

## A Study on Drug Utilization in Geriatric Patients

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### Abstract

**Objectives:** This present was to evaluate the drug utilization and clinical conditions in geriatric patients.

**Methods:** A total of 100 geriatric patients with age group 65 to  $\geq$  80 years were enrolled in this study. Rationality of prescriptions was analysed using WHO prescribing indicators. This includes five indicators which are - average number of drugs per prescription, drugs prescribed by generic name, number of antibiotics prescribed, number of injections prescribed, and drugs prescribed from essential medicines list.

**Results:** Majorities of patients 63(63%) were in age group of 65-70 years. 67(67%) patients were males, and 33(33%) patients were females. The most common condition for admission in medical ward were cardiovascular disorders 33(33%) followed by respiratory distress 21(21%), genitourinary disorders 18(18%) and gastrointestinal conditions 7(7%). A total 834 drugs were prescribed. Average drug prescription was 8.34.

**Conclusions:** Preponderance of geriatric patients are more in male. Most common conditions are cardiovascular disorders followed by respiratory disorders and genitourinary disorders in geriatric patients. Hence, geriatric patients are more prone to multiple disorders and more dependent on multiple drugs. So that, health care concerns should always monitor the drugs utilization to minimise the risk for adverse effect. Safer drug utilization may help in improving the quality of life in geriatric patients.

**Keywords:** Geriatric patients, Drug utilization, Gender.

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### Introduction

The consumption of drugs among elderly segment of society has been maximum and many of them use at least three prescribed drugs concurrently, one of the plausible explanations for the usage of large number of medicines being the prevalence of comorbidities [1]. Population ageing is

regarded as the most discussed global phenomena in the present era. Countries with vast population like India have a large proportion of people aged 60 years or above. India is ageing much faster than expected and the geriatric population may constitute nearly 20 % of the total

population by 2050. The demographic trends suggest that between the years 2000-2050, the Indian population in its 60s and above will increase by 326%, while those in the age group of [2] 80 years and above will increase by 700% – the fastest growing group. Geriatrics is the branch of medicine which deals with clinical, preventive, remedial and social aspects of illness in the elderly. Since elderly are usually excluded from clinical trials, knowledge about the efficacy and safety of drugs remains obscure for this age group. They have limited regenerative abilities and are more prone to diseases as [3] compared to adults. Studies have concluded that the elderly population which was about 550 million in the year 1996 is expected to double by the year 2025 [4].

Considering the physiological changes that occur with aging and its impact on the pharmacokinetics and pharmacodynamics of drugs, it is essential to monitor drug effects, especially adverse drug reactions (ADR) and drug interactions, vis-a-vis clinical outcome in geriatric patients [5]. To understand these processes better and in order to make the drug use rational and safer, it is necessary to study the pattern of drug use in geriatric patients. As the number of medicines taken by geriatric patients and the incidence of ADR is more in this age-group, it becomes increasingly important to study patterns of drug use. Very few studies on drug utilization in geriatric patients are available and, to the best of our knowledge, no such study has been conducted in India so far. For these reasons we undertook the present study with the broad aim of understanding the pattern of drug use in geriatric patients and the influence of factors like age, gender, education status, socioeconomic status, etc. on drug prescribing in geriatric patients [6]. Objectives of our study was to evaluate the

drug utilization and diagnosis in various age group of geriatric patients.

### Materials & Methods

This present study was conducted in Department of Pharmacology with the collaboration of Department of Medicine, Jawahar Lal Nehru Medical College, Bhagalpur, Bihar during a period from January 2021 to September 2021. Entire subjects/Attendants signed an informed consent approved by institutional ethical committee, of Jawahar Lal Nehru Medical College, Bhagalpur was sought.

A total of 100 geriatric patients with age group 65 to  $\geq$  80 years admitted in the Department of Medicine were enrolled in this study. Patients unwilling to participate in the study, patients below 65 years of age, Patients admitted in intensive care unit and patients visiting the outpatient department were excluded from this study.

### Methods

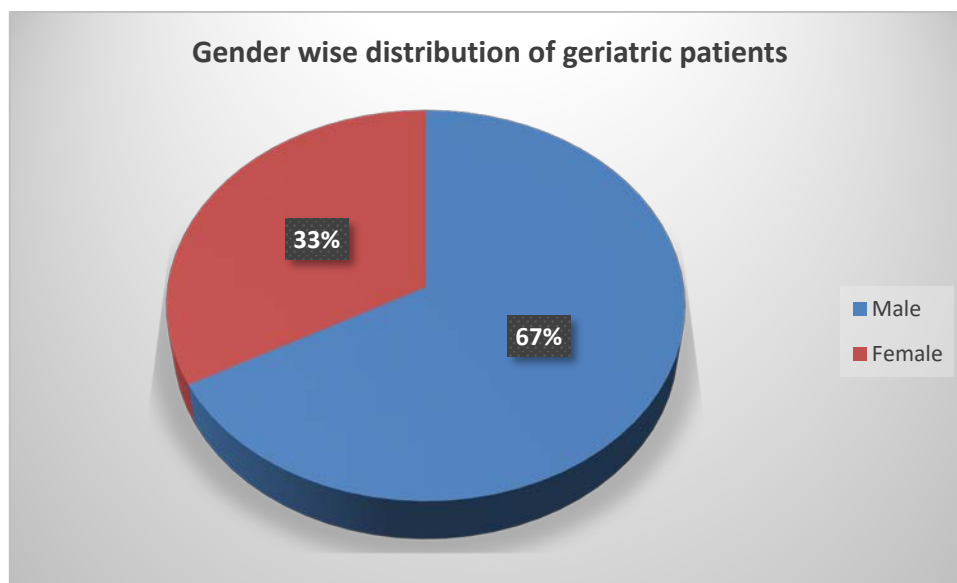
The prescribing details from each prescription were recorded in a case study form. This included age, gender and diagnosis of patients. Rationality of prescriptions was analysed using WHO prescribing indicators [7]. This includes five indicators which are - average number of drugs per prescription, drugs prescribed by generic name, number of antibiotics prescribed, number of injections prescribed and drugs prescribed from essential medicines list (WHO Model List of Essential Medicines 20<sup>th</sup> List, March 2017 [8].

