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THE NEEDS OF UNIQUE EMPLOYMENT OF DRUGS ON HEALTH CARE OF GERIATRIC PATIENTS - A REVIEW

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ABSTRACT

Geriatrics is a branch of general medicine concerned with clinical, preventive, remedial and social aspects of illness in the elderly. The term 'elderly' generally indicates to patients aged 65 years or over. The drug utilization study is to give rational use of drug in population and enhance the pattern of drug use monitoring. With increasing age, chronic diseases are common in older patients. Older patients likely to be more sensitive to the effects of medication compared to younger patients. The physiological changes that takes place with advancing age which could be resulting in changed pharmacokinetics and pharmacodynamic for many drugs. When the population of elderly increases, the reduction in mortality rate which raises in health related problem. Multiple disease and multimorbidity lead to use of multiple drugs, condition known as polypharmacy. Polypharmacy lead to increased demand of care, increase in hospital admission and higher costs for health care system. Multiple drug therapy which may possibly leads to adverse drug reactions, drug-drug interactions, medication errors, non-compliance and lower adherence of drug therapy. The combination self medication and prescribed drug treatment which may affect the quality of life of the patient. To assess the appropriate use of drugs prescribed for elderly, Beers defined criteria for potentially inappropriate medicines. To reduce polypharmacy, the clinical pharmacists and other health care professionals will find the policy in this series supportive of their own efforts to reduce polypharmacy. This review is an aim to express the importance of drug utilization studies in older patients for safe and effective treatment and its implementation lags.

KEYWORDS: Geriatrics, Drug utilization, Polypharmacy, Non-compliance

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INTRODUCTION: IMPORTANCE OF DRUG UTILIZATION RESEARCH

According to WHO, drug utilization research is the marketing, distribution, prescription and use of drugs in the society which develop medical, social and economic consequences¹. Nowadays, a Drug Utilization study is used as a possible tool in the assessment of health care system. The goal is to allocate rational use of drug in population. Drug utilization research gives to rational drug use by describing the drug use pattern and its interventions. It allows to determine whether the interventions undertaken increase the pattern of drug use observing and estimating the pattern of drug use. Drug Use Evaluation goal is to understand how and why drugs

are used and to boost the drug use and health result. In United States drug utilization research has been move forward at an institutional level or as a section of local health programs. European drug utilization studies have been developed to explain and measure pattern of drug use in specific category².

Focuses on health care of elderly people

Geriatrics is a branch of medicine that deals with the health and care of elderly people. It aims to support health by restricting and treating diseases and ailments in older adults³. The age 65 and above is considered as geriatrics, studying of geriatrics is called gerontology⁴. Geriatric medicine is the branch of general medicine comprise of medical or clinical aspects of gerontology⁵. It make an effort to achieve to

assess how geriatric medicine is being taught world-wide, the WHO Ageing and Life Course Programme (ALC) devised a study, the Teaching Geriatric in Medical Education study (TeGeME), and asked the International Federation of Medical Students' Associations (IFMSA) to be a close confederate in the implementation.

The main objective of the TeGeME study was to assess how ageing issues are included into the medical curriculum world-wide. One of the main characteristics of the world population over the last few decades has been a sudden increase in the elderly people in both developing and developed countries. This vogue will rise over the next two or three decades. The total number of older people (defined as 65 years of age and over) world-wide is expected to increase from 2000 to 2025. Currently, about 60% of older persons live in the developing world. This number is expected to increase to 605 million in 2000 to (75%) 843 million by the year 2025. Figure 1 shows the proportional increase of older persons among the total population for selected developing countries. In 1975 the percentage of 60 years old people was high in Lebanon and China and in 2000 China has high percentage of people 60 years. However, in 2025 further it expects to be increases in percentage of old people in China, Thailand and Brazil.

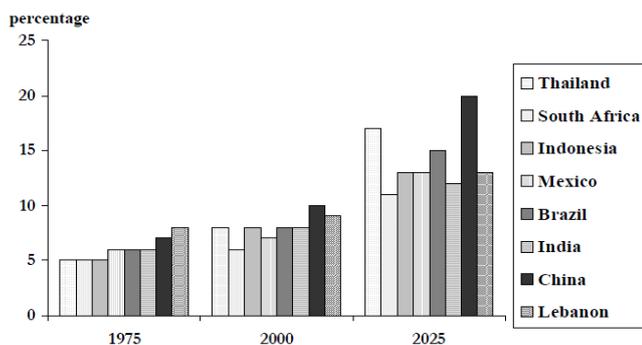


Figure 1 depicts the percentage of people 60 years and over in some developing countries

Increased comorbidity, Aging and complexity in management of therapy to elderly people

