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RESEARCH ARTICLE

PHARMACOLOGY

PRESCRIBING PATTERN OF ANTIHYPERTENSIVES IN GERIATRIC AND NON GERIATRIC INDIVIDUALS – A COMPARATIVE STUDY

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ABSTRACT

Objective- analysis of prescribing pattern of antihypertensives in geriatric and non geriatric individuals. Results- a total of 210 prescriptions were analyzed using chi square test. Out of 81 prescriptions in non geriatric hypertensive individuals 34% received calcium antagonists, 21% beta blockers, 11% angiotensin converting enzyme inhibitors, 8% angiotensin receptor blockers and 12.5% fixed dose combination of angiotensin receptor blocker and hydrochlorothiazide. Rest of 129 geriatric patients 23% had calcium antagonists, 20% beta blockers, 17% angiotensin receptor blockers, 9% angiotensin converting enzyme inhibitors and 15% fixed dose combination of angiotensin receptor blocker and hydrochlorothiazide. [$\chi^2 = 4.92$, $p=0.43$]. Conclusion- the present study shows the prescribing pattern does not differ depending on the age of the individual rather it depends on duration and severity of illness and co morbid conditions. Calcium antagonists are commonly prescribed drugs in both geriatric and non geriatric individuals. Angiotensin receptor blocker, alone or in combination with hydrochlorothiazide, are increasingly prescribed in geriatric individuals.

KEYWORDS

Hypertension, Geriatric, Antihypertensives, Angiotensin Receptor Blocker

INTRODUCTION

Hypertension is one of the common factors that affect the morbidity and mortality of numerous chronic diseases namely – congestive cardiac failure, stroke, end stage renal disease etc., Hypertension is often associated with chronic diseases in geriatric population.¹⁻³ Therefore, treatment of hypertension in elderly age group is emerging as a significant health problem.⁴⁻⁵ Although systolic blood pressure is the strongest cardiovascular risk factor in the elderly, diastolic blood pressure continues to be an independent risk predictor of great importance.⁶

The classic dependent and independent predictors of cardiovascular morbidity and mortality such as age, sex, smoking, total cholesterol, LDL cholesterol, hypertension, diabetes mellitus etc., cannot predict the cardiovascular outcome precisely in age group more than 75 years. As the key ageing processes may interfere with the typical pathophysiology of specific diseases, thereby altering expected clinical manifestations and confounding diagnosis. Hence, the treatment of hypertension with antihypertensive drugs becomes more complex. So geriatric hypertension needs more comprehensive study to include renal, neural and hormonal control mechanisms that could contribute to the hypertension.⁷⁻⁸

At present, selection of specific antihypertensive drugs remains empirical because of insufficient controlled trials in elderly populations. Choosing the most appropriate therapeutic regimen in elderly hypertensives is complicated as they are more susceptible for side effects of the medications. So, antihypertensive agents should be initiated in smaller dosages and titrated upwards slowly in

order to prevent untoward adverse effects such as orthostatic hypotension.⁹

The traditional stepped care approach to antihypertensive therapy consisted of diuretics, sympatholytics or beta blockers. Aldosterone receptor blockade effectively lower BP in geriatric hypertension. With accumulating evidence for sympathetic nervous system hyperactivity as a significant contributor to the pathogenesis and sequelae of essential hypertension which[Delete] it is even more pertinent for older hypertensive patients. It should be remembered that sluggish baroreceptor function and reduced cardiovascular sensitivity to catecholamines make the elderly more sensitive to natural or drug induced fall in blood pressure. Atherosclerotic occlusion of the renal arteries is the predominant cause of renovascular hypertension in elderly. Medical therapy is appropriate when blood pressure is easily controlled and renal function remains stable.^{7,10-13}

MATERIALS AND METHODS

Study Design: A cross sectional study was conducted in an Out Patient and In Patient Department of General Medicine at JJM Medical College Hospital, Davangere. Data was collected for duration of 3 months (July 2011 to September 2011). It was carried out after obtaining the permission from institutional ethical committee. Permission was also obtained from head of department General Medicine to access records. Prescriptions of the patients were collected and relevant information was entered in the preformed proforma and analyzed.

Study Setting: Inpatient and Outpatient Department of General Medicine attached to JJM Medical College Hospital, Davangere.

Sample Size: During the period of 3 months (July 2011 – September 2011) a total of 210 prescriptions were collected.

Statistical Analysis: In this study, Data will be analyzed using Descriptive Statistics. Analysis of pattern of prescription between the groups i.e. geriatric and non geriatric individuals is done using chi square test.

