

DRUG UTILIZATION STUDY IN GERIATRIC PATIENTS AT RURAL TERTIARY CARE HOSPITAL

ATUL KOLHE*, KALE AS, SUDHIR L PADWAL

Department of Pharmacology, Swami Ramanand Teerth Rural Government Medical College, Ambajogai, Beed, Maharashtra, India.

Email: mallikarjun.kolhe@yahoo.in

Received: 29 March 2015, Revised and Accepted: 05 May 15

ABSTRACT

Objective: The objective was to study the drug utilization pattern in geriatric patients at rural tertiary care hospital.

Methods: This was a cross-sectional observational study involving 600 geriatric outpatients. The study was carried out from May 2014 to July 2014. The data were collected using predesigned proforma specially designed for this purpose. Relevant information was obtained by analyzing the prescriptions for World Health Organization (WHO) core drug indicators.

Results: The total numbers of prescriptions studied were 600. The total number of drugs prescribed is a product of actual drugs and number of patient prescriptions. The majority of the patients were in the age group 65-70 years (69.33%). There was male preponderance (58.66%). Musculoskeletal diseases were the most common (26.33%), followed by cardiovascular diseases (26%). The average number of drugs per prescription was 2.79. Out of total number of drugs prescribed, 380 drugs (22.64%) were prescribed by their generic name and 1298 drugs (77.35%) were prescribed by their brand name. 1308 drugs (77.94%) prescribed were from WHO's Essential Medicines List 2011. Drugs acting on the cardiovascular system (23.36%) were the most frequently prescribed, followed by vitamins, minerals (18.23%) and drugs acting on the gastrointestinal system (15.73%).

Conclusion: The study has shown the pattern of diseases prevalent in geriatric patients and drug use among them. Thus, the drug utilization study can help in assessment and promotion of rational use of drugs.

Keywords: Drug utilization, Geriatric, Polypharmacy, Rational use.

INTRODUCTION

The elderly population is increasing rapidly worldwide. Their growth rate (1.9%) is higher than that of the general population (1.2%) [1]. The geriatric population is a segment of society most exposed to medication. Studies in developed countries showed that consumption of medication increases with age and that many elderly use at least three prescribed drugs concurrently [2,3]. In developing countries, the proportion of elderly using at least one medication daily ranges from 85% to 90% [4-7]. This makes them more vulnerable for drug-drug interactions and subsequently adverse drug reactions (ADRs). Geriatric patients have special problems regarding their health, social support, and economic security. Their health care needs differ from the younger population. Though geriatric patients are reported to be consumers of half the total drugs prescribed, <5% of randomized control trials have been designed for them [8].

Considering the physiological changes that occur with aging and their impact on the pharmacokinetics and pharmacodynamics of drugs, it is essential to monitor drug effects especially the ADRs and drug interactions [9]. Hence, to understand these processes better and to make drug use rational, it is necessary to study the pattern of drug use in geriatric patients.

Drug utilization study has been defined by the World Health Organization (WHO) in 1977 as "study of marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences [10]." Drug utilization study may provide insights into different aspects of drug use and drug prescribing, such as pattern of drug use, quality of use, determinants of use, and outcome of drug use.

Very few studies on drug utilization in geriatric patients have been carried out. Hence, we undertook the present study with the broad aim of understanding the pattern of drug use in geriatric patients.

METHODS

This was a cross-sectional observational study undertaken from May 2014 to July 2014 in Swami Ramanand Teerth Rural Government Medical College and Hospital, Ambajogai. The study protocol was approved by the Institutional Ethics Committee prior to the commencement of the study.

Totally, 600 patients in the geriatric age group from the outpatient departments of Swami Ramanand Teerth Rural Government Medical College and Hospital, Ambajogai were included in the study.

Patients of either sex who had completed 65 years of age on 30th April or earlier and attended outpatient departments were included in the study. Patients who were unwilling to participate in the study were excluded from the study.

