



## A STUDY TO ASSESS THE PRESCRIBING PATTERN FOR GERIATRIC PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL

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### ABSTRACT

The aim of this study is to assess the prescribing pattern for geriatric patients in tertiary care teaching hospital. This is a prospective observational study conducted for a period of 6 months by obtaining ethical clearance from the institutional ethical committee of Togari Veeramallappa Memorial College of pharmacy. The data collected from 200 enrolled subjects with the help of medical records. Out of 200 patients male were n=110 (55%), and female were n= 90 (45%). Prevalence of patients were high in age group of 65-69 years n=101 (50.50%) nearly, 90 patients were complaining of Breathlessness (24.06%) followed by fever (17.37%) and cough (13.36%). The results revealed most of the diseases were related to cardiovascular system n= 86 (26%) followed by respiratory system (18%) and others (14.32%). Most commonly prescribed class of drugs were Antibiotics n=116 (22.28%) followed by Gastro intestinal drugs n=103 (18.85%) and Cardio vascular drugs n=93 (17.05%). Nearly 176 patients (88%) were prescribed with more than 5 drugs. Based on the questionnaire all the patients were following the medication as prescribed by the doctor (100%), most of the patients were not practicing any physical exercises/yoga/meditation (86%), majority of the patients were not feeling any stress (60.50%) and were having regular sleep (72.50%) . The study revealed that most of the prescriptions were rational but further improvement is needed. Further study focused on rationale of drugs based on demographic data, chief complaints along with polypharmacy, physical behavior of the patients.

**Key Words:** -Polypharmacy, Geriatric, Questionnaire, Demographic data.

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### INTRODUCTION

India is one of the countries with major geriatric population, generally in India once they become aged,

they feel dejected and insecure. The cut off age to be called geriatric is 65 years and above. The elderly have Multiple and often chronic diseases. It is not surprising, therefore, that they are the major consumers of drugs. Elderly people receive about one-third of National Health Service (NHS) prescriptions in the UK. In most developed countries, the elderly now account for 25–40% of drug expenditure. Geriatrics medicine is the branch of gerontology, generally in India once they become aged, they feel dejected and insecure. The cut off age to be called geriatric is 65 years and above. The changes that occur with ageing are – changes in GI absorption, absorption from the skin is reduced, and shrinkage of liver, hepatic blood flow is reduced. Also body fat increases in proportion to water and muscles, fat soluble drugs undergo slower elimination. Renal function is impaired, glomerular filtration is reduced. As elderly patients are more likely to suffer from different chronic illness that requires multiple drug therapies. There are

age related physiological changes in elderly population which lead to change in pharmacokinetic and Pharmacodynamics of the drugs. Careful and rational prescribing is essential for optimum drug therapy for older patients (Muhammad Asaduzzaman *et al.*, 2011).

Ageing results in many physiological changes that could theoretically affect absorption first pass metabolism, protein binding, distribution and elimination of drugs. Age-related changes in the gastro intestinal tract, liver and kidneys are:

- Reduced gastric acid secretion.
- Decreased gastrointestinal motility.
- Reduced total surface area of absorption.
- Reduced splanchnic blood flow.
- Reduced liver size.
- Reduced liver blood flow.
- Reduced glomerular filtration.
- Reduced renal tubular filtration.

The ultimate consequences are increased risk of geriatric syndromes, diminished functional status, longer hospital stay and healthcare cost. Institutionalized patients tend to be on larger numbers of drugs compared with patients in the community. One study has shown that patients in long-term care facilities are likely to be receiving, on average, eight drugs. Psychotropic drugs are used widely in nursing or residential homes. For optimal drug therapy in the elderly, knowledge of age-related physiological and pathological changes that might affect handling of and response to drugs is essential. This chapter discusses the age-related pharmacokinetic and pharmacodynamics changes which might affect drug therapy and the general principles of drug use in the elderly. Pharmacodynamics Molecular and cellular changes that occur with ageing may alter the response to drugs in the elderly. There is however, limited information about these alterations because of the technical difficulties and ethical problems involved in measuring them. It is not surprising, therefore, that there is relatively little information about the effect of age on pharmacodynamics. Changes in pharmacodynamics in the elderly may be considered under two headings:

- Those due to a reduction in homeostatic reserve and
- Those are secondary to changes in specific receptor and target sites.

