



Prescribing Pattern in Geriatrics with Cardio Vascular Diseases using Beers Criteria

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Authors' contributions

This work was carried out in collaboration among all authors. Authors EPK and LR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors VS, PRR, BJ, NS and KS managed the analyses of the study. Author MPK managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aim: Cardiovascular disease (CVD) is a major health problem throughout the world and a common cause of premature morbidity and mortality. CVD is a general category of diseases that affects the heart and the circulatory system. The main aim of the study is to assess the prescribing pattern in geriatrics with cardiovascular diseases using beers criteria.

Study Design: Prospective observational study.

Results and Discussion: Total 132 patients, 12 dropouts due to lack of information. Out of 120 patients 69 Patients are identified as Male Patients and 51 Patients are Female. In 120 sample size Maximum No of Cases were found with Ischemic Heart disease (30.8%) Followed by myocardial infarction (24%) coronary artery disease (20%) congestive heart failure (13.3%) Unstable Angina (11.6%). In 120 Sample Size, Male Patients are Suffering More with Complications Compared to Female Patients.

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Conclusion: In this Study with Assessing the Prescribing Pattern in Geriatrics with Cardio Vascular Diseases It was found that major complications seen in Male and Female Patients are Ischemic heart Disease with Left ventricular dysfunction Myocardial Infarction, Coronary Artery Disease, Angina, Congestive Cardiac Failure.

Keywords: Beers criteria; cardiovascular disease; geriatrics; prescribing pattern.

1. INTRODUCTION

Globally, the geriatric population is increasing in number with faster rate than any other age group, as a result of increased life expectancy and decreased fertility. The increase in number of elderly population has also increased more hospital admissions, longer duration of hospital stays and more extended medical treatment. Increase of worldwide burden of oldness associated chronic conditions such as heart disease, neurological disease, emphasis health care providers' to use their scientific knowledge and promote appropriate use of medicines to protect elderly patient from adverse effects of inappropriate medications. Appropriateness in healthcare has been defined as "the outcomes of process of decision making that maximizes net health gains within society's available resources". Appropriate prescribing also associated with reduction of over-use, under- use and misuse of treatment [1-3].

The assessment of geriatric pharmacotherapy intends to modify the existing geriatric care practice. In this context of medicine, the prescribing of medications is an elementary component of elderly health-care, and the optimization of medication prescription has become an important public health concern. There are different explicit criteria for the assessment of appropriateness of prescription in elderly. Some of them are now modified or merged with other. Currently, five tools are being used to evaluate inappropriate prescription in elderly. The Beer's Criteria 2003, improved prescribing in the elderly tool, health plan employers data and information set and screening tool for older persons prescriptions criteria are explicit approaches, while the Medication Appropriateness Index (MAI) is an implicit approach [4-6]. The main aim of the study is to assess the prescribing pattern in geriatrics with cardio vascular diseases using beers criteria.

2. METHODOLOGY

2.1 Study Site

Prospective observational study.

2.2 Study Type

Total 132 patients, 12 dropouts due to lack of information. The study comprised of 120 Geriatric patients, among them 69 were males and 51 females. The present study was carried out for a period of six months from NOV-2019 to MAY – 2020. The present study was conducted at Government General Hospital Ananthapuramu.

2.3 Study Duration

Six (6) months.

2.4 Study Procedure

Data would be collected from case history forms of the patients included in the study and data were analyzed by descriptive statistics using graph pad prism (bio statistical software).

3. RESULTS

Total 132 patients, 12 dropouts due to lack of information. A total of 120 patients were screened for assessing the prescribing pattern in geriatrics with CVD. It indicates the gender wise distribution of the participants. Among the 120 research subjects known male CVD patients are 69 (57.5%) and female CVD patients constitutes of the 51(42.5%). This study revealed that majority of the patients who got admitted in the hospital were in the age group between 61-70years (59%) followed by patients who were in the age group 71-80 years (27%) and the least comes under the range of above 81 years of age (13%). In age group 61-70 years, the incidence of CVD was found more in male patients (64.7%) than females (35.2%), in the age group 71-80 years and above 81 years more number of females (51.5%),(56.2%) were found compared to males (48.4%),(51.5%) respectively. The elderly population suffers from numerous CVDs, in this study, maximum number of cases were found with ischemic heart disease (30.8%) followed by myocardial infarction (24.1%),coronary artery disease (20%), congestive heart failure (13.3%) and Unstable

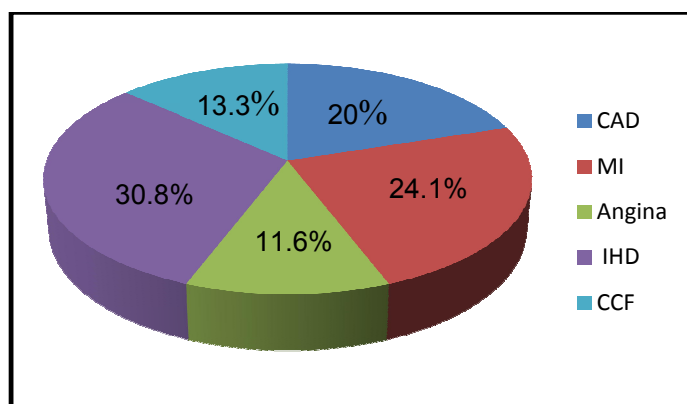


Fig. 1 Chronic CVD conditions

Table 1 Number of drugs prescribed

S. no	Drugs prescribed	Total no. of drugs	percentage
1.	Aspirin	105	87.5%
2.	Clopidogrel	89	74.1%
3.	Atorvastatin	112	93.3%
4.	Pantoprozole	86	71.6%
5.	Heparin	43	35.8%
6.	Isosorbide Dinitrite	55	45.8%
7.	Nitro Glycerine	30	25%
8.	Metoprolol	24	20%
9.	Losartan	08	6.6%
10.	Furosemide	46	38.3%
11.	Salbutamol	12	10%
12.	Dobutamine	02	1.6%
13.	Digoxin	23	19.1%
14.	Enalapril	12	10%
15.	Metformin	04	3.3%
16.	Glimiperide	03	2.5%
17.	Amiodarone	05	1.6%