Medical dispensary was attended daily in order to collect prescriptions of patients who attended various out-patient departments in the hospital. All the patients who participated in the study were given clear explanations about the purpose and nature of the study in the language they understood. Informed consent was taken from every patient who participated in the study.

The data were collected using predesigned proforma specially designed for this purpose. Patient's prescription sheet was evaluated and age and gender wise distribution of patients, diseases suffered and co-morbid conditions were examined. Analysis was carried out for total number of drugs prescribed, average number of drugs per prescription, use of fixed dose combinations (FDC), whether drugs were included in WHO-Essential Medicines List (WHO-EML), category wise distribution of drugs, route of administration of drugs. Analysis was carried out by using Microsoft Excel.

RESULTS

Table 1 shows that majority of patients were in the age group of 65-70 years of age, 416 (69.33%), followed by age group of 71-75 years

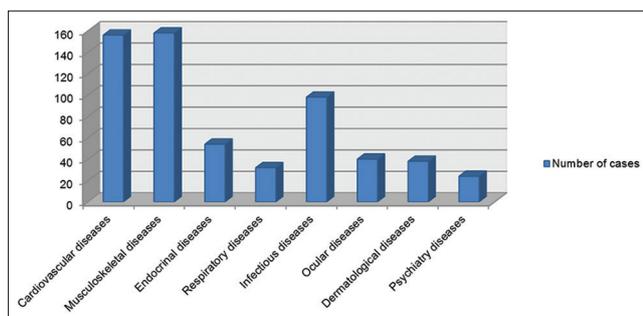


Fig. 1: Disease conditions prevalent in geriatric patients

(136, 22.66%), followed by the age group of >75 years (48, 8%) which had lowest number of patients. Out of 600 patients, 58.66% (358) were male and 41.33% (242) were females.

Out of total number of cases, diseases related to musculoskeletal system (158, 26.33%) were the most common, followed by cardiovascular diseases (156, 26%). Psychiatric diseases (26, 4%) were the least commonly encountered (Fig. 1).

Totally, 180 cases (30%) had co-morbid conditions, while 420 patients (70%) had just one disease. The minimum number of drugs per prescription was one and maximum number of drugs per prescription was 5. The average number of drugs per prescription was 2.79 showing no polypharmacy in geriatric patients (Table 2). A total number of 1678 drugs were prescribed, out of which 308 (18.35%) were FDCs and 1370 (81.65%) drugs contained only one ingredient. Oral route (1602, 95.47%) was the most common route of drug administration. 380 drugs (22.64%) were prescribed by their generic name and 1298 drugs (77.35%) were prescribed by their brand name. 1308 (77.94%) drugs prescribed were from WHO-EML.

The category wise distribution of drugs prescribed is shown in the Table 3. Drugs acting on the cardiovascular system (392, 23.36%) were the most frequently prescribed drugs, followed by vitamins, minerals (306, 18.23%), drugs acting on the gastrointestinal system (265, 15.73%) and analgesics, non-steroidal anti-inflammatory drugs (NSAIDs) (254, 15.13%). Psychiatry drugs were the least commonly prescribed drugs.

Multi-vitamin B complex drugs (208) were the most commonly prescribed drugs followed by diclofenac (176), ranitidine (166), amlodipine (118), metformin (100), gelusil (100), calcium (96), enalapril (92), ciprofloxacin (70), cetirizine (66), atenolol (62), aspirin (46), and paracetamol (42) (Table 4).

DISCUSSION

Prescribing patterns of drugs reflects clinical judgment of the clinicians. Despite advances in control of drug regulation and availability of drugs, irrational drug prescribing is still worldwide concern. This study has been undertaken for understanding the pattern of drug use in geriatric patients to identify the problems with ultimate aim to achieve rational drug use.

In this study, male subjects (58.66%) predominated as compared to females (41.33%). The mean age was 69.19 years. Our study revealed no polypharmacy in geriatric patients with average number of drugs per prescription being 2.79. Polypharmacy is unfortunately very common in India and some other countries. It results in increased cost of treatment, which may lead to non-adherence by patients as they have more medicines than they can cope with. It also increases the risk of significant adverse drug interaction.