### Observations

A total of 100 geriatric patients with age group 65 to  $\geq$  80 years were included. Majorities of patients 63(63%) were in age group of 65-70 years. 67(67%) patients were males, and 33(33%) patients were females.

**Table 1: Age wise distribution of geriatric patients.**

Age group (Years)	No. of patients	Percentage
65-70	63	63%
71-75	18	18%
76-80	10	10%
>80	9	9%
Total	100	100%

**Figure 1: Gender wise distribution of geriatric cases.**

The most common condition for admission in medical ward were cardiovascular disorders 33(33%) followed by respiratory distress 21(21%), genitourinary disorders 18(18%) and gastrointestinal conditions 7(7%) which are depicted in Table 2.

**Table 2: Disease condition in geriatric patients.**

Diagnosis	No. of cases	Percentage
Musculoskeletal disorders	2	2%
Dermatological disorders	1	1%
Cardiovascular disorders	33	33%
Respiratory disorders	21	21%
Genitourinary disorders	18	18%
Miscellaneous	5	5%
Gastrointestinal disorders	7	7%
Renal disorders	5	5%
Endocrine disorders	4	4%
Neoplastic disorders	1	1%
Neurological disorders	3	3%
Total	100	100%

In this present study, total 834 drugs were prescribed to 100 geriatric patients admitted in department of Medicine. The prescriptions were evaluated using WHO prescribing indicators as listed in Table 3.

**Table 3: WHO Prescribing Indicators.**

WHO Prescribing Indicators	Frequency
Average number of drugs per prescription	10.23 ± 3.14
Percentage of drugs prescribed by generic name	1224 (59.8%)
Total number of antibiotics prescribed	319 (15.5%)
Total number of injections prescribed	854 (41.7%)
Total number of drugs prescribed from WHO-EML	849 (41.5%)

## Discussions

Assessment of drug use patterns with the WHO drug use indicators is becoming increasingly necessary to promote rational drug use in developing countries [9,10]. Rational use of drugs can be analyzed using WHO drug use indicators. Among the elderly, potentially inappropriate medications (PIMs) have been found to be a common cause of morbidity and mortality [11]. Beers Criteria, which was initially released in 1997 and updated in 2002 and 2012, is an important criterion for safe use of medicines among the elderly [12, 13]. The Beers Criteria consist of medications to be avoided in the elderly irrespective of the patient's diagnosis, and those that should be avoided when taking a particular diagnosis into account [14].

In this present study, majorities of patients 63(63%) were in age group of 65-70 years. The most common conditions were cardiovascular disorders 33(33%) followed by respiratory distress 21(21%), genitourinary disorders 18(18%). Another similar study conducted earlier showed that majority of elderly [15,16] patients were admitted due to cardiovascular disorders.

There was male preponderance (67 %) which is in accordance with a study conducted earlier where 60.42% of total 12 patients were males [17].

In this present study, total 834 drugs were prescribed to 100 geriatric patients admitted in department of Medicine. Average number of drugs were prescribed 8.34.

The prescriptions were analyzed for rationality by using WHO prescribing indicators. The average number of drugs per prescription was 10.23 ± 3.14 which showed polypharmacy. This finding is considerably higher than the standard value (1.6 – 1.8) [18]. This could be due to the fact that geriatric patients are more prone to multiple diseases. These findings are higher than the findings obtained in similar other studies conducted earlier [17].

It was observed that there is low prescribing of drugs by generic names 6 (59.8%) as seen in similar other studies. However, the derived standard value suggests that 100% of the drugs should be prescribed by their generic names [18]. In this study, the percentage of encounters in which an antibiotic was prescribed was 21.23 % which is almost similar as the derived standard value (20.0 - 26.8). The results of this study are consistent with similar other studies conducted earlier [19,20,21]. The percentage of encounters with injection was 42.14% which is [18] higher than the derived standard value (13.4 - 24.1). It was seen that 85% of injections were prescribed in department of medicine. The findings in the present study are almost similar as compared to another study which concluded increased frequency of hospitalized patients (84.6%) receiving injections [3]. The percentage of drugs prescribed by WHO EML was 41.5% (35.1% of drugs were prescribed in medicine and 47.6% in surgery) which is low as compared to another study [23]. These findings are quite low when compared with the derived standard value

for this indicator which is 100% [18]. The gender distribution of our study subjects is in accordance with studies conducted by Shah et al., [6] Nayaka et al., [1] Binod et al., [22] Kolhe et al., [23] and Singh, [24] where the male patients were predominant. The morbidity pattern and the organ systems affected were also similar to the studies done by others.

Average number of drugs were prescribed in our study 8.34. Which is almost similar to the study that was conducted by Shah et al. [6] where the average number of drugs per prescription was 7.3 and contrary to the studies done by Weiss et al. [25] and Shenoy et al. [26] where the number was 5.

### Conclusions

This present study concluded that the preponderance of geriatric patients is more in male at age 65-70 years. Most common conditions are cardiovascular disorders followed by respiratory disorders and genitourinary disorders in geriatric patients. Hence, geriatric patients are more prone to multiple disorders and more dependent on multiple drugs. So that, health care concerns should always monitor the drugs utilization to minimise the risk for adverse effect. Safer drug utilization may help in improving the quality of life in geriatric patients.

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