angina (11.6%) shown in Fig. 1. Commonly prescribed class of drugs in the present study was shown in Table 1.

Total 132 patients, 12 dropouts due to lack of information. A total of 120 prescriptions screened, 92 were prescribed appropriately and 28 were inappropriate. This was evaluated by using AGS Beer's criteria, which is very frequently used method for evaluating appropriateness of prescribing in geriatrics. According to Beer's criteria, present study results revealed that 23.3% of total drugs prescribed were inappropriately.

4. DISCUSSION

This study shows that prevalence of cardio vascular diseases is more in males than females; the majority age group is 61-70 years followed by

71-80 years and above 81 years [7]. The elderly population suffers from numerous CVDs, in this study, maximum no of cases was found with IHD followed by MI, CAD, CHF and unstable angina [8]. This study had shown the patterns of CVD'S prevalent in geriatric patients, drug use among them and also suggests that drugs to be avoided in elderly are among the most frequent inappropriately prescribed drugs. Inappropriate prescription may lead to the occurrence of ADRs in geriatrics that cause mortality and morbidity [9-10] Beer's criteria is one of the powerful tool to access the use of potentially inappropriate medication in geriatrics. The Beer's criteria are based on expert consensus developed through an extensive literature review with a bibliography and questionnaire. It is evaluated by nationally recognized experts in geriatric care, clinical pharmacology, and psychopharmacology using a

modified Delphi technique. It is explicit in nature, being derived from published reviews, expert opinions and consensus techniques without clinical judgement about the presenting patient. Beer's et al, published this criteria in the United States in 1991 to determine potentially inappropriate prescribing of medication in elderly [11-13].

According to this, drugs were classified as inappropriate in three categories:

- 1) Drugs that generally should be avoided in older adults;
- 2) Drugs that exceed a maximum recommended daily dose; and
- 3) Drugs to be avoided in combination with specific co morbidity [14].

Beer's Criteria were updated in 2003, again validated by a consensus technique. The revised version (2003) listed 48 medicines or drug classes that should generally be avoided in elderly patients. Medications added in revised version of general list of inappropriate medications were Nitrofurantoin, Doxazosin and Amiodarone. Fifteen medications and medication classes were removed from the 1997 list, e.g. the use of beta-blockers (with exception of Propranolol) in those with COPD, asthma, peripheral vascular disease and syncope or falls. However, the updated criteria do not identify all important causes of potentially inappropriate prescribing (e.g. drug interactions are not included).

Using Beer's Criteria, rates of inappropriate prescribing range from 7.9 to 50% among elderly patients of different countries by 2003. The most commonly identified inappropriate drugs in these studies were long-acting Benzodiazepines, Dipyridamole, Propoxyphene and Amitriptyline.

In year 2011, the modification and update of criteria was accomplished by American Geriatric Society (AGS) along with multidisciplinary panel of experts in geriatric medicine, nursing, and pharmacotherapy to develop 2012 AGS Beer's criteria. Three categories are included.

- The first category includes medications that are potentially inappropriate for older people because they either pose high risks of adverse effects or appear to have limited effectiveness in older patients, and because there are alternatives to these medications.

- The second category includes medications that are potentially inappropriate for older people who have certain diseases or disorders because these drugs may exacerbate the specified health problems [15-17].
- The third category includes medications to be used with caution in older adults. While these medications may be associated with more risks than benefits in general, they may be the best choice for a particular individual if administered with caution. Addition of third category is important because it highlights that medications need to be personalized to the unique needs of each patient [18-22].

Using AGS Beer's criteria 2012, the study has shown increased prevalence of inappropriate drug use (58.4%) as compared to previous criteria. Inclusion of more drugs and third category could be possible explanation for this. Other research group has demonstrated immense difference in prevalence rate according to 2003 (28.57%) and 2012 (40%) criteria.

4.1 Limitations of the Study

- Limited Sample Size
- Some Older Patients Did Not Respond to the Survey Considered as non-responders
- There is a lack of serial Observation due to Limited study period
- Regular check up by Cardiac patients and periodic monitoring of Patients Progression by Physicians is necessary to avoid Complications of Cardiac Diseases.
- Special care and education is needed to control the Congenital Heart Defects in Cardiovascular Diseases → patient Counselling is Necessary to Avoid Complications.
- It is the Responsibility of all health care professionals to educate the patients regarding life style modification which improve the community health status.

5. CONCLUSION

Inappropriate prescription may lead to the occurrence of ADRs in geriatrics that cause mortality and morbidity. Hence it is necessary to avoid the use of inappropriate medication in geriatrics to reduce adverse effects of drugs and further larger studies involving elderly patients in various departments are necessary to realise the impact of this serious problem and to make

prescriptions more rational in this group of population.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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