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Profile of Drug Utilization Among Elderly Patients Attending A Cardiology Clinic In Mangalore, India

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ABSTRACT

Geriatric population in India is on the rise. Cost of pharmacological treatment and drug interactions due to polypharmacy is a concern in elderly population. The study of prescribing pattern helps to make medical care rational and cost effective. Objective of the study was to describe and analyze the profile of prescriptions among geriatric patients attending a cardiology clinic. Two hundred and twelve prescriptions of geriatric patients, during January to December 2007 in a cardiology clinic, were analyzed. Those aged 70-74 years formed the largest group. Polypharmacy of 4 or more drugs was found in 71.77% of prescriptions. Diabetes mellitus was associated with 29% of 178 prescriptions for ischemic heart disease with hypertension. Large number of drugs prescribed were not found in essential drug list. Anti-platelets were the most often prescribed drug followed by beta blockers and nitrates. Average cost of medications /day was Indian rupees 21.64. Cost of diabetic medications/day was Indian rupees 6.03. Study represents current prescribing trend in cardiovascular drugs among elderly patients.

Key words: Poly pharmacy, drug utilization, fixed dose combination, geriatric population

INTRODUCTION

Drug usage patterns change as a result of the increasing incidence of disease with age and the tendency to prescribe multiple drugs for patients¹. Increased incidence of multiple diseases in geriatric age groups, may actually increase the need for multiple medications. The cost of drugs can be a major disincentive in elderly patients in India receiving meager retirement incomes, usually dependent on their children and hardly covered by health insurance. The prescriber must always be on the look out for cheaper alternative therapies¹. Even though compliance is likely to be better, with single drugs, use of two or more drugs (polypharmacy) is inevitable in conditions like moderate to severe hypertension. However, it should be remembered that polypharmacy may be the cause of most serious cases of drug toxicity, drug interactions and over dosage¹.

Prescription audit is a part of drug utilization studies². The study of prescribing pattern also aims to monitor, evaluate and suggest modifications in prescribing practices. This helps to make medical care rational and cost effective³. Prescription analysis and drug utilization studies provide feedbacks to prescribers and create awareness about the irrational use of drugs^{4,5}. Because of the lacunae in rational drug policy, production of pharmaceutical preparations in India is grossly distorted⁶. More than 70,000 formulations are available in India, compared to approximately 350 preparations listed in WHO essential drug list⁷.

Aim of the study was to determine the utilization of drugs for cardiovascular diseases and diabetes mellitus in elderly patients. Estimation of the cost of medications in these patients was another objective.

MATERIALS AND METHODS

Study design

This is an observational and descriptive study. A longitudinal retro-

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spective design was employed to analyze the prescriptions of all the geriatric patients attending an exclusive cardiac clinic in Mangalore, during 2007⁸.

Data sources and analysis

Computerized demographic and clinical data were accessed from the records of cardiology clinic after obtaining permission from institutional ethics committee. All the prescriptions for the year 2007 stored in the computer were analyzed⁸. Those aged 65 years or more were considered as belonging to geriatric age group¹. The number of drugs prescribed in every prescription (Geriatric group) was taken into account to calculate the incidence of polypharmacy. Brand names were identified and cost calculated using 'Drug today ready reckoner of current medical formulations'⁹ and the website www.mims.com¹⁰. Cost of each drug in all the prescriptions were considered to arrive at the average cost of medications per day. Prescribing frequency was expressed as a percentage of the number of prescriptions for each of the listed drugs out of the total number of prescriptions.

Statistical analysis

Data was analyzed using SPSS package 10.5.

RESULTS

During the study period 212 (14.74%) of all prescriptions (1438) belonged to geriatric age group. There were 133 males and 79 females. Most of the patients were almost equally distributed in 65-69 years (40%) and 70-74 years (42%) age groups.[Table 1]. Almost 70% of prescriptions carried more than one diagnosis. IHD (Ischemic heart disease) was the most often encountered (63.20%) diagnosis among 212 patients followed closely by hypertension (55.18%). Diabetes mellitus was seen in 26.4% of patients.[Table 2 & 3]. There were 962 drug formulations distributed among 212 prescriptions. Mean number of drugs per prescription was 4.53. Polypharmacy of more than one drug was seen in 96% of the prescriptions where as 142 (67%) prescriptions had four drugs or more.[Table 4]. Among the 962 drugs prescribed nearly half (436) were not from the WHO approved essential drug list. There were 128 (13.3%) fixed dose combinations. Antiplatelets (155) were the most often prescribed group of drug, followed by beta-adrenergic antagonists (117) and nitrates (115). [Table 5]. There were 87 prescriptions for Statins. Among fixed dose combina-

Table 1. Age/Sex profile of geriatric patients

Age in years	Number of prescriptions among males	Number of prescriptions among females	Total number of prescriptions
65-69	52	34	86
70-74	63	27	90
75-79	9	13	22
>80	9	5	14
Total	133	79	212

Table 2. Distribution of number of diseases

Number diseases/Prescription	Number Of prescriptions (n=212)
1	65
2	115
3 or more	32

Table 3. Distribution of prescriptions in Diabetes mellitus & Cardiovascular diseases

Diseases	Number of prescriptions*
n=212 (%)	
Hypertension	117 (55.2)
Old Myocardial infarction and/or Angina	134 (63.20)
DM	56 (26.41)
Left ventricular Dysfunction.	21 (9.90)
Chronic obstructive pulmonary disease	28 (13.20)
Others	35 (16.50)

