A RETROSPECTIVE STUDY ON RATIONAL PRESCRIBING PATTERN FOR GERIATRIC PATIENTS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Ageing referred as irreversible change in organ function which occurs over time during the absence of injury and illness. Polypharmacy in geriatric patient's leads to many problems, there is a need of rational use of medications and continuous monitoring of drug-drug interactions and adverse effects. This study aims to focus on prescribing pattern of various drugs in geriatric patients and to assess the rationality using Beers criterion. This is a retrospective, observational study, which was over a period of March 2015 to September 2015 and it was carried out in Chennai. A total of 404 case sheets of inpatients ≥60 years in general medicine, surgery and orthopedic wards were reviewed. Relevant information was recorded in a specially designed proforma and data was evaluated. Most of the cases were from respiratory system (27%), followed by cardiovascular system (21%). The most commonly prescribed drugs were antimicrobials (19.9%). Polypharmacy was observed in 340 (84.2%) patients. This study has shown the patterns of diseases prevalent in geriatric patients, drug use among them and also suggests that drugs to be avoided in geriatrics.

KEYWORDS: Geriatrics, Prescribing pattern, Polypharmacy, Beers criterion.

INTRODUCTION

Ageing referred as irreversible change in organ function which occurs over time during the absence of injury and illness. Normal ageing and diseases associated with ageing are two separate entities. Normal ageing refers to those normal deteriorative processes that all human beings will experience if they live long enough, such as decreased bone mass, osteoarthritis and lens cataracts (i.e. probabilistic ageing) include dementia, hypothyroidism, stroke, and congestive heart failure. The effects of ageing cause elderly bodies to process and respond to medicines differently than those of younger people (**Napolitano F *et al.*, 2013**). Age-related changes in the liver, kidneys, central nervous system, and heart are among the contributing factors causing elderly people to be more vulnerable to overdose and side effects and ignorance of these changes in treatment leads to irrational therapy. Various studies conducted in developing and developed countries reveal irrational drug use and inappropriate prescriptions are the global phenomenon's which requires huge attention (**Bradley MC *et al.*, 2014**). WHO defined rational use of medicine as "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community".

Number of drugs used by geriatric patients is standing as biggest challenge to the practitioners to achieve rationality so it is advised to prescribe fewest medications to achieve good outcomes (**McLeod PJ *et al.*, 1997**). Prescribing medications using a standardized mode has been reported to improve the quality of prescriptions. Several assessment tools have been developed to measure potentially inappropriate medication (PIM) for older peoples. Beers criteria is the most frequently used tool to analyze the rationality of prescription. According to BEER's criteria inappropriately prescribed drugs are classified into the following categories: Category A: drugs that should be avoided in older adults, Category B: drugs that exceed maximum recommended daily dose, Category C: drugs to be avoided in combination with specific co morbidity. The objective of study was to evaluate the irrational prescription of drugs in the geriatric patients, to evaluate inappropriate prescribing with the help of Beers criteria, to investigate the occurrence of polypharmacy and to find out frequency of chronic diseases in geriatric patients.

MATERIAL AND METHODS

It was a retrospective observational study conducted for 6 months from March 2015 to September 2015 in a tertiary hospital, Chennai and a 420 bedded hospital, in which patients

aged ≥60 years and above were included. A total 404 patients were randomly enrolled in to the study on their visit to hospital and the study duration was 6 months. Patients who required ICU were excluded from our study. The study protocol was approved by the Institutional Ethics Committee.

RESULTS

In the study population 404 patients were enrolled, the patient demographics which include age wise distribution, gender wise distribution, reason for admission and number of days stay in hospital are shown in Table 1. The drugs prescribed for them are in different class as shown in Table 2. Number of drugs prescribed per day to the patient and also the route of administration of these drugs are enlisted in Table 3 and Table 4.

Frequency of use of inappropriate drugs in geriatric patients based on Beers criterion was assessed in Table 5. Percentage of appropriateness and inappropriateness in prescribing pattern is shown in Table 6.

Table 1: Demographic Characteristics of Study Population.

Study Characteristic	Data
No of patients enrolled (n=404)	
Male	224 (55%)
Female	180 (45%)
Age in years	
60-69	290 (72%)
70-79	81 (20%)
80-89	33 (8%)
Reason for Admission	
Musculoskeletal Disorder	78 (19%)
Respiratory Disorder	110 (27%)
Cardiovascular Disorder	85 (21%)
GI Disorder	42 (11%)
Infectious Disorder	33 (9%)
Endocrine Disorder	26 (6%)
Miscellaneous Disorder	30 (7%)
Duration of Hospital Stay	
0-5 days	48 (12%)
5-10 days	230 (57%)
10-15 days	84 (21%)
>15 days	42 (10%)

Table 2: Category of Drugs Prescribed.

Category of drugs	Number of drugs	Percentage (%)
Drugs acting on CVS	160	5.62
Minerals, Vitamins, Calcium	466	16.4
Drugs acting on Respiratory system	388	13.63
Drugs acting CNS	120	4.21
Drugs acting on GI system	510	17.91
Drugs acting on Hematological system	47	1.7
Antibiotics	566	19.9
NSAIDs	469	16.5
Others	120	4.21

Table 3: Number of drugs per prescription.

Number of drugs	Number of patients	Percentage (%)
5 drugs	68	16.84
5-8 drugs	200	49.50
>8 drugs	136	33.66

Table 4: Route of Administration.

Route of Administration	Number of patients	Percentage (%)
Parenteral	1160	42.41
Oral	1575	57.59

Table 5: Frequency Use of Inappropriate Drugs in Geriatrics Based on Beers Criterion.

Category	Name of drugs	Total Number of drugs	Percentage (%)
	Generally to be avoided in older patients		
A	Antispasmodic(Hyoscine, Scopolamine)	20	8.8
	NSAIDs	135	59.21
	Benzodiazepine	50	21.92
	Antibiotics	8	3.5
	Cardiovascular drugs	15	6.6
B	Drugs that exceed maximum recommended daily dose	-	-
C	Drugs to be avoided in combination with specific co-morbidity	-	-

Table 6: Percentage of Appropriateness and Inappropriateness drugs.

Variable	Number of patients	Percentage (%)
Appropriate	224	55.45
Inappropriate	180	44.55

DISCUSSION

This present study was conducted in a tertiary care hospital for the assessment of extent of rational use of medication in geriatric population. Data was collected from the case sheets

and a total of 404 patients were included in our study. Out of which, 224 (55%) were males and 180 (45%) were females. Since majority of patients were found to be male patients.

The study reported that majority of patients who got admitted in the hospital were in the age group of 60-69 years (72%) followed by the age group of 70-79 years (20%). This results revealed that geriatric patients suffered from numerous chronic diseases mainly affected by respiratory disorders (27%) followed by cardiovascular disorders (21%) **(Goudanavar P *et al*., 2016)**. Antimicrobial drugs (19.9%) followed by GI protective agents (17.91%) were the most commonly prescribed medications for geriatrics. Antibiotics were used mainly for respiratory disorders and most of the drugs were administered through oral route (57.59%). Polypharmacy is the most commonly used term which was defined as five or more medications that occurs in 40% of people and helps for the rationalize use of medications in geriatrics and optimize their health outcome. The number of drugs prescribed increases; there is chances of adverse drug events and likelihood of harm to the elderly population. In this study the average number of drugs per prescription was found to be 8.5 which are 4 times more than other studies **(Spinewine A *et al*., 2007)**.

Inappropriate prescribing of medications is common in geriatrics because they may suffer from various chronic diseases or multiple co-morbidities **(Cahir C *et al*., 2014)**. Currently there are number of medication assessment while looking beyond single disease management guidelines and considering the patient's complete scenario by considering all co-morbidities and medications being prescribed for a given patient to consider the patient as a whole and focusing on improving the overall health **(Runganga M *et al*., 2014)**. Polypharmacy tools or criteria including the Beers criteria, MAI and HEDIS were used to identify potentially inappropriate medications has some limitations of the tools and criteria in the everyday clinical setting were recognized **(Kovacevic VS *et al*., 2014)**. The Beers criteria which was used in our study, is a commonly used prescribing assessment tool based on a list of potentially inappropriate medications to be avoided in geriatric population. Category A drugs that should be avoided in the geriatrics and should not be prescribed forms a major category of inappropriate use of drugs. In our study, 228 drugs were enlisted under this category. NSAIDs prescribed to 135 (59.21%), followed by benzodiazepines were prescribed to 50 (21.92%) patients form the majority of potentially inappropriate medicines in category A. The duration of hospital stay was found 5-10 days in 230 (57%), followed by 10-15 days in 84 (21%) **(Monane M *et al*., 1998)**. It showed that polypharmacy incorporating a healthcare

setting included the use of five or more medications at hospital discharge, and the use of 10 or more medications during hospital stay were associated with adverse outcomes including mortality, falls and adverse drug reactions **(Tangiisuran B *et al.*, 2009)**.

CONCLUSION

Polypharmacy in geriatric patients is highly prevalent due to many factors like presence of chronic diseases and taking OTC medicine. It's not easy to avoid poly pharmacy but at the same time care should be taken to prescribe fewest drugs, achieve rationality in treatment, avoid prescribing inappropriate medications and drug-drug interactions. This is one of the areas where clinical pharmacist is actually needed to closely monitor the therapy and patient outcomes.

CONFLICT OF INTERESTS

The authors declare no conflicts of interest.

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