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STUDY OF DRUG USE PATTERN IN GERIATRIC PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL- A PROSPECTIVE & OBSERVATIONAL STUDY

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ABSTRACT

Geriatrics is the branch of medicine that deals with the problems and diseases of old age and aging people. Indian elderly constitute 12.8% of the global elderly population. The elderly usually have multiple medical problems, requiring prescription drugs to treat diseases and to prevent complications arising from them. The elderly use more medications than any other age group. This high rate of drug use has been attributed in part to the accumulation of disease with ageing. **Objective:** Thus the current study aimed to assess the drug use pattern in elderly by understanding age-related changes in pharmacodynamics and pharmacokinetics factors which helps to achieve better health care. **Method:** This was a prospective and observational study conducted over a period of 6 months from January 2013 to June 2013 by using a well designed and validated patient data collection form to collect the study data. **Result:** The number of drugs prescribed during this study was 1-2 number of drugs (0.0%), 3-5 number of drugs (22 patients i.e., 24.4%), 6-10 number of drugs (56 patients 62.2%) and >10 number of drugs (12 patients i.e., 13.3%). **Conclusion:** The current study concluded with an association between the practice of polypharmacy and drug-related problems mainly ADRs and Drug interactions. Clinical pharmacist intervention can help the prescriber in selecting a regimen which contains a lesser number of drugs to prevent the occurrence of drug-related problems.

KEYWORDS: Geriatrics, Druguse pattern, Polypharmacy, ADRs.

INTRODUCTION

Geriatrics is the branch of medicine that deals with the problems and diseases of old age and aging people. Indian elderly constitute 12.8% of the global elderly population. With the increasing elderly population, geriatrics is emerging as a clinical specialty in India. The elderly population is increasing rapidly worldwide. India's population ages 60 and older is projected to climb from 8 percent in 2010 to 19 percent in 2050, according to the United Nations Population Division (UN 2011). By mid-century, India's 60 and older population is expected to encompass 323 million people, a number greater than the total U.S. population in 2012.

The higher incidence of chronic diseases and degenerative pathologies increases the demand for prescription medicines to treat these conditions and to provide quality of life and well being, which renders older susceptible to the risk of polypharmacy and drug-related illness. Gaining insight into the physician's prescribing patterns to identify a prescribing problems is the fundamental step in improving the quality of prescription and patient care.[1]

The elderly usually have multiple medical problems, requiring prescription drugs to treat diseases and to prevent complications arising from them. The elderly use more medications than any other age group. This high rate of drug use has been attributed in part to the accumulation of disease with ageing.[2]

Around 20% of people over 70 years take five or more drugs. In the past decade, the average number of items prescribed to people aged 60 and over has almost doubled from 21.2 to 40.8 items for each person each year.[3]

There is still a very limited evidence base underpinning geriatric prescribing and the complexities of geriatric pharmacology often appear to be under-appreciated both in the design of clinical trials and prescribing of medications.[4]

METHODOLOGY

Study Site
This study was conducted at Adichunchanagiri Hospital and Research Center (AH&RC), B.G.Nagara Mandya Dist Karnataka, India.

Study Design
This was a prospective and observational study conducted over a period of 6 months from January 2013 to June 2013.

Study Criteria
Inclusion Criteria
- Patients of either sex above 60 years.
- Inpatients from the medicine department.

Exclusion Criteria
- Patients who are not willing to give consent.
- Mentally retarded patients.

Source of Data
Patient data relevant to the study was obtained from the patient case records, patient/patient caretaker interview at the bedside, medication charts, and lab reports.

Study Procedure
Patients who fulfilled eligibility criteria were enrolled after obtaining consent from the patient/patient caretaker. A well designed and validated patient data collection form was developed and used to collect the study data.

Method of Data Collection
Patients who satisfy the inclusion criteria were enrolled in the study. After obtaining their written consent all the data regarding demographics, medical and medication history current treatment & other medical details were collected in a specially designed & validated patient data collection form.

Research And Ethical Committee Approval
The study was approved by the Institutional Research and Ethical committee of AH & RC, B.G.Nagara.

RESULTS

Table 01: AgeWise Distribution.

Age in years	No. of patients	%
60-70	61	67.8
71-80	24	26.7
81-90	4	4.4
>90	1	1.1
Total	90	100.0

Age distribution of patients in this study site was 60-70 years 61 patients (67.8%), 71-80 years 24 patients (26%), 81-90 years 4 patients(4.4%) and >90 years 1 patient (1.1%).

Table 2: Diseases Diagnosed in the Study Population.

Diagnosis	No. of patients (n=90)	%
COPD	16	17.8
HTN	17	19.3
DM	10	11.1
IHD	6	6.7
Acute Exacerbation of Bronchial Asthma	4	4.4
Jaundice	2	2.2
Pulmonary TB	3	3.3
CVA	2	2.2
Type 2 DM	2	2.2
Osteoarthritis	2	2.2
Gastrointestinal infections, Renal disorders, Hepatic diseases, Bacterial & Viral infections, Etc.	26	28.6

(COPD – Chronic Obstructive Pulmonary Disease, HTN – Hypertension, DM- Diabetes Mellites, IHD- Ischemic Heart Disease, TB- Tuberculosis, CVA- Cerebrovascular accident).

Patients recruited for this study were diagnosed with different morbidities like COPD 16 patients (17.8%), Hypertension 14 patients (15.6%), DM 10(11.1%), IHD 6 patients (6.7%), Acute Exacerbation of Bronchial asthma 4 patients (4.4%), Essential Hypertension 3 patients (3.3%), Jaundice 2 patients (2.2%), Pulmonary TB 3 patients (3.3%) and followed by the other diseases 22 patients (28.6%). **(Table no 02).**

Table 03: Drugs Used in the Study Population.

Drugs	No. of patients (n=90)	%
3RD GEN. CEPHALOSPORIN	26	28.8
NSAIDS	11	12.2
CORTICOSTERIODS	7	7.8
SHORT ACTING INSULIN	6	6.7
ACE INHIBITORS	4	4.4
BIGUINIDES	3	3.3
DIURETICS	9	10.0
NITRATES	3	3.3
HMG COA REDUCTASE INHIBITOR	3	3.3
RNTCP CAT	3	3.3
ANTI CONVULSION	2	2.2
ANTIVIRAL	2	2.2
OPIOID AGONIST	2	2.2
PROTON PUMP INHIBITOR	2	2.2
NARCOTIC ANALGESIC	2	2.2
ADRENERGICS	1	1.1
ANGIOTENSIN RECEPTOR BLOCKER	1	1.1
CALCIUM CHANNEL BLOCKER	1	1.1
H2 RECEPTOR ANTAGONIST	1	1.1
SULFONYLUREAS	1	1.1

The prescribing pattern of medications for this study group is shown in **Table no 03.** Anti-biotics were the most prescribed class of drugs (N=27, 30%) where 3rd Generation Cephalosporin (Ceftriaxone) being the most prescribed class of antibiotics. Analgesics ranked second (N =11, 12.2%) where aspirin was the most prescribed analgesic. While cardiovascular drugs such as anti-hypertensive, Diuretics (N=9, 10.0%). Endocrine metabolites were prescribed as short-acting insulin (N=6, 6.7%) followed by other class of drugs which were prescribed according to the patient's diseases respectively.

Table 04: No of drugs prescribed.

No. of drugs	No. of patients	%
1-2	0	0.0
3-5	22	24.4
6-10	56	62.2
>10	12	13.3
Total	90	100.0

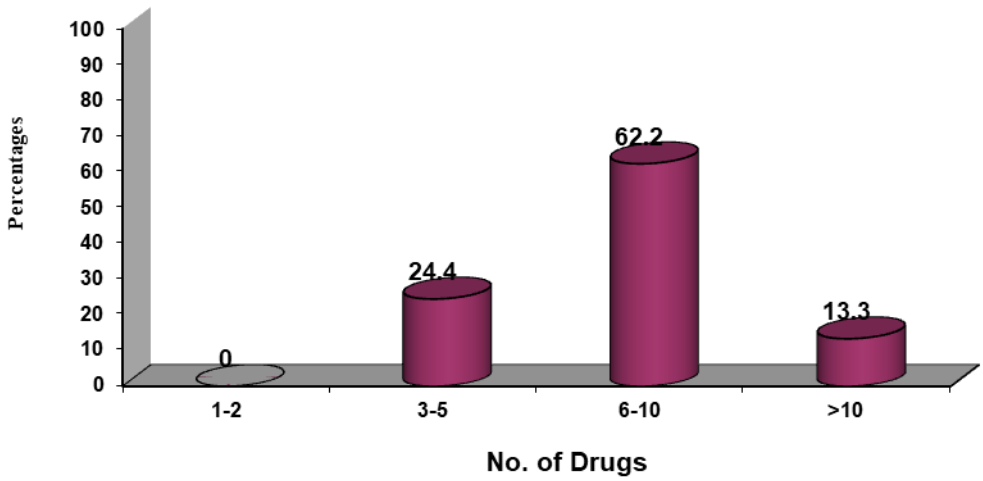

Figure 01: No of drugs prescribed.

The number of drugs prescribed to the enrolled patients during this study was shown in **table no. 04 & fig no 01**. Among 90 study patients, 56 patients (62.2%) were prescribed with 06-10 drugs followed by 22 patients (24.4%) were prescribed with 03-05 drugs, and 12 patients (13.3%) were prescribed with more than 10 drugs.

DISCUSSION

It was a prospective, observational study in which a total of 110 patients were approached out of which 90 satisfied the inclusion criteria and were enrolled for the study.