There are lot of factors that affects the choice of medicines in elderly. They are more sensitive to the effects of drugs and are at risk of drug related problems. The biggest problem faced by health care professionals is that lack of literature regarding the use of medications in this age group. Majority of population suffer from multiple disease states and consume many medications together on regular basis. The various issues faced in the medication management of the elderly population are poly pharmacy and poor patient compliance. This may lead to the occurrence of synergistic effect that may lead to toxicity or antagonism that leads to reduced

effectiveness of the prescribed drugs. The next major problem is inadequate monitoring in which the patient is prescribed with the right drug but is not properly checked for complications or effectiveness or both. Sometimes choosing the right drug for patient is the matter that needs to be considered. Sometimes drugs are prescribed without any proper indications. Prescribing too many medicines to the elderly leads to lack of medication adherence and results in effective treatment. Sometimes certain medical problems are not properly identified because of improper communication and understanding among health care professionals. The altered physiology during aging and existence of multiple diseased states make this population vulnerable to understand prescribing patterns (Roger Walker and Cate whittlesea., 2012).

Because of this reason the health care providers need to improve the health care outcomes in this population by providing a balance between medically necessary and safe medicines. It is therefore necessary for the health care team to look into issues of poly pharmacy, eliminate barriers to medication adherence and restrict prescribing medications to medications that pose least risk to the elderly population (Veena DR *et al.*, 2012)

## MATERIALS AND METHODS

A Prospective observational study conducted in a period of six months by considering the inclusion and exclusion criteria. The data collected from general medical wards [male and female] of VIMS, Ballari. A total of 200 patients are enrolled in this study. Ethical approval was obtained from the institutional ethics committee of the TVM College of pharmacy, Ballari. Patients who were 65 and above age (Male and female), patients with or without co morbidities, patients who are willing to participate in this study and signed in the consent form were included. Patients who were unable to communicate, patients who were severely ill i.e., Emergency visits were excluded from the study. The data was collected from the inpatient case medical records. The collected data was analyzed using Microsoft excel 2007 (Jyothi Upadhyay *et al.*, 2011).

## RESULT AND DISCUSSION

A total no. of 200 patients had been participated during the study period.

### AGE AND GENDER

The data was collected from 200 in-patients using specially designed data collection form. Out of which 110 (55%) were males and 90 (45%) were female patients similar to the Goudanavar P *et al* study conducted at Raichur, Karnataka reported that the male patients n=220(55%) and female patients n=180(45%). The study revealed that majority of the patients who got admitted in the hospital were in the age group between 65-69 years

(50.50%) followed by patients who were in the age group 70-74years (21%) and the least comes under the range of above 90 years of age (1%). This can be attributed to the fact that more patients who visited the hospital during study period were in the range between 65-69years of age which is similar to the Chitra B et al conducted a study at Coimbatore. In this study age distribution of the patients were analyzed and 42% of the prescriptions were in the age group of 65-69 years, followed by 21% in the age group 70-74 years, 21% in 75-79 years (Mukta N Chowta *et al.*, 2013).

#### DISTRIBUTION OF CHIEF COMPLAINTS

In the present study out of 200 patients the Breathlessness (24.06%), fever (17.37%) and cough (13.36%) were the most common reasons for hospital admission and also found the 100% of following prescription followed by 14% of physical exercise, 72.50% of insomnia, 39.50% of stress in life were reported which is high in following prescription and insomnia when compared to Asaduzzaman M et al conducted study among outdoor geriatric patients at Bangladesh reported the most common complaints of geriatrics patients were Chest pain (14%), joint pain, muscle pain and respiratory distress were found in 34%, 31% and 25% of the patients. Age related stress and insomnia are not common among the geriatric patients. It was found that 41% of the patients suffered from insomnia and 49% had stress in life, 25% of physical

exercise 66% of following prescription (Raut Binod *et al.*, 2017).

#### DISTRIBUTION OF DISEASES

The elderly population suffers from numerous chronic disorders. In this study, maximum of diagnosed cases were from cardiovascular system (26%), followed by respiratory system (18%) which is less compared to the Kumar. M *et al* conducted a study among elderly patients at Tamilnadu reported that maximum of the cases were from Cardiovascular system (39.13%) followed by Endocrine system (25%) (Prakash Goudanavar *et al.*, 2016; Mahesh Kumar VP *et al.*, 2013).

