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Original Research Article

Drug utilization study in geriatric patients visiting medicine OPD in tertiary care hospital

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ABSTRACT

Background: Drug utilization study is of utmost importance in the elderly. The consumption of drug amongst elderly segment of society is maximum and many of them use at least three prescribed drugs, concurrently. One of the plausible explanation of usage of large number of medicines is prevalence of multi-morbidities as well as suffer from chronic and degenerative pathology amongst them along with the alteration of pharmacokinetics and pharmacodynamics of many drugs are altered with advanced age. Thus, the aim of this study was to assess current prescribing practices among physicians for geriatric patients in tertiary care hospital.

Methods: A prospective, observational and cross-sectional study was conducted in Department of Pharmacology in collaboration with Department of Medicine in a tertiary healthcare hospital. As per inclusion criteria, patients visiting Medicine outpatient department (OPD) from 01 October 2018 to 31 December 2018 were enrolled in the study.

Results: The average number of drugs per encounter was 4.1. 100% of the drugs were prescribed by their generic name and those prescribed from World Health Organization (WHO) list of essential medicines were 70.2%. Analysis of polypharmacy showed maximum 11 and minimum 1 drug was prescribed. Overall analysis of the drugs showed, the most common route of administration was orally. Drugs acting on cardiovascular system (CVS), gastrointestinal system (GI) system, analgesics and anti-inflammatory drugs and vitamins and mineral supplements constitute the major bulk of drug prescribed.

Conclusions: In our study, though polypharmacy was found but it was necessary unavoidable, but was within the WHO standards of 1.6 to 4.8. Drugs acting on CVS and GI system were the most common drugs prescribed. Prescriptions with injections and steroids were less in the study population. All the drugs were prescribed by their generic name and most were present in the essential list of medicines.

Keywords: CVS, GI system, Medicine, Drug utilization study, Geriatric

INTRODUCTION

Drug utilization study is of utmost importance in the elderly. According to WHO, drug utilization research was defined as the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences.^{1,2} The consumption of drug amongst elderly segment of society is maximum and many of them use at least three prescribed drugs, concurrently.³⁻⁵ One of the plausible

explanation of usage of large number of medicines is prevalence of multi-morbidities as well as suffer from chronic and degenerative pathology amongst them along with the alteration of pharmacokinetics and pharmacodynamics of many drugs are altered with advanced age.^{6,7} Previous studies have revealed that because of exclusion of frail elderly from clinical trials, the knowledge about the efficacy and safety of many drugs is often sparse.^{6,7} It is evident from epidemiological studies that the elderly population is increasing rapidly still rational prescribing of medicines in elderly continues to

present a major challenge.⁸ Inappropriate prescribing or use trends are common in elderly and to prevent this many guidelines and criteria like Beer's criteria have been used but still there is a need of improvement in this field.⁹

The most crucial phase of pharmacotherapy of any disease is its appropriate diagnosis followed by rational prescribing of drugs. Irrational polypharmacy accounts for 28% of adverse drug reactions and also stimulate inappropriate patient demand leading to reduced access and attendance rates due to medicine stock outs and loss of patient confidence in health.¹⁰ It has been estimated that 50% or more medicine expenditure is being wasted through irrational prescribing, dispensing and patient use of medicine.¹¹

World Health Organization (WHO) convened a conference on "rational drug use" in Nairobi in 1985 defined rational drug use as follows: the rational use of drug requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period and at the lowest cost to them and their community.¹² Along with this, competent and qualified pharmacist should be trained for dispensing and for giving proper instruction to the patients on safe and effective usage of drugs.¹³

Rational medication prescribing dictates that the fewest medications be used achieve the therapeutic goals as determined by clinician and patients. Multiple medications not only add to the cost and complexity of therapeutic regimens, but also play patients at greater risk for adverse drug reactions and drug-drug interactions.¹⁴

Prescription pattern studies will identify problems before a drug is dispensed and will greatly improve patient care.¹⁵

Hence, the current study will evaluate the prescription pattern of geriatric medications and recent trends in geriatric polypharmacy at a tertiary health care centre.

The aim of the study was to assess and evaluate current prescribing pattern for geriatric patients visiting medicine OPD in tertiary care hospital.

The objectives were to analyze the demographic pattern of geriatric patients visiting medicine OPD, to analyse the distribution of drugs prescribed according to group of drugs, to evaluate the occurrence of polypharmacy, to analyse the distribution of drugs according to dosage forms and to calculate the percentage of drugs following guidelines of WHO prescription indicators.

METHODS

This prospective and observational study was carried out in department of pharmacology in collaboration with department of medicine of a tertiary healthcare teaching institute in Maharashtra.

Study design

It was a hospital based prospective, cross-sectional and observational study.

