of a geriatric patient who is receiving nine or more medications; seen for initial assessment; seen for falls / behaviours; or admitted for rehabilitation. The clinician first observes heart rate, blood pressure (postural), and oxygen saturation rate at rest and with activity. A physician assessment and physical examination is followed by the following steps:

A = Assess the individual for total number of medications and for certain group of medications that have potential for adverse outcome e.g. Beta blockers, Antidepressants, Antipsychotics, pain medications, vitamins and supplements

R = Review for possible Drug-drug interactions, drug-disease interactions.

M = Minimize nonessential medication; eliminate medications that clearly lack evidence for their usage. Eliminate medications whose risks outweigh benefits and that have high potential for negative impact on primary functions.

O = Optimize by addressing duplication, redundancy, adjust drugs according to the hepatic & renal functional status, adjust oral hypoglycaemics to blood sugar target HbA1C

R = Reassess heart rate, blood pressure (postural), oxygen saturation at rest and activity.

DISCUSSION

The use of multiple medications often termed polypharmacy is recognized as a potentially serious problem especially in the management of elderly patients. Polypharmacy can be negative or positive; the potential risks of polypharmacy are evident and need to be balanced with the benefits of use of multiple medications required to cure, slow the progression or reduce symptoms of disease.

Several studies have shown the increased incidence of hospitalization due to falls as a result of functional disability, impaired cognition due to the usage of multiple medications. Several authors have reported an increase in the occurrence of adverse drug reactions when the number of medications is increased. Assessment of the need for polypharmacy and managing polypharmacy is important to meet the therapeutic goals of correcting functional, cognitive factors in addition to the morbidity & helps in better compliance in treating geriatric patients.

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CONCLUSION

Polypharmacy is common and needed while treating elderly patients. Even though many studies proved the relationship between increased number of drugs and negative outcomes like adverse events, falls, hospitalization, more studies are needed to find out the measures for reducing polypharmacy

Steps to reduce polypharmacy include better communication between the physician, nurse and pharmacist. Increasing the awareness of the physicians treating elderly on the occurrence of adverse events may help some extent. The elderly patients should also be made aware of the consequences of polypharmacy and convinced about revealing all the facts about the drugs they are already taking when they visit a physician. They should be discouraged to take unnecessary alternative medicines and OTC drugs. Even though polypharmacy is a double edged weapon the right use of it with better understanding of the outcomes is always beneficial to the elderly patients. Multidisciplinary teams, regular medication and reconciliation review can identify and reduce medication related problems.