#### DISTRIBUTION OF CLASS OF DRUGS

In present study most commonly prescribed drugs are Antibiotics (22.28%) followed by GI protective agents (18.85%) were our study has prescribed more drugs than the Veena *et al* study among the elderly at Bangalore reported that Antimicrobial drugs (19.96%) followed by GI protective agents (16.57%) were the most commonly prescribed medications for geriatrics (Roger Walker and Cate Whittlesea., 2012).

**POLYPHARMACY:** In present study the prevalence of polypharmacy was 88% which seems to be high compared to Joshi *et al* study in Nepal, where the incidence of polypharmacy in elderly inpatients found to be 73.6%.

**Table 1. Gender Wise Distribution**

| GENDER  | TOTAL NUMBER (n=200) | PERCENTAGE |
|---------|----------------------|------------|
| Males   | 110                  | 55%        |
| Females | 90                   | 45%        |

**Table 2. Age Wise Distribution**

| AGE GROUP IN YEARS | TOTAL NUMBER OF PATIENTS (n=188) | PERCENTAGE |
|--------------------|----------------------------------|------------|
| 65-69              | 101                              | 50.50%     |
| 70-74              | 42                               | 21%        |
| 75-79              | 24                               | 12%        |
| 80-84              | 14                               | 07%        |
| 85-89              | 05                               | 2.50%      |
| 90-94              | 01                               | 0.50%      |
| 95 Above           | 01                               | 0.50%      |

**Table 3. Chief Complaints**

| CHIEF COMPLAINTS     | TOTAL NO(n=365) | PERCENTAGE |
|----------------------|-----------------|------------|
| Breathlessness       | 90              | 24.06%     |
| Fever                | 65              | 17.37%     |
| Cough                | 50              | 13.36%     |
| Vomiting             | 31              | 8.28%      |
| Generalised Weakness | 27              | 7.21%      |
| Chest Pain           | 21              | 5.6%       |
| Abdominal Pain       | 15              | 4.0%       |

|                   |    |       |
|-------------------|----|-------|
| Loose Stools      | 14 | 3.74% |
| Giddiness         | 14 | 3.74% |
| Low Urine Output  | 13 | 3.47% |
| Swelling of Limbs | 13 | 3.47% |
| Loss of Appetite  | 12 | 3.20% |

**Table 4. Categories of Diseases**

| DISORDERS                  | TOTAL NO ( n=328 ) | PERCENTAGE |
|----------------------------|--------------------|------------|
| CARDIOVASCULAR DISORDER    | 86                 | 26%        |
| RESPIRATORY DISORDER       | 59                 | 18%        |
| OTHERS                     | 47                 | 14.32%     |
| RENAL DISORDER             | 46                 | 14.02%     |
| ENDOCRINAL DISORDER        | 42                 | 12.80%     |
| BLOOD DISORDER             | 18                 | 5.48%      |
| INFECTIOUS DISORDER        | 16                 | 4.87%      |
| GASTRO INTESTINAL DISORDER | 14                 | 4.26%      |

**Table 5. Classe of Drugs**

| DRUG CLASS                            | TOTAL No n=545 | PERCENTAGE |
|---------------------------------------|----------------|------------|
| ANTIBIOTICS                           | 116            | 22.28%     |
| DRUGS ACTING ON GI SYSTEM             | 103            | 18.85%     |
| DRUGS ACTING ON CVS                   | 93             | 17.065%    |
| DRUGS ACTING ON RESPIRATORY SYSTEM    | 53             | 9.725%     |
| ANALGESIC AND ANTI-INFLAMMATORY DRUGS | 49             | 8.995%     |
| MINERALS, VITAMINS, CALCIUM           | 39             | 7.15%      |
| OTHERS                                | 37             | 6.78%      |
| DRUGS ACTING ON CNS                   | 33             | 6.005%     |
| HYPOGLYCEMIC AGENTS                   | 22             | 4.03%      |

**Table 6. Polypharmacy**

| CATEGORY | POLYPHARMACY           | TOTAL ( n=200) | PERCENTAGE |
|----------|------------------------|----------------|------------|
| A        | LESS THAN 5 DRUGS      | 24             | 12%        |
| B        | 5 OR MORE THAN 5 DRUGS | 176            | 88%        |

**Table 7. Questionnaire**

| CATEGORY | QUESTIONNAIRE                                               | YES   | NO    | YES    | NO     |
|----------|-------------------------------------------------------------|-------|-------|--------|--------|
| A        | Medications followed by patients as prescribed by physician | n=200 | n=0   | 100%   | 0%     |
| B        | Practice of daily physical exercises/yoga/meditation        | n=28  | n=127 | 14%    | 86%    |
| C        | Is patient on regular sleep?                                | n=145 | n=55  | 72.50% | 27.50% |
| D        | Is patient feeling stress in life?                          | n=79  | n=121 | 39.50% | 60.50% |

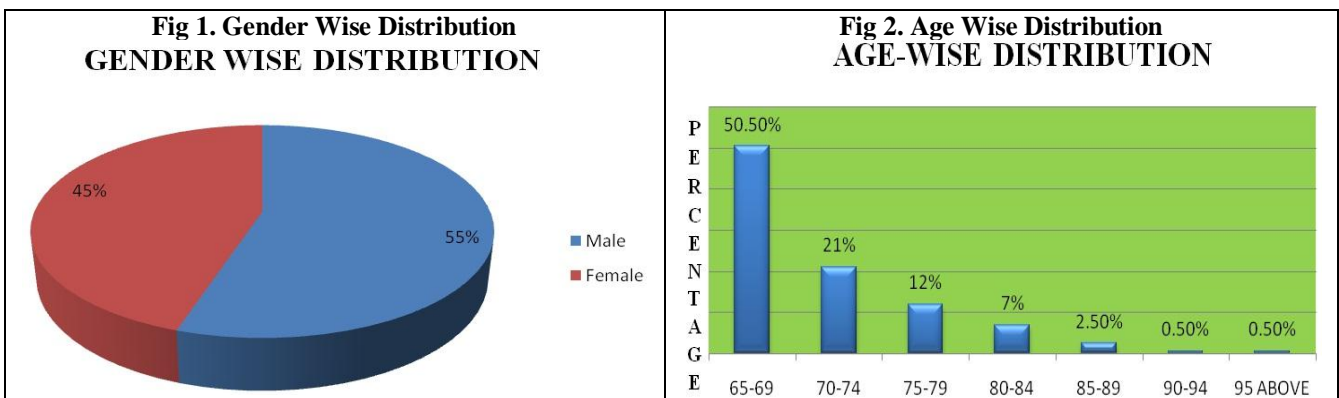


Fig 3. Chief Complaints



Fig 4. Category of Diseases

CATEGORY OF DISEASES

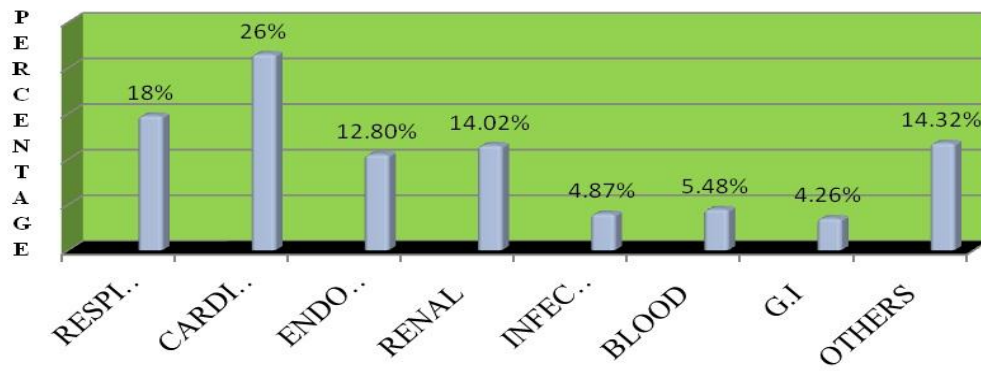


Fig 5. Category of Drug Classes

CATEGORY OF DRUG CLASSES

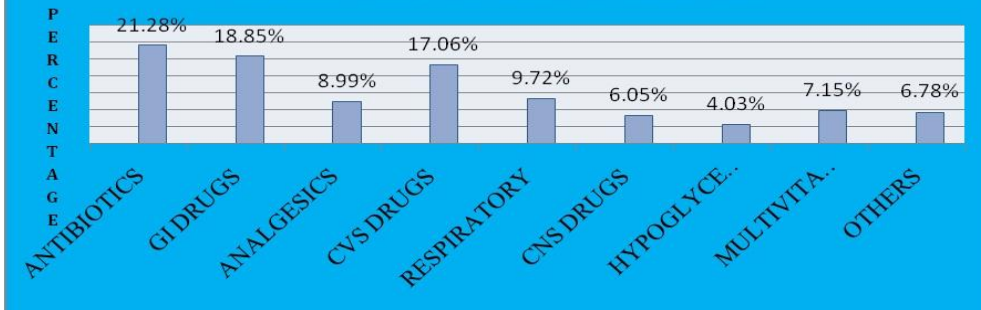


Fig 6. Polypharmacy

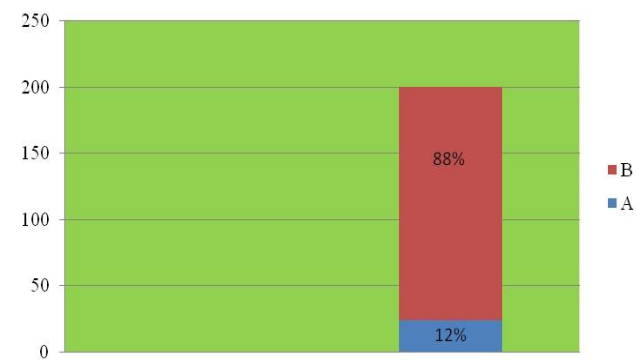
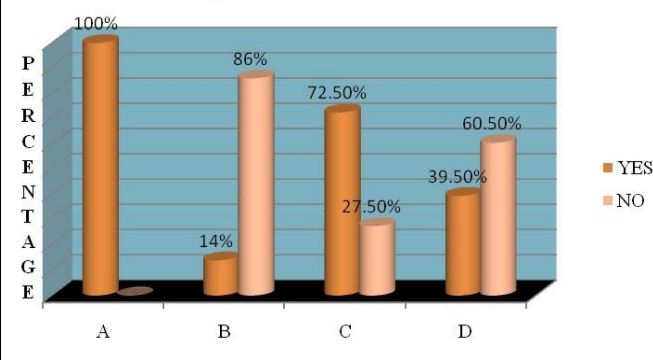


Fig 7. Questionnaire



## CONCLUSION

Prescription of medicines is a fundamental component of care for elderly people. The present prospective study was carried out to assess the prescribing pattern for geriatric patients in a tertiary care teaching hospital, vijaya nagara institute of medical sciences; Bellary. This study has shown the pattern of diseases prevalent in geriatric patients, drug use among them and also suggests that drugs to be avoided in elderly are among the most frequent. Prevalence of polypharmacy was high and is usually unavoidable in the elderly and most of the prescriptions were rational but further improvement is needed. The high prevalence of polypharmacy should be addressed properly and measures should be taken to improve the prescribing behavior of the physicians by raising awareness among the prescribers. This indicates that there is a need for multidisciplinary, multifaceted and multi sector approach which may improve drug safety and adherence in the elderly (Chitra B *et al.*, 2015).

