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A PRESCRIBING PATTERN OF DRUGS IN GERIATRICS USING BEERS CRITERIA AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Polypharmacy and inappropriate prescriptions are prominent prescribing issues with elderly patients. Beer's criteria and other guidelines have been developed to assist in the reduction of potentially inappropriate medications prescribed to elderly patients. **Objective:** The objectives of the study are to evaluate the prescription pattern in geriatrics and to identify potentially inappropriate medications using Beers Criteria 2017 **Methodology**: This is a prospective observational study conducted in a tertiary care Hospital, Bangalore from March'18 to May'18. About 200 prescriptions were reviewed and relevant informations were recorded in a structured proforma and data was analysed. **Result**: Most of the cases were from Cardiovascular System (28%), Orthopedics (24%), Endocrine system (11.5%) and chronic obstructive pulmonary disease (12%).According to Beer's criteria 19 drugs were prescribed inappropriately and all those drugs were to be generally avoided in older adults. **Conclusion**: This study had described the prevalence of diseases among geriatric populations and its prescription pattern along with the prevalence of polypharmacy which is usually to be avoided in geriatric populations.

KEYWORDS: Geriatrics, Beer's criteria, inappropriate prescribing.

INTRODUCTION

Geriatrics represents the most vulnerable section of our society and tends to be the largest consumers of prescribed drugs. It is predicted that the population of geriatrics in our country will rise from 8.3% - 10.7% by 2021. It is commonly observed that geriatrics suffer from multiple co-morbid conditions, in this scenario, the use of multiple medications encompasses risks and benefits.[1] This health profile weakens and reduces the independence of the elderly population, generating a continuous and growing demand for multidisciplinary health care teams, hospitalizations, use of medications and even institutionalization.[2] The use of a medication is generally considered appropriate if the expected benefits of the medication outweigh the potential risks.[3] Inappropriate prescribing is associated with negative outcomes including adverse drug events, readmission rates, higher mortality rates, medication nonadherence, increased risk of falls, and increased health care costs.[4,5] Potentially Inappropriate Medications (PIM) now form an integral part of policy and practice and are incorporated into several quality measures.[6,7] For this reason, the appropriateness of drugs prescription and use are important indicators for assessing the quality of health for the elderly. The overall aim of this study was therefore to determine the health conditions and drug utilization patterns in the studied population, the prevalence of PIM use and associated factors.[8]

AIM

The aim of this study was to determine the prevalence of Potentially Inappropriate Medication (PIM) use

OBJECTIVES

- To evaluate the prescription pattern in geriatrics.
- To identify Potentially Inappropriate Medications using Beers Criteria 2017.

METHODOLOGY

Study Site: The study entitled ―Assessment of Prescribing Pattern in Geriatrics Using Beers Criteria at a tertiary care Hospital was carried out in a 250- bedded multi-specialty hospital, Bangalore. The hospital is unique and well known for its services to people who come from various parts of the country.

Departments Selected For Study in the Hospital

- General Medicine
- Cardiology
- Neurology
- Nephrology
- Orthopedics
- Gastroenterology.

The Department of Pharmacy Practice provides services to all departments and a good co-operation from medical

team added up to the reason for selecting those departments for conducting the study. Knowledge on the prescribing pattern in geriatrics will help the health care professionals to ensure the proper treatment outcomes.
Study Design: Prospective observational Study
Study Period: 3 months (March 2018 – May 2018)

Inclusion Criteria
- Patients of either sex getting admitted to the study site during the study period.
- Patients above 65 years.

Exclusion Criteria
- Pregnant and lactating women.
- ICU patients and terminally ill.
- Patients below 65 years.

Data Collection
Ward Round Participation: Daily regular ward rounds were carried out in the study site during the study period and data were collected and recorded in a specially designed data entry format.

Data Analysis: The obtained data during the ward rounds were thoroughly analysed to evaluate inappropriateness in geriatrics using Beers criteria 2017. Data analysed also included the results on patient's demographics [age, gender, length of stay etc.].

RESULTS AND DISCUSSION
During the study period 200 prescriptions were screened randomly. Age distribution of the patients were analyzed and it was found that 65.5 % of the prescription were in the age group of 61-70 years, followed by 27.5% in the age group 71-80 years, 6.5% in 81-90 years and 0.5% in the age group more than 90 years.

Table 1: Age Distribution (N=200).

Age	No.of Prescription	Percentage (%)
61 – 70	131	65.5
71 – 80	55	27.5
81 – 90	13	6.5
> 90 years	01	0.5

The current study revealed that the maximum number of hospital admissions were in the age group of 61 - 70 years. The study showed a male predominance (59%) and female patients (41%).

Table 2: Sex Distribution (N = 200).

Gender	No.of Prescriptions	Percentage
Male	118	59
Female	82	41

Among the patients admitted in the hospital, the percentages of men were more when compared to female patients. It was found that 52% of patients stayed for a period of 1- 5 days, 39.5% of patients stayed for a period of 6-10 days, 5% of patients stayed for a period of 11-15 days and 3.5 % patients stayed for a period of 16-20 days.

Table 3: Length of stay in Hospital (N = 200).

