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Original Research Article

A descriptive study on drug prescribing pattern in hypertensive patients in a tertiary care teaching hospital

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ABSTRACT

Background: