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Drug Utilization Pattern among Geriatric Patients in A Tertiary Care Teaching Hospital

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ABSTRACT

The elderly population is one of the most rapidly increasing populations in the world. Physiological alterations induced by the aging process make these individuals more susceptible to chronic diseases and, consequently, to increased drug utilization. The present study evaluated drug utilization pattern in geriatric medical out patients. A prospective, observational, cross sectional study was done among the geriatric patients attending the Outpatient Department of tertiary care Hospital. This study has shown the patterns 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 inappropriately prescribed drugs. Prevalence of polypharmacy was high. This indicates that there is a need for multidisciplinary, multifaceted & multisector approach which may improve drug safety & adherence in the elderly. Drug utilization studies of this type may ultimately help in improving the quality of healthcare given to the geriatric patients.

Keywords: Drug Utilization, Geriatric patients, Polypharmacy.

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INTRODUCTION

A major emerging demographic issue of the 21st century is the ageing of population as an inevitable consequence of the demographic transition experienced by most countries. India's older population will increase dramatically over the next four decades. The share of India's population ages 60 and older is projected to climb from 8 percent in 2010 to 19 percent in 2050, according to the United Nations Population division. By mid-century, India's 60 and older population is expected to encompass 323 million people, a number greater than the total U.S. population in 2012. This profound shift in the share of older Indians—taking place in the context of changing family relationships and severely limited old-age income support—brings with it a variety of social, economic, and health care policy challenges[1]. The human body is in a state of change as the years go by. There is a progressive functional decline in many organ systems with advancing age. Age-associated physiologic changes may cause reduction in functional reserve capacity. Inter individual differences in age related pharmacokinetic & pharmacodynamic changes as well as co-morbid conditions have to be considered while prescribing medicines in elderly population[2]. Changes in the pharmacokinetic profiles of drugs occur in the elderly because of reduced body water, reduced renal and hepatic function and increased body fat. Multiple drug use & polypharmacy is highly prevalent in elderly exposing them to drug interactions& increased cost of therapy[3]. Drug utilization research 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.[4] Drug utilization research may provide insights into different aspects of drug use and drug prescribing, such as pattern of use, quality of use, determinants of use and outcome of drug use. Drug utilization is an important component of many research initiatives that examine the clinical and economic effectiveness of pharmacotherapy. Monitoring medication use and knowledge of prescription habits are some of the strategies recommended for containing and controlling medication cost and its effect on the national budget[5]. The present study evaluated drug utilization pattern in geriatric medical out patients.

MATERIALS AND METHOD

A prospective, observational, cross sectional study was done among the geriatric patients attending the Outpatient Department of tertiary care Hospital, Erode. Prescriptions were collected from geriatric patients of either gender who had completed 65 years attending department like medicine, surgery, orthopedics, psychiatry, skin, TB and chest, ophthalmology

and ENT and analyzed. The study was conducted after getting approval from the institutional ethical committee and written informed consent from the patients. The study was done for a period of seven months from January 2014 to July 2014

RESULTS AND DISCUSSION

The demographic data [Table 1] shows that the majority of the patients were in the age-group of 65–74 years (249/342; 72.8%), followed by age-group of 75–84 years (67/342; 19.6%); the lowest number of patients (26/342; 7.6%) were in the age-group of >85 years. Out of the total 342 patients, 61.69% (211/342) were males and 38.30% (131/342) were females [Table 2].

Table 1: Age Distribution of Patients

Sociodemographic parameters	Characteristic group (years)	No. of patients (n=342)	Percentage of patients
Age	65-74	249	72.8
	75-84	67	19.59
	≥85	26	7.6

Table 2: Gender wise Distribution of Patients

Sociodemographic parameters	Characteristic group	No. of patients (n=342)	Percentage of patients
Sex	Male	211	61.69
	Female	131	38.3

The majority of patients, (128/342; 37.42%) were illiterate. 113 patients (33.04%) had studied only up to the 10thstandard; 3.5% (12/342) had completed postgraduate education [Table 3]. Majority of patients 286(83.62) were not working and only 56(16.37) patients were working [Table 4]. Only a small proportion of the patients (27/342; 27.63%) were living alone, and the majorities (252/342; 73.68%) were living with their families [Table 5].