Length of Stay	No.of Patients	Percentage (%)
1 – 5	104	52
6 – 10	79	39.5
11 – 15	10	5
16 – 20	07	3.5

Major diagnosis includes Cardiovascular Disorder (28%), Musculoskeletal Disorders (24%), Endocrine Disorder (11.5%), chronic obstructive pulmonary disease (12%), and others as shown in the table below.

Table 4: Major Diagnosis Observed in the Study (N = 200).

Diagnosis	No.of Patients	Percentage (%)
Musculoskeletal Disorders	48	24
Respiratory Disorder	06	03
Cardiovascular Disorder	56	28
Gastrointestinal Disorder	13	6.5
Endocrine Disorder	23	11.5
Blood Disorder	01	0.5

Renal Disorder	16	8
Neurological Disorder	16	8
Miscellaneous Disorders	21	10.5

The drugs prescribed in each prescription was evaluated and it was found that 14 % of the prescription had 1- 5 drugs, 54 % had 6-10 drugs, 54 % of the prescriptions had 11-15 drugs and 3% of the prescription had 16-20 drugs.

Table 5: No. of medications per prescriptions (N = 200).

No.of Drugs	Frequency of Occurrence	Percentage (%)
1 – 5	28	14
6 – 10	108	54
11 – 15	58	29
16 – 20	06	03

Poly pharmacy was also observed in some of the prescriptions that were prescribed to the patients. The major categories of drugs in the prescriptions were drugs acting on cardio vascular system (19.62 %), Minerals, Calcium And Vitamins (9.89 %), Hypoglycemics (9.23%) gastro intestinal system (9.13%) and others. The appropriateness of these drugs was evaluated using Beer‘s Criteria 2017.

Table 6: Categories of Drugs Prescribed (N = 200).

Category of Drugs	No.of Drugs	Percentage
Antibiotics	96	5.25
Drugs Acting on GI System	167	9.13
Analgesics And Antipyretics	158	8.63
Minerals, Calcium And Vitamins	181	9.89
Drugs Acting on CVS	359	19.62
Drugs Acting on CNS	80	4.37
Hypoglycemics	169	9.23
Drugs Acting on Respiratory System	88	4.81
Anti-Hyperlipidemics	44	2.40
Blood Thinners	135	7.38
Others	353	19.29

Out of 200 prescriptions 90.5 % of the prescriptions were appropriate and 9.5 % were inappropriate.

Table 7: Evaluation of Prescription Using Beers Criteria 2017 (N = 200).

Category of Prescription Screened	No. of Prescription	Percentage (%)
Inappropriate Prescription	19	9.5
Appropriate Prescription	181	90.5

The prescriptions were thoroughly screened using Beers Criteria 2017 and the results indicate that 9.5% of prescriptions were inappropriate. The following drugs were identified in prescriptions based on Beers Criteria 2017 and presented in the table below.

Table 8: Errors Identified In Prescriptions.

S. No.	Drugs under Beers criteria	Frequency of occurrence (%)	Recommendations	Alternatives
1.	Nitrofurantoin	15 (65.2)	Potential for pulmonary toxicity, hepatotoxicity, and peripheral neuropathy, especially with long-term use	Ciprofloxacin Trimethoprim trimethoprim/sulfamethoxazole
2.	Zolepidem	6 (26.1)	Have similar adverse effects as those of benzodiazepines in older adults (e.g., delirium, falls,	Trazodone Temazepam

			fractures); minimal improvement in sleep latency and duration.	
3.	Digoxin (>0.125 mg/day) (LANOXIN)	2 (8.7)	Decreased renal clearance may lead to increased risk of toxic effects	Flecainide Propafenone Dofetilide

Who Prescribing Indicators

The prescribing indicator values obtained were shown in Table 9.

Total number of drugs: 1817

Percentage of medicines prescribed by generic names

A total of 96 (5.28%) of the drugs were prescribed in their generic names.

Percentage of encounters with an antibiotic prescribed

73 (36.5%) prescriptions had one or more antibiotics prescribed.

Percentage of encounters with an injection prescribed

A total of 51 (25.5%) of the prescriptions had at least one injection prescribed along with other drugs.

Percentage of drugs prescribed from the WHO Essential Drug List

About 601(33.08) % of the medicines were prescribed according to WHO essential drug list.

Table 9: Distribution of drugs based on WHO prescription indicators

Indicator	Total	Percentage
No.of drugs per encounter	1817	
Drugs prescribed by generic name	96	5.28
Encounters with antibiotic	73	36.5
Encounters with injection	51	25.5
Drugs from essential drugs list	601	33.08

CONCLUSION

Thus the use of inappropriate medications can be avoided using the Beers criteria 2017, which is one of the important clinical tools which can be wisely used by physicians, pharmacists and health care providers. Beers criteria can be used as a guideline by the physicians while prescribing the drugs to the geriatric population. Before dispensing a medicine to the geriatric patient, the pharmacist should play an important role in assessing the appropriateness of the prescription so that the quality and efficacy of medical care given to geriatrics can be increased. More studies are required on the pattern of inappropriate prescribing over a long period of time and on intervention programs to reduce potentially adverse health outcomes in elderly patients most at risk in the area where this study was undertaken.

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