Table 4. Incidence of Polypharmacy

No. Of Drugs per Age Prescriptions	Age				Total n=212(%)
	65-69 n=86(%)	70-74 n=90(%)	75-79 n=22(%)	>80 n=14(%)	
1	4(4.6)	4(4.4)	0(0)	0(-)	8(3.7)
2	9(10.4)	10(11.1)	1(4.5)	1(7.1)	21(9.9)
3	14(16.3)	13(14.4)	2(9.0)	2(14.2)	31(14.6)
4	20(23.2)	19(22.1)	3(13.5)	4(28.4)	46(21.6)
5	21(24.4)	20(22.2)	7(31.5)	4(28.4)	52(24.5)
6	8(8.3)	11(12.2)	4(18)	1(7.1)	24(11.32)
7	6(6.9)	7(7.7)	2(9)	1(7.1)	16(7.4)
8	2(2.3)	5(5.5)	1(4.5)	0(-)	8(3.7)
9	1(1.1)	1(1.1)	2(9)	1(7.1)	5(2.3)
10	1(1.1)	0(-)	0(-)	0(-)	1(6.4)

$\chi^2 = 4.69, p=0.584$

Table 5. Analysis of prescriptions

Details of prescription	Numbers
Number of prescriptions	212
Total number of drugs prescribed	962
No. of drugs from essential drug list(WHO or India)	436
Average no. of drugs per prescription	4.53
Number of fixed dose combinations	128
Fixed dose combinations in the WHO approved list	0
Details of cost	Cost in rupees
Total cost of medications in all the prescriptions/Day	4586.80
Average cost/Prescription/Day	21.64
Total cost of medications for cardiovascular diseases	3347.95
Average cost of medications for cardiovascular diseases/Prescription/Day	17.53
Total cost of diabetic medications	337.75
Average cost of diabetic medications/ Prescription/Day	6.03

tions, preparations containing Clopidogrel and Aspirin were the commonest (39%). A total of Rs 4586.80 was spent on drug acquisitions in 212 prescriptions at an average of Rs.21.60/prescription/day. Money spent on drugs for cardiovascular diseases was Rs.17.53 and for diabetes mellitus Rs 6.03 per day. Cost of Clopidogrel-Aspirin combination and Atorvastatin varied between rupees three to eight and seven to thirty respectively, depending upon the manufacturer. Clopidogrel and Aspirin fixed combinations (23.60%) and Statins (41.03%) added substantially to the cost of medications in cardiovascular diseases (25.1%).

Table 6. Distribution of prescriptions for diseases of Cardiovascular system and DM

Drugs	Number of prescriptionsn=212	Percentage
For Cardiovascular diseases		
Antiplatelets	155	73.1
Betablockers	117	55.1
Nitrates	115	55.24
Statins	87	41.03
Diuretics	73	3.43
Ca ⁺⁺ channel blocker	65	36.66
Angiotensin receptor blocker	44	20.75
ACE-Inhibitor	34	16.03
For Diabetes mellitus		
Sulfonylureas	28	13.20
Biguanides	28	13.20
Insulin human	12	5.66
Glitazone	4	1.88
Fixed dose combinations		
Clopidogrel+Aspirin	50	23.58
Hydrochlorothiazide +Others	42	19.8
Atenolol+Others	17	8.0
Others	19	8.96

DISCUSSION:

Average number of drugs per prescription is an important index of the scope for review and intervention in prescribing practices. A community-based study on prescribing pattern conducted from retail outlets in India reported a mean number of 2 drugs per prescription¹¹ which was less than what was observed in the present study. Other hospital-based studies in India reported figures of 3-5 drugs per prescription^{12, 14}. It is difficult to keep the mean number of drugs per prescription below two, but higher figures always be justified in geriatric patients because of the increasing risk of drug interactions¹⁵ and errors of prescribing associated with polypharmacy and multiple drug therapy may predispose to adverse effects¹⁶. Increasing age and increase in the number of drugs per prescriptions, were found to be not statistical significant (p=0.584). Similar findings are reported by Denis Xavier et.al¹⁷. As more than 80% of the patients had both ischaemic heart diseases and hypertension and almost similar class of drugs are used in both the conditions, medications for ischaemic heart diseases and hypertension were not analyzed separately. Antiplatelets were prescribed for 155 (73%) patients, which is more than the prevalence of cases of ischaemic heart diseases (134) as Antiplatelets are often indicated in primary prevention of coronary artery disease in those with risk factors for the same¹⁸. A reason for high prevalence (55%) of drugs prescribed which are not found in essential drug list requires further inquiry. Overall average cost of medications per day was INR [Indian Rupees] 21.64. Average cost was INR 17.53 for medications used for cardiovascular diseases and INR 6.03 for diabetes mellitus. In our study it was found that most of the geriatric patients in this cardiology clinic were prescribed more than two drugs as nearly 70% of the patients were suffering from two or more diseases. Increasing age was not related to increase in the number of drugs per prescription. Higher prevalence of use of Clopidogrel –Aspirin combinations (23.60%) and Statins (41.03%) added substantially to the cost of medications. Cost of these formulations account for about 25% of the cost of medications for cardiovascular diseases. Hence choosing less expensive brands of these drugs can considerably reduce the cost.

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