In 1950 the average life expectancy at birth (LEB) in most of the developing world was all over 40 years. By 2000 it had increased to 64 years and it is projected to reach 71 years by 2025. With the exception of those Sub-Saharan countries, which have been hit hardest by the HIV/AIDS epidemics, the LEB has continually raised in all developing countries over the last few decades. For example, in India LEB for both sexes increased from 53 years in 1975 to 64 years in 2000 and is expected to reach 72 years by 2025 (Figure 2). These fast increases in Life expectancy at birth result sudden fall in mortality rates, especially through

the prevention and/or treatment of diseases related with premature death. The expeditious increase in population of elderly people which leads to reduction in mortality rate and higher health related problems.⁶ The presence of multiple chronic conditions is also correlated with lower health related quality of life (HRQOL). Disease rigidity also influences HRQOL. Vascular, upper gastrointestinal and musculoskeletal systems have strong unfavorable effects on HRQOL. Among combinations of systems, the respiratory and cardiac combination is of specific concern because of a synergistic negative effect⁷. Dementia, delirium, parkinsonism, stroke, osteoporosis, arthritis, myocardial infarction, cardiac failure, leg ulcers, urinary incontinence and constipation are the major diseases caused by elderly people⁸. However four important chronic conditions have high prevalence among older adults such as hypertension, dyslipidemia, diabetes, and heart disease⁹. People with several comorbid complaints and functional disabilities (so-called complex patients) and generally, five factors that may contribute to the complexity of older patients (Table 1)¹⁰.

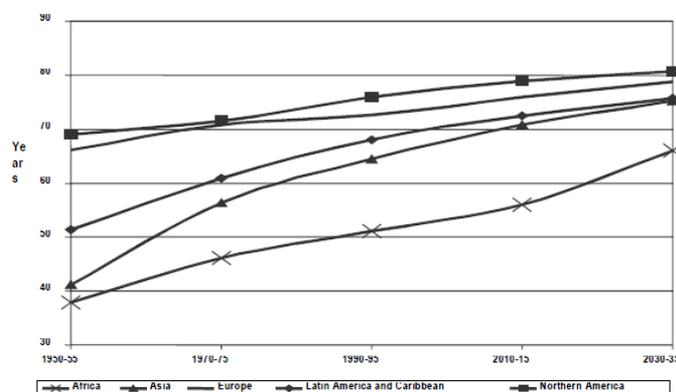


Figure 2. Shows graph of life expectancy at birth by world regions

Table 1. Shows some of five factors that contribute to the complexity of cases with older patients¹⁰

Factors	Theme
Not being “in charge”	Lack of oversight on care delivered
	Need of an efficient registration system
	Professional care is suboptimal
Diverse views on needed care	Patient declines treatment
	Family members of the patient pressure the GP

Coming across the boundaries of medicine	GPs doubt the benefits of treatment Symptoms cannot be determined
Limits to providing social care	No informal care system Not adequate time Not sufficient information on available social sustain options
Ill-equipped	Not enough information on specific diseases No professional hold for GP (referral options, support of specialized nurses)
GP-general practitioners	

Physiological differences in elderly patient

A survey done in India that people aged from 65 to 90years have five or more health problem. Diabetes, hypertension and arthritis were the most frequently reported diseases¹¹.

Aging results, many physiological changes that could apparently affect the pharmacokinetics of the drugs. The molecular and cellular changes may vary the response of drugs in the elderly⁸. Pharmacokinetic changes include an increase in volume of distribution of lipid soluble drugs (hence prolongation of elimination half-life) and a reduction in renal and hepatic clearance. Aging effects, reduces gastric acid secretion and gastric emptying, reduced motility and decreased intestinal blood flow, which will lead to reduction in first-pass metabolism¹². First pass metabolism may be decreased, due to reduction liver blood flow rate and intrinsic metabolic capacity of the liver. This will lead to increased bioavailability of some drugs after oral administration, particularly drugs having high first-pass extraction⁴. Drug utilization studies on geriatric population plays a vital role of drugs that are used by elderly people³. The elderly respond differently to drugs than do younger people. Potentially altered drug action and increased drug toxicity observed in the elderly, owing to their physiological response is much more versatile and probability of drug action is much less certain¹³. (Table.2).