RESULTS

This cross sectional study involved 210 prescriptions of patients treated in out patient and in patient department. Patient were divided into 6 groups depending on the ages, i.e., 40- 49, 50-59, 60-69, 70-79 & \geq 80 years.

Demographic Profile of the Study Population:

The Demographic characteristics of the patients are as shown in the table no.1. The no. of males 118(56.19%) and no. of females 102(43.81%) were nearly equal. The mean ages of male and female patients are 62.7 and 63.5 respectively.

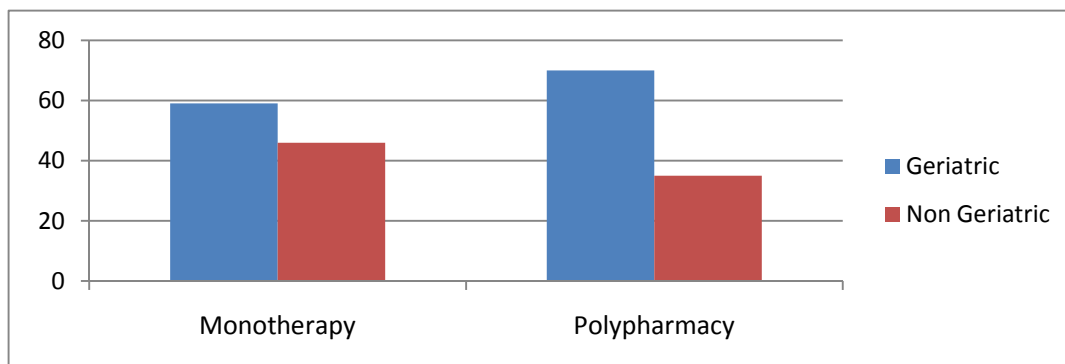
Table 1
Demographic Distribution of Antihypertensive Patients.

Age in years	Total No. of patients
40-49	53
50-59	40
60-69	66
70-79	40
Above 80	11
Total	210
Male	108
Female	102
Total	210

Table 2
Monotherapy versus Polypharmacy

	Geriatric	Non Geriatric	Total
Monotherapy	59	46	105
Polypharmacy	70	35	105

Graph I
Depicting Monotherapy versus Polypharmacy



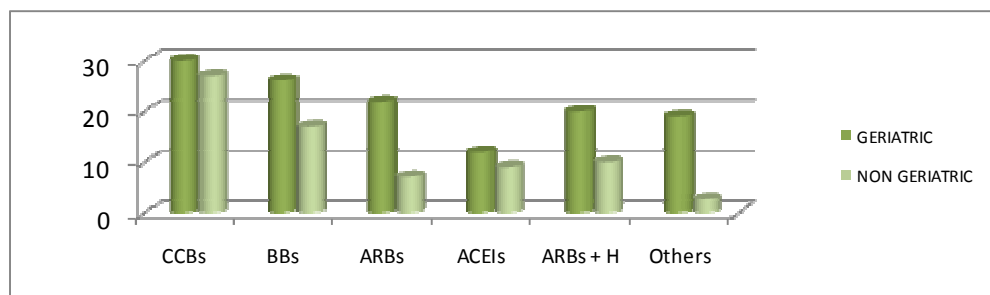
JNC 7 guidelines recommends, starting with the combination therapy of two different groups of drugs acting at different target sites. In the present study we observed that polypharmacy was more frequently prescribed in geriatric individuals as resistant cases are common in

elderly population. Another reason for prescribing polypharmacy in elderly population is they are more frequently associated with co morbid conditions such as diabetes mellitus, coronary vascular disease, etc.,¹⁴

TABLE 3
Frequency of Individual Groups of Antihypertensives Prescribed in Geriatric and Non Geriatric Population

Drugs	Geriatric	Percentage	Non-Geriatric	Percentage
CCBs	30	23	27	34
BBs	26	20	17	21
ARBs	22	17	7	8
ACEIs	12	9	9	11
ARBs+H	20	15	10	12.5
Others	19	16	11	13.5

[CCBs - Calcium Channel Blockers, BBs - Beta Blockers, ARBs - Angiotensin Receptor Blockers, ACEIs - Angiotensin Converting Enzyme Inhibitors, ARBs+H - Fixed Dose Combination of Angiotensin Receptor Blockers and Hydrochlorothiazide]



Graph II
Represents comparison of frequency of different groups of antihypertensive drugs prescribed in hypertensives of geriatric and non geriatric individuals.

In this study, we have collected data from 210 prescriptions of hypertensive individuals. In that 129 patients belong to geriatric age group and 81 patients to non geriatric age group. Prescriptions of 129 geriatric individuals had CCBs (23%), BBs (20%), ARBs (17%), ACEIs (9%), Fixed Dose Combination of ARBs and Hydrochlorothiazide (15%) and others (16%). Out of 81 prescriptions of non geriatric individuals CCBs (34%), BBs (21%), ARBs (8%), ACEIs (11%), Fixed Dose Combination of ARBs and Hydrochlorothiazide (12.5%) and others (13.5%). Other antihypertensives prescribed include clonidine and different FDCs such as Amlodipine + Hydrochlorothiazide, Olmesartan + Amlodipine, Ramipril + Hydrochlorothiazide, Telmisartan + Amlodipine, Amlodipine + Atenolol, Losartan + Hydrochlorothiazide etc., [$\chi^2 = 4.92$, $p = 0.43$]

DISCUSSION

The impressive successes of medicine and public health over the past century have made it possible for elderly persons to live longer and healthier than ever before. Individuals over the age of 65 will account for 20% of the population and more than 50% of all health care by 2030. Thus, most physicians will spend a significant portion of their professional lives dealing with older adults health care.⁵

The practice of evidence based medicine is to recognize information need while caring for a patient, identify the best existing evidence to help resolve the problem, consider the evidence in light of the actual circumstances, and integrate the evidence into a medical plan. One such method of producing the research evidence which is required to improvise the clinical practice is by prescription based survey.¹⁵

Older persons are remarkably heterogeneous: they vary in health status, prognosis, and preferences for care. Many persons in their 60s are healthy and can expect to live another 30 years or longer. Yet, chronic diseases that will cause disability and ultimately

death will develop in nearly all older persons. Therefore, physicians caring for older adults must have skills in managing multiple co morbidities and wisely guiding the patient in both "curative" and "palliative care." Because many geriatric syndromes have multiple causes, multiple targeted interventions may be a more realistic approach than trying to find a "cure." Treatment of hypertension in geriatric age group largely depends on stage of the hypertension classified according to JNC 7 classification. Treatment recommendations for older people with hypertension, including those who have isolated systolic hypertension, should follow the same principles outlined for the general care of hypertension.¹⁴

In this observational study CCBs are most frequently prescribed group of drugs. As CCBs appear well suited for elderly patients whose hypertensive profile based on increasing arterial stiffness and diastolic dysfunction secondary to decrease atrial and ventricular compliance, because they have multiple clinical applications including treatment of angina and supra ventricular arrhythmias. CCBs hold promise for treatment of elderly patients with hypertension and co morbid cardiovascular conditions. CCBs are well tolerated by elderly. Most adverse effects of DHPs relate to vasodilatation eg. Ankle edema, postural hypotension and headache.⁷

In many individuals, lower initial drug doses may be indicated to avoid symptoms; however, standard doses and multiple drugs are needed in the majority of older people to reach appropriate BP targets. This is also the population with the lowest rates of BP control. Thus, the observation made in this study justifies the use of combination therapy much more frequently in geriatric age group.

A lowest rate of blood pressure control is seen in elderly population as resistant hypertension is increasingly prevalent in geriatric age groups. One of the treatment option mentioned in standard publications for resistant hypertension is Aldosterone receptor blockers. An observation is made in the present

study that all prescriptions having spironolactone were of individuals among the geriatric age groups justifies its use.^{7,14}

ARBs alone or in combination with Hydrochlorothiazide are preferred in clinical practice of geriatric population as co morbid conditions tend to affect this population. ARBs are similar to other agents in reducing BP and are well tolerated. ARBs protect the kidney in type II diabetes mellitus both in established diabetic nephropathy with proteinuria and in patients with microalbuminuria. ARBs also reduce mortality and morbidity in patients with heart failure. ARBs are alternatives to ACE inhibitors in patients with hypertension and heart failure who cannot tolerate ACE inhibitors.¹⁴

CONCLUSION

The general recommended goal to lower blood pressure in persons with uncomplicated

hypertension is 140/90 mm Hg. However, this target for elderly patients with hypertension is based on expert opinion rather than on data from RCTs and it is unclear whether the target SBP should be the same in 65 to 79 year olds versus older patients.

In this study, the prescribing pattern does not differ depending on the age of the individual rather it depends on duration and severity of illness and co morbid conditions. Calcium antagonists are commonly prescribed drugs in both geriatric and non geriatric individuals. Angiotensin receptor blocker alone or in combination with hydrochlorothiazide is increasingly prescribed in geriatric individuals. Polypharmacy was more frequently prescribed in geriatric individuals, reason being resistant cases are more in this age group and usually elderly patients will have associated co morbidity

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