In this study, total number 1678 drugs were prescribed to a total of 600 patients for different diseases. Out of these drugs, 18.35% were FDCs. FDCs increase the risk of drug interactions and ADRs. Moreover,

Table 1: Age and gender wise distribution of patients

Variables	Number of patients	Percentage
Age group (years)		
65-70	416	69.33
71-75	136	22.66
>75	48	8
Sex		
Male	352	58.66
Female	248	41.33

Table 2: Drug prescribing indicators

Average number of drugs per prescription	2.79
Drugs prescribed by generic name	22.64%
Drugs prescribed by brand name	77.36%
Drugs from essential drug list	77.94%
Drugs prescribed by oral route	95.47%
FDCs	18.35%

FDC: Fixed dose combinations

Table 3: Category-wise distribution of drugs

Category of drugs	Number of drugs	Percentage
Cardiovascular drugs	392	23.36
Drugs acting on endocrine system	124	7.38
Antimicrobial drugs	144	8.58
Drugs acting on gastrointestinal system	264	15.73
Vitamins, minerals	306	18.23
Analgesics, NSAIDs	254	15.13
Anti-allergic drugs	68	4
Ocular drugs	40	2.38
Psychiatry drugs	34	2
Drugs acting on respiratory system	188	11.2

Total number of drugs prescribed=Actual drug. *Number of patient prescriptions, NSAIDs: Non-steroidal anti-inflammatory drugs

Table 4: 10 most frequently prescribed drugs

Name of the drug	Number of prescriptions
Multi-vitamin B complex	208
Diclofenac	176
Ranitidine	166
Amlodipine	118
Metformin	100
Gelusil	100
Calcium	96
Enalapril	92
Ciprofloxacin	70
Cetirizine	66

they cause difficult in titrating the dose of a particular drug as it is not possible to increase or decrease the dose of an individual ingredient alone. The use of FDCs can improve compliance with therapy by decreasing the number of formulations to be taken, but their risk/benefit ratio should be assessed before they are prescribed. However, considering that the total number of FDCs in India, which is around 60% of all available formulations [11], the use of FDCs in our institution is relatively low reflecting the rational use of medicines.

Out of total number of prescribed drugs, 380 (22.64%) were prescribed by their generic name which falls short of WHO recommendation of 100%. Very few studies have been conducted focusing on this aspect of drug prescribing. These findings clearly indicate that there is a need to encourage prescribing by generic names, particularly in hospitals attached to medical colleges. However, due to aggressive marketing by pharmaceutical companies and a faulty drug policy, doctors prefer to

use the brand name of drugs in their prescribing in India. Prescribing by generic name allows flexibility of stocking and dispensing various brands of a particular drug that are cheaper than and as effective as proprietary brands. This is the basis of use of drugs from essential drug list [12]. 77.74% drugs prescribed were from WHO-EML list, again suggestive of rational drug use.

Cardiovascular drugs (23.36%) were the most commonly prescribed drugs, followed by vitamins, minerals (18.23%). Among cardiovascular drugs, antihypertensives were most commonly prescribed. The incidence of hypertension among the geriatric population is very high and is a significant determinant of cardiovascular risk in this group. The tendency for blood pressure to increase with age may depend upon environmental factors such as diet, stress, and inactivity. Senescent changes in the cardiovascular system leading to decrease vascular compliance and decreased baroreceptor sensitivity contribute to rising blood pressure. The hallmark of hypertension in elderly is increased vascular resistance.

The high occurrence of vitamins and other supplements is not surprising as many people don't consume an optimal amount of vitamins by diet alone. Physicians should make specific efforts to learn about their patient's use of vitamins to ensure that they take only the vitamins that they should. The third most frequently prescribed drugs were drugs acting on the gastrointestinal system (15.73%), followed by analgesics, NSAIDs (15.13%). The use of analgesics in the elderly is due to complaints of body pains by this special population. Multi-vitamin B complex drugs (208) were the most commonly prescribed drugs followed by diclofenac (176), ranitidine (166), amlodipine (118), metformin (100), gelusil (100), calcium (96), enalapril (92), ciprofloxacin (70), cetirizine (66), atenolol (62), aspirin (46), paracetamol (42).