Table 2 illustrates the effects of physiological changes on pharmacokinetics in elderly patients

Absorption	Metabolism
<ul style="list-style-type: none"> - Increased gastric pH - Delayed gastric emptying - Decreased splanchnic blood flow - Decreased intestinal mobility 	<ul style="list-style-type: none"> - Decreased hepatic mass - Decreased hepatic blood flow - Decreased Phase I metabolism (Oxidative) - Unaltered phase II metabolism (Conjugation & Acetylation)
Distribution	Elimination
<ul style="list-style-type: none"> - Increased body fat - Decreased total body water - Decreased Serum albumin - Increased X-acidic glycoprotein - Cerebral flow 	<ul style="list-style-type: none"> - Decreased Creatinine Clearance - Decreased GFR - Decreased tubular filtration - Creatinine

Age-associated pharmacodynamic changes, i.e. changes in the type, intensity and duration of drug action, have been associated with changes in receptor function, changes in the homeostatic mechanisms, and reduced reserve capacity. It is important to recognize that these changes, which can differ greatly among patients, may be accountable for an increased incidence of adverse drug reactions and therapeutic failure⁹. The main difficulty faced by geriatric population is the use of incorrect medications. They have chronic diseases and consume more number of medications¹⁴.

Need of drug utilization studies in India

Diabetes and hypertension are the most common conditions along with many other chronic diseases¹⁵. Multiple disease and multimorbidity lead to use of multiple drugs, condition known as polypharmacy^{15, 16}. Due to concurrent use of multiple drug therapy which leads to several health problems and which will elevate drug-drug interactions, adverse drug reactions and lower adherence of the drug therapy¹⁷. Polypharmacy lead to increased need of care, increase in hospital admission and higher costs for health system. The combination self medication and prescribed drug treatment which may influence the quality of life of the patient¹⁸. Prescribers always think about whether non-pharmacological therapy will be suitable before prescribing additional medications to older people¹⁶. To evaluate the appropriate use of drugs prescribed for elderly, Beers defined a criterion for potentially inappropriate medicines (PIMs) in 1997 and updated in 2002 and 2012¹⁹. Beers criteria can be classified into three categories, such as category 1, category 2 and category 3. So it is used as a standardized tool in improving medication safety in elderly age group^{20, 21}. Understanding age associated changes and pharmacodynamic factors, avoid polypharmacy and take regular review of all drugs will help in the rationalization of drug prescribing, decrease in drug related morbidity and price of drug therapy¹¹.

The reduction in polypharmacy and circumvention of inappropriate medications is a common goal in the care of older persons, regardless of setting²². To reduce polypharmacy, the clinical pharmacists and other health care professionals will find the procedure in this sequence promote their own efforts to reduce polypharmacy. With recent regulatory and payment changes, clinical pharmacists are even better placed to actively take part in optimizing therapy in the elderly. Those who develop clinical guidelines will take note and consider how they might include “deprescribing” guidelines to further support minimizing and stopping of medications when proof is limited or when pharmacokinetic and pharmacodynamic parameters have impact on medication distribution and effectiveness change with age²³. While integrative teams and continuous medication reconciliation and review can identify and reduce medication-related problems, tools to decrease the use of high-risk/lowbenefit medications can aid the individual clinician to make better prescribing. Numerous criteria, tools, algorithms, and scoring systems have been evolved for use in an extensive range of areas from long-term care to the older patients.

Patient-Focused Drug Surveillance was an intervention study for elderly persons. The intervention concerned with a physician-led, patient-focused manner, taking into account the patient’s health condition to properly correct medication therapy and reduce polypharmacy²³. A balance and cautious approach are very important for drug prescribing to the older people. Drugs should be avoided when the risks associated with their use in an elderly patient outweigh the potential benefits. Dose selection and adjustment is necessary. Dose selection and adjustment not only by age, but also weight, renal function, hepatic function and other medications⁴. By using proper counseling and non-pharmacological therapy, reduce medication number and increase medication adherence.

Polypharmacy and older age have been shown to be essential risk factors for potential drug interactions and a high rate of prescribing potentially inappropriate medications among elders. It specifies that particular attention should be given when prescribing drugs to patients already obtaining drugs and to elderly patients, assessing the risk of drug-related problems²⁴. Therefore the use of multiple medications may be unavoidable in patients with multiple co-existing medical conditions, care must be taken to avoid unnecessary polypharmacy⁴.

Prevalence of polypharmacy was more and is usually inevitable in the elderly. This shows that there is a necessity for multidisciplinary, multifaceted & multisector approach which may enhance drug safety & adherence in the older adults²⁵. So drug utilization

pattern may finally help in improving the quality of healthcare given to the geriatric patients²⁶.

Conclusion

The study concluded that the pattern of drug use in geriatric patients. Geriatrics are suffered from chronic illness. Hypertension, diabetes and cardiovascular disease are most common. Polypharmacy and high rate of potentially inappropriate medicines leads to drug related problems to elderly patients. The incidence of adverse drug reactions, drug interaction and other adverse outcomes such as medication errors and drug related medication admissions are increased. So drug utilization studies are important in older patients for safe and effective treatment. The clinical pharmacist can play a vital role in promoting rational and safe medication in elderly patients.

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