Demographic Details of Study Population

The study data showed that the number of male patients was more (60%) than the female patients (40%) in which the patients with age group between 60-70 years (67.8%) were leading the study population, Which showed that it was this group of population prevailing and visiting the hospital; it is a matter of fact that age is an important variable affecting the pharmacokinetics of drugs.[5]

Disease Distribution of Study Population

Moreover, when the disease distribution pattern was seen amongst the study population it was found that COPD (17.8%) was the most prevailing disease which depicts the lifestyle of the population as COPD may be as a result of prolonged exposure to smoke, maybe due to occupational exposure or due to high rate of cigarette/beedi smoking. As, it is a rural area therefore the literacy status and awareness of the general population about the harmful effects of smoking are low, thereby resulting in the prevalence of diseases due to lifestyle factors viz. COPD, Cardiovascular Disorders (15.6%), Diabetes (11.1%), etc., It was evident from the study results where COPD was followed by Hypertension and Diabetes. Not only this it was seen that few study subjects who were suffering from more than one disease/disorder, since advancing age act as a catalyst in the development of various ailments like cardiovascular disorders, DM, Liver disorders, etc. there are chances that with the exposure to the risk factor and with advancing age the chances of an individual to get complications increases, for example with prolonged exposure to smoke lead to the development of pulmonary disorder like COPD, Cardiovascular disorders like Hypertension, Angina, MI, IHD, etc. whereas prolonged exposure to alcohol may also lead to various disorders like cardiovascular, hepatic which include Alcoholic Liver disease, liver cirrhosis, chronic liver disease, etc.. There was fewer study population found suffering from the disease/disorder which is affected by lifestyle to some extent. These findings and the interaction with patients and their caretakers also revealed that they were mostly unaware of the importance of lifestyle factors and the role of agents like smoking and alcohol in the development of various disorders.

Treatment Assessment in the Study Population

The pattern of drug use reflects the clinical judgment of the clinicians. Our study found that 3 rd generation cephalosporins (31.1%) were the most widely used agents in this study population. The clinical justification for this prescription pattern was to prevent nosocomial infections prophylactically. The next most prescribed therapeutic group is NSAIDs (12.2%). The use of NSAIDs in the elderly is due to complaints of body pains and cardiovascular disorders. But sometimes NSAIDs cause some bleeding disorders in cardiovascular disorders (dominant in geriatric populations) patients.

The third most prescribed therapeutic group is of the cardiovascular drugs among which anti hypertensive's were Diuretics (10%) followed by ACE inhibitors. The incidence of hypertension in the geriatric population is very high and is a significant determinant of cardiovascular risk in the group. The tendency of blood pressure to increase with age may depend on environmental factors such as diet, stress, and inactivity[6]. Another widely used drug amongst the study population is followed by Corticosteroids which are the main stay of treatment in treating COPD.

Amongst the hypoglycaemic therapy, it was found that Insulin was most widely used followed by Biguanides and sulfonylureas. The other agents used in treating various other infections and disorders were antivirals, Narcotic Analgesics, PPIs, Adrenergics, etc. Previous studies also showed that antimicrobial drugs and anti-hypertensives were amongst the most widely prescribed drugs in elderly patients.[7,8] Due to the prevailing disease conditions, the subjects were exposed to various classes of drugs for the treatment of the respective disorder. With the use of such a variety of drugs and the old age, chances of drug-related problems also come into the picture due to various physiological and metabolic changes that occur in advanced age as evident from various previous studies.[5,9]

CONCLUSION

The current study concluded with an association between the practice of polypharmacy and drug-related problems mainly ADRs and Drug interactions. The more the polypharmacy more the drug-related problems. It is a well-known fact that advancing age leads to the physiological and functional changes in various body organs which can further act as a catalyst in precipitating various disorders like Diabetes Mellitus, Cardiovascular Disorders like Hypertension, IHD, etc. and pulmonary disorders which were also amongst the most prevailing ailments in the study population. Deviation from standard guidelines i.e. Beer's criteria can be considered as one of the factors responsible for the occurrence of Drug-related Problems as higher doses and prescribing without indication can lead to severe consequences in geriatric patients.[10] Moreover, drug-related problems have been found associated with advancing age, there are several factors related to these problems including the practice of polypharmacy. The current study and many previous studies showed that the complexity of diseases in geriatric patients leads to the practice of polypharmacy thereby exposing the patients to more drugs which leads to a more drug-related problem like ADR, drug interactions. A Clinical Pharmacist intervention can be of immense use in avoiding the probable drug-related problems as a pharmacist can help the patient to understand their drugs and disease in a better way

through the patient counseling services, and also the clinical pharmacist intervention can help the prescriber in selecting a regimen which contains lesser number of drugs to prevent the occurrence of drug-related problems. All these interventions can further lead to an important tool in achieving better patient care especially in the geriatric population which requires extra pharmaceutical care due to natural factors. Therefore, the clinical pharmacist intervention should be promoted in geriatric care to achieve a better quality of life in geriatrics.

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