Musculoskeletal diseases (26.33%) were the most common, followed by cardiovascular diseases (26%). Psychiatric diseases (4%) were the least commonly encountered. This in sharp contrast to findings from Western countries, where psychiatric conditions are among the most common. This low prevalence of psychiatric conditions in our study could be due to poor awareness regarding psychiatric conditions among patients and family members. 30% of the cases had co-morbid conditions. The presence of co-morbid conditions means that multiple and complex drug therapy is required and thus chances of ADRs and drug interactions are greater.

In many prescriptions, dose and duration were not mentioned indicating inappropriate prescribing. Inappropriate medication in geriatric patients has been linked to many ADRs, poor physical functioning, and excess health care use. Appropriate drug selection by a physician for elderly patients can spare them of these evils.

CONCLUSION

This study has shown the patterns of diseases prevalent in geriatric patients and drug use in our set up. However, this study has some limitations. Findings of this study can only be generalized to tertiary care teaching hospital in a developing country. Only patients who attended out-patient departments were included in this study. The drug treatment varies from physician to physician for the given condition and the study has not addressed this issue. However, it identified certain lacunae in prescribing pattern, need for the guidelines and further studies for drug usage in geriatric patients.

REFERENCES

1. Chanana HB, Talwar PP. Aging in India: Its socioeconomic and health implications. *Asia Pac Popul J* 1987;2(3):23-38.
2. Barat I, Andreasen F, Damsgaard EM. The consumption of drugs by 75-year-old individuals living in their own homes. *Eur J Clin Pharmacol* 2000;56(6-7):501-9.
3. Kaufman DW, Kelly JP, Rosenberg L, Anderson TE, Mitchell AA. Recent patterns of medication use in the ambulatory adult population of the United States: The Slone survey. *JAMA* 2002;287(3):337-44.
4. Mosegui GB, Rozenfeld S, Veras RP, Vianna CM. Quality assessment of drug use in the elderly. *Rev Saude Publica* 1999;33(5):437-44.
5. Bertoldi AD, Barros AJ, Hallal PC, Lima RC. Drug utilization in adults: Prevalence and individuals determinants. *Rev Saude Publica* 2004;38(2):228-38.
6. Ribeiro AQ, Rozenfeld S, Klein CH, César CC, Acurcio Fde A. Survey on medicine use by elderly retirees in belo horizonte, Southeastern Brazil. *Rev Saude Publica* 2008;42(4):724-32.
7. Rozenfeld S, Fonseca MJ, Acurcio FA. Drug utilization and polypharmacy among the elderly: A survey in Rio de Janeiro City, Brazil. *Rev Panam Salud Publica* 2008;23(1):34-43.
8. Zaveri HG, Mansuri SM, Patel VJ. Use of potentially inappropriate medicines in elderly: A prospective study in medicine out-patient department of a tertiary care teaching hospital. *Indian J Pharmacol* 2010;42(1):95-8.
9. Starner CI, Gray SL, Guay DR, Hajjar ER, Handler SM. Geriatrics. In: Dipiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, editors. *Pharmacotherapy A Pathophysiologic Approach*. 7th ed. New York: McGraw Hill; 2008. p. 57-66.
10. World Health Organisation. Introduction to drug utilization research. Geneva: World Health Organisation; 2003. Available from: https://www.who.int/entity/medicines/areas/quality_safety/safety_efficacy/utilization.
11. Desai SV. Essential drugs and Rational drug therapy. *Bull Soc Ration Ther* 2001;12:2-7.
12. Adibe MO, Aguwa CN, Ukwe CV, Okonta JM, Udeogaranya PO. Outpatient utilization of antidiabetic drugs in the south eastern Nigeria. *Int J Drug* 2009;1(1):27-36.