Table 3: Literacy status of Patients

Sociodemographic parameters	Characteristic group	No. of patients (n=342)	Percentage of patients
Literacy	illiterate	128	37.42
	Upto 10th	113	33.04
	Upto 12th	52	15.2
	Graduation	37	10.81
	Postgraduation	12	3.5

Table 4: Literacy status of Patients

Sociodemographic parameters	Characteristic group	No. of patients (n=342)	Percentage of patients
Employers	Working	56	16.37
	Non Working	286	83.62

Table 5: Living status of the Patients

Sociodemographic parameters	Characteristic group	No. of patients (n=342)	Percentage of patients
Status of living	living alone	252	73.68
	living with family	90	26.31

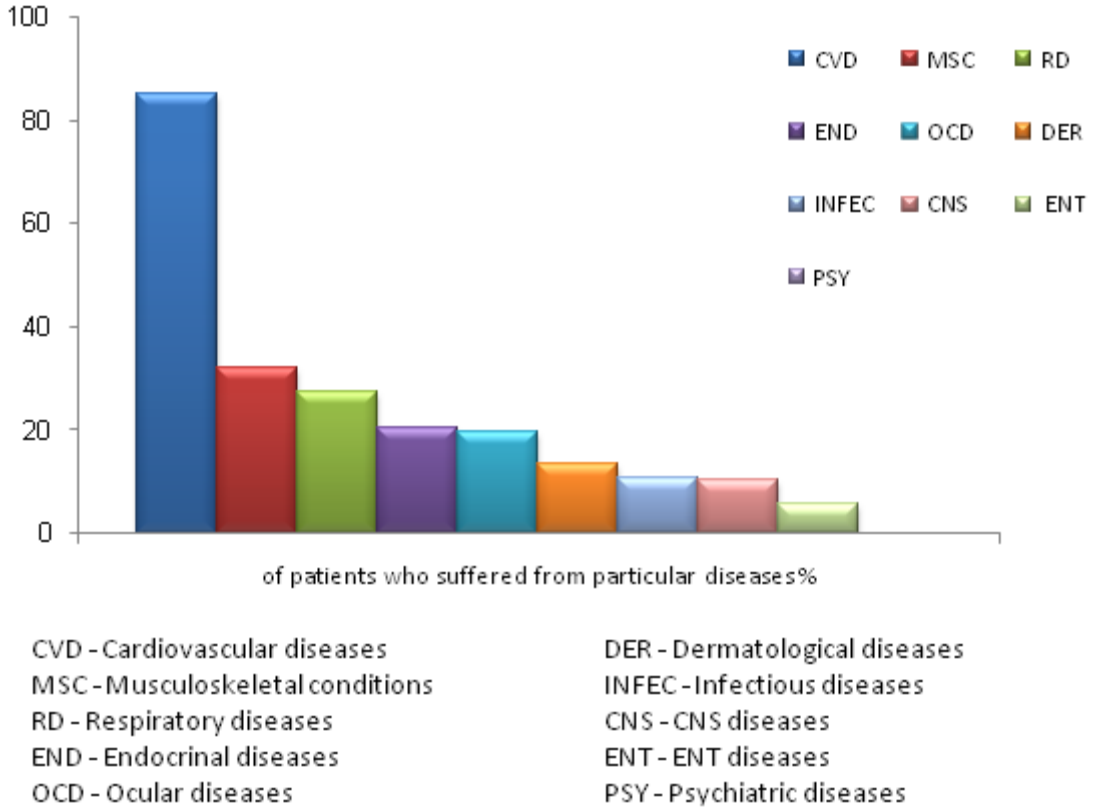

Figure 1: Disease conditions prevalent in geriatrics patients

A total of 709 disease conditions were found to be prevalent among these patients [Figure. 1]. Diseases related to the disorders of the musculoskeletal system such as osteoarthritis and new fractures due to fall. The notable feature was that psychiatric conditions were very uncommon (1.75%). The majority of patients in our study had comorbid conditions. The prevalent comorbidities in our study are very similar to the ones reported in another Indian study[6]. Loss of functional reserve with aging makes geriatric patients vulnerable to the development of multiple diseases affecting different body systems. The presence of comorbidities means that multiple and complex drug therapy is required and thus the chances of ADRs and drug interactions are greater. The department-wise distribution of patients and drug use is shown in Table 6. The average number of drugs per prescription was 7.56±3.23. The highest number of drugs per prescription was seen in the TB and Chest Department (10.63±4.55) and lowest number of drugs per prescription was in the Ophthalmology Department (5.48±1.44). Of these 342 patients,