Study period

The study was conducted over a period of 3 months from 01 October 2018 to 31 December 2018 at Shri Chhatrapati Shivaji Maharaj Sarvopchar Rughalay, Solapur, Maharashtra.

Sampling

A total of 360 prescriptions were selected.

Inclusion criteria

All patients of either sex and above the age of 60 years visiting medicine OPD.

Exclusion criteria

Patients below the age of 60 years, those unwilling to participate in the study and all IPD patients.

Methodology

The sampling frame was fixed as ten prescriptions/day, three days/week during the study period. In case of OPD holidays or non-fulfilment of target of ten prescriptions/day, the prescriptions of that day was done on next working day. Daily sampling must have at least one prescription of both genders. Patients' prescription records was used to collect data on most recent prescribed medication.

The following data was collected and analysed: demographic information i.e. age and sex, diagnosis, drugs categorized into different classes and dosage form, prevalence of polypharmacy, percentages of fixed-dose combinations (FDCs), and percentage of drugs following guidelines of WHO prescription indicators".¹¹

Ethical approval

It was obtaining from the institutional ethics committee. Patients were given prior information.

Statistical analysis

Data was entered into Microsoft Excel, 2013. Descriptive statistics such as frequencies and percentages were calculated for categorical variables.

RESULTS

The present study was an observational study conducted in Department of Medicine of a tertiary care teaching hospital

after obtaining permission from the institutional ethics committee (IEC) and Department of Medicine. In this study, prescription of 360 patients attending the OPD of Department of Medicine over a period of 3 months were assessed.

Distribution of patients according to gender

Out of the total 360, 198 (55%) were males and 162 (45%) were females (Table 1).

Table 1: Distribution according to gender.

| Gender | No. | Percentage |
|--------|-----|------------|
| Male | 198 | 55 |
| Female | 162 | 45 |

Distribution of patients according to age group

In this study, patients were divided into four groups based on different age. Out of 360 patients 69 (19.2%) were from 61-70 years followed by 129 (35.8%) were from 71-80 years, 84 (23.3%) were from 81-90 years and 78 (21.7%) from >91 years respectively (Table 2).

Table 2: Distribution according to age group.

| Age | No. | Percentage |
|-------|-----|------------|
| 61-70 | 69 | 19.2 |
| 71-80 | 129 | 35.8 |
| 81-90 | 84 | 23.3 |
| >91 | 78 | 21.7 |

Distribution of drugs according to group of drugs

Out of the total 360 prescriptions, 24% were drugs acting on CVS, 17% were drugs acting on GI system, 14% were analgesics and anti-inflammatory drugs, 14% were vitamins and mineral supplements, 8% were drugs acting on endocrine system, 8% were drugs acting on respiratory system, 7% were antibiotics, 4% with drugs acting on CNS and 4% with others (Table 3).

Table 3: Distribution of patients according to group of drugs.

| Class | Percentage |
|--|------------|
| Drugs acting on CVS | 24 |
| Drugs acting on GI system | 17 |
| Analgesics and anti-inflammatory drugs | 14 |
| Vitamins and mineral supplements | 14 |
| Drugs acting on endocrine system | 8 |
| Drugs acting on respiratory system | 8 |
| Antibiotics | 7 |
| Drugs acting on CNS | 4 |
| Others | 4 |

Number of drugs prescribed per prescription

Number of drugs per prescription varied from 1 to 11 with average of 4.1 drugs per prescription. Most of them, 65% had 4 to 5 drugs, 14.1% having 2 to 3 drugs (Table 4).

Table 4: Distribution of drugs prescribed per prescription.

| No. of drugs prescribed | No of prescription | Percentage |
|-------------------------|--------------------|------------|
| 1 | 3 | 0.8 |
| 2 | 51 | 14.1 |
| 3 | 66 | 18.3 |
| 4 | 105 | 29.1 |
| 5 | 63 | 17.5 |
| 6 | 39 | 10.8 |
| 7 | 27 | 7.5 |
| 8 | 3 | 0.8 |
| 11 | 3 | 0.8 |

Distribution of drugs according to dosage forms

Out of all the drugs prescribed in 360 prescriptions, 74% were tablets, 18% were capsules, 3.2% were syrups, 2.7% were injectables and 2.1% were creams (Table 5).