Our study could be the subject of study for physician and pharmacist for determining the safety and efficacy of the drugs. Our study also concludes the average number of drugs per prescription is an important index of the scope for review and intervention in prescribing practices. It is preferable to keep the mean number of drugs per prescription as minimum as possible. This will help to avoid the drug-drug interactions, development of bacterial resistance and will reduce hospital cost. Physical behaviour of patients can be improved by direct interview which will help them to be more adhered to the treatment plan and improvement in clinical status can also be achieved. By questionnaire it was assessed that patients were mostly following the

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physicians order but there is still need for improvement in quality of life (Nachiket Bhavershaikh *et al.*, 2015; Sultan H *et al.*, 2015; Osemeke NP *et al.*, 2017).

## Strengths

1. This study creates an awareness regarding medication adherence for patients and physicians.
2. The study data can be further utilized as a reference in Ad-hoc studies of similar types.
3. Questionnaire that are used in the study was an effective to which can helps us to know the impact of behavioural pattern in clinical status of the geriatric patients.

## Limitations

1. The limited sample size was one of the major limitations due to short duration of the study.
2. Some of the respondents might have not disclosed the truth.
3. Recall bias can possibly affected the findings of the study.
4. Limitation of the study includes restriction to one specialty. It also emphasizes the need for creating more awareness among the general practitioners & clinicians, on this important public health issue by conducting more continued medical education programs on drug therapy in elderly.

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