83(24.26%) were taking less than five medicines per day. Polypharmacy and high polypharmacy were found in 178 (52.08%) and 80 (23.39%) patients, respectively. Average number of drugs prescribed per prescription was 7.56±3.23 in geriatric patients. Considering the types of patients visiting a tertiary care hospital and the tendency for comorbidities in the elderly, this high number of medicines per prescription is not unexpected. In our study, 75.74% of patients were prescribed more than five medicines per day which, by definition, amounts to polypharmacy. It seems likely that polypharmacy is a common practice in South Asian counties. Considering the adverse outcomes associated with polypharmacy, including adverse drug events, drug–drug interactions (often very complex), increased cost of medications and/or treatment, increased risk of hospitalization, patient non-adherence with treatment (which increases with complex regimens), and various medication errors, we need to take appropriate measures for minimizing the extent of polypharmacy[5]. Category-wise distribution of drugs prescribed is shown in Table 7. Drugs acting on the cardiovascular system (576; 22.28%) were the most frequently prescribed drugs, followed by antimicrobials (445; 17.2%), drugs acting on the gastrointestinal system (370; 14.3%), vitamins and minerals (297; 11.5%), analgesic and anti-inflammatory drugs (282; 10.9%), drugs acting on endocrine system (246; 89.5%), drugs acting on respiratory system (189; 7.3%), dermatological agents (80; 3.1%), drugs acting on central nervous system (31; 1.2%), drugs acting (31; 1.2%) on renal system (23; 0.9%) and others (19; 0.73%). Nearly one-fourth of the drugs prescribed in this study were for cardiovascular conditions. This is not surprising as cardiovascular conditions topped the list of diseases in our patients. Following this, in descending order of frequency, the prescribed drugs included antimicrobial agents, drugs acting on the gastrointestinal system, vitamin supplements, and analgesic and anti-inflammatory drugs. We identified the ten most frequently prescribed drugs in this study. Omeprazole was found to be the most frequently prescribed drug [Table 8]. Though Omeprazole was the most frequently prescribed drug, the prevalence of gastrointestinal diseases was very low in our study. Omeprazole was probably being prescribed for prophylaxis against nonsteroidal anti-inflammatory drug (NSAID)-induced gastritis. The next most frequently used drugs, second and third in ranking in our study, were found to be aspirin (in antiplatelet doses,) and diclofenac sodium. Their large-scale use can be explained by the high prevalence of cardiovascular and musculoskeletal conditions, respectively. In the present study, vitamin B complex prescribed in 73% prescriptions; this can perhaps be considered as nutritional supplement in geriatric patients; very few indications exist for its therapeutic use. Among the cardiovascular drugs, amlodipine and atorvastatin were prescribed in 71.51% and 54.25% of prescriptions, respectively. Their use

correlates with the high frequency of cardiovascular conditions (85.08%) in the patients included in this study. Though recent guidelines suggest that thiazide diuretics should be the drug of first choice for treatment of hypertension in elderly (with calcium channel blockers being the drug of second choice.[5,6]

Table 6: Department-wise distribution of patients and drug use among them

Department	No. of patients (n=342)	Total no. drugs prescribed
Medicine	153	1157
Orthopedics	56	361
Ophthalmology	37	203
TB and chest	33	351
Skin	29	306
ENT	25	156
Psychiatry	9	52

Table 7: Category-wise distributions of drugs

Category of drugs	No. of drugs	Percentage of patients
Cardiovascular drugs	576	22.28
Antimicrobial agents	445	17.2
Drugs acting on gastrointestinal system	370	14.3
Vitamins, minerals, and dietary supplements	297	11.5
Analgesic and anti-inflammatory drugs	282	10.9
Drugs acting on endocrine system	246	9.5
Drugs acting on respiratory system	189	7.3
Dermatological agents	80	3.1
Drugs acting on central nervous system	31	1.2
Ocular drugs	28	1.1
Drugs acting on renal system	23	0.9
Others *	19	0.73
Total	2586	100

Table 8: Ten most frequently prescribed drugs

Name of drug	No. of prescriptions (%)
Omiprazole	129
Aspirin	99
Diclofenac sodium	80
Amlodipine	71
B complex	73
Salbutamol	57
Ciprofloxacin	55
Atorvastatin	54
Paracetamol	51
Calcium + vitamin D3	51

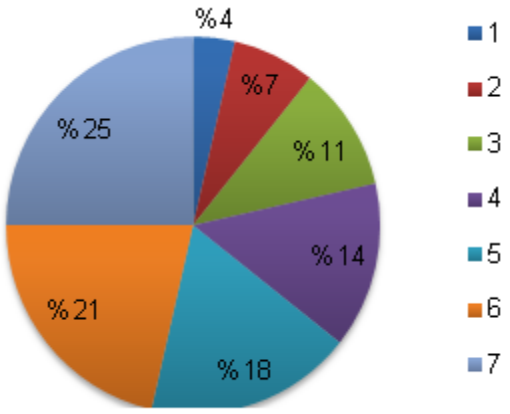

Figure 2: Distribution of comorbidities in the patients Number of diseases patient simultaneously suffering from

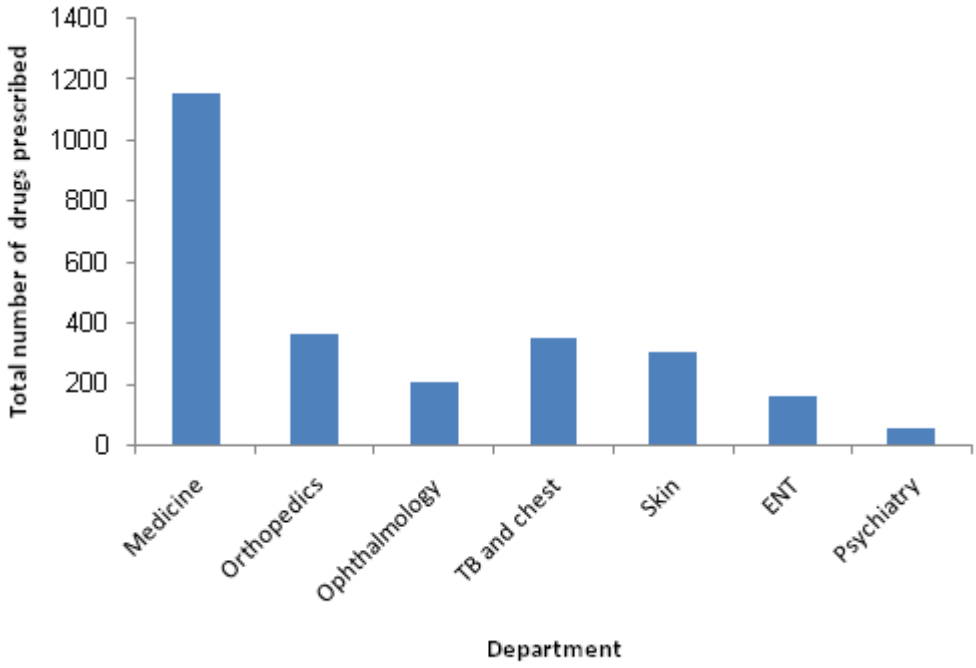

Figure 3: Department-wise distribution of patients and drug use among them

CONCLUSION

This study has shown the patterns 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 inappropriately prescribed drugs. Prevalence of polypharmacy was high & is usually unavoidable in the elderly. This indicates that there is a need for multidisciplinary, multifaceted & multisector approach which may improve drug safety & adherence in the elderly. Drug utilization studies of

this type may ultimately help in improving the quality of healthcare given to the geriatric patients.

REFERENCES

1. United Nations Population Division (UN), World PopulationProspects: The 2010 Revision (New York: United Nations, 2011),accessed at http://esa.un.org/unpd/wpp/index.htm, on Jan. 12,2012.
2. McLean AJ, Le Couteur DG, Aging biology and geriatric clinical pharmacology, *Pharmacol Rev*. 56;2004:163-84.
3. Jorgensen T, Johansson S, Kennerfalk A, Wallander MA, et al, Prescription drug use, diagnoses, and healthcare utilization among the elderly, *Ann Pharmacothe*r.35;2001:1004-9.
4. World Health Organisation. Introduction to drug utilization research.Geneva: World Health Organisation; 2003
5. Shah RB, Gajjar BM, Desai SV. Drug utilization pattern among geriatric patients assessed with the anatomical therapeutic chemical classifiation / defied daily dose system in a rural tertiary care teaching hospital. *Int J NutrPharmacolNeurol Dis*. 2012; 2: 258-65.
6. Satoshkar RS, Bhandarkar SD and Rege NN. Pharmacology and Pharmacotherpaeutics. 20th ed. Mumbai: Popular Prakashan Private Limited; 2007.