Table 5: Distribution drugs according to dosage form.

| Dosage form | No. | Percentage |
|-------------|------|------------|
| Tablets | 1112 | 74 |
| Capsules | 270 | 18 |
| Syrups | 49 | 3.2 |
| Injectables | 40 | 2.7 |
| Creams | 32 | 2.1 |

Table 6: WHO core drug use indicators - prescribing indicators.¹⁵

| WHO core drug use indicators | Number/percentage |
|--|-------------------|
| Average number of drugs per prescription | 4.1 |
| Drugs prescribed by generic name (%) | 100 |
| Encounters with an antibiotic prescribed (%) | 7 |
| Encounters with a steroid prescribed (%) | 0 |
| Encounters with an injection prescribed (%) | 2.7 |
| Prescribed drugs featuring in WHO essential drugs list (%) | 70.2 |
| Drugs prescribed by FDCs (%) | 8.4 |

WHO/INRUD rational drug-use indicators

The drug usage was assessed as per WHO core drug use indicators, prescribing indicators revealed that out of the

total drugs prescribed, 100% were prescribed by generic names and about 70.2% of the drugs were prescribed from the WHO essential drug list. Overall, the average number of drugs per encounter was 4.1. The proportions of encounters with at least one antibiotic prescribed was 7%. Present study shows that total of 8.4% drugs prescribed as fixed drug combination. 0% of the total prescriptions encountered with a steroid prescribed while injections were found to be prescribed in 2.7% encounters. 70.2% drugs prescribed were WHO essential drug list 2017 (Table 6).¹⁶

DISCUSSION

The present study was an observational study conducted in Department of Medicine of a tertiary care teaching hospital after obtaining permission from the institutional ethics committee (IEC) and Department of Medicine. In this study, prescription of 360 patients attending the OPD of Department of Medicine over a period of 3 months were assessed.

In the present study, males, 55% were more than females, 45%, which was similar to studies conducted by both Nishandar et al, males 61% and females 39%, and Jadhav et al, males 61.3% and females 58.7%.^{17,18}

In the present study, more than 63% of the patients belonged to the age group of 61 to 70 years followed by 25% in the age group of 71 to 80 years and 12% in the age group of more than 80 year, which was similar to the study conducted by both Nishandar et al and Goudanavar et al.^{17,19}

The present study findings suggested that drugs acting on CVS was the most common class of drugs prescribed, which was similar to the study conducted by both Nishandar et al and Jadhav et al.^{17,18}

The second most common class of drugs was drugs acting on GI system followed by analgesics and anti-inflammatory drugs, which was similar to study conducted by Jadhav et al but different to that by Nishandar et al, having analgesics and NSAIDs being second most common followed by drugs acting on gastrointestinal system.^{17,18}

The average number of drugs/prescription in current study were 4.1 drugs, which was similar to studies conducted by Nishandar et al (3.4) and Jadhav et al (4.3).^{17,18}

The current study findings suggested that 74% of the drugs were prescribed in the form of tablets, 18% were prescribed in the form of capsules, 3.2% was in the form of syrups, 2.7% was in the form of injectables and 2.1% were in the form of creams.

Under WHO core drug use indicators, in the present study, 100% of the drugs were prescribed by generic names, which was 61.7% in study conducted by Nishandar et al and just 26.4% in the study by Jadhav et al.^{12,17,18} Whereas

only 7% of the encounters had an antibiotic prescribed in present study, compared to 33.5% in study by Nishandar et al and 7.5% by Jadhav et al.^{17,18} Percentage of encounters having at least one steroid prescribed were 0% in the present study. Percentage of encounters having at least one injectable prescribed were 2.7% in present study, was 0.15% in study conducted by Nishandar et al and 3.5% in study conducted by Jadhav et al.^{17,18} Percentage of prescribed drugs featuring in WHO essential drugs list were 70.2% in present study (2017), was 83.2% in study conducted by Nishandar et al (2015) and 86.3% in study by Jadhav et al (2015).^{12,17,18} Percentage of drugs prescribed by FDCs were 8.4% in current study, was 1.1% in study conducted by Nishandar et al and was 13.2% in the study by Jadhav et al.^{17,18}

Limitations

There exists some limitation to our study. The study was conducted in a tertiary care hospital located in urban area which cannot reflect the health care facilities available to all health centres particularly in the rural areas. This research was limited by size and site of the study population, a larger population size could give a better result and more reliable outcomes which could be generalize for the entire community.

CONCLUSION

Increasing prescribing in geriatric has necessitated assessment of their rational usage. In our study, though polypharmacy was found but it was necessary and unavoidable, but was within the WHO standards of 1.6 to 4.8. Drugs acting on CVS, drugs acting on GI system and analgesics and anti-inflammatory drugs were the most common drugs prescribed in our study population and were in line to the common problems faced by the geriatric population. Prescriptions encountered with injections and steroids were less in the study population, this is an encouraging sign and need to be encouraged. All the drugs were prescribed by their generic name and most were present in the essential list of medicines, which is an encouraging sign. Promoting 'WHO rational drug use policy' is recommended for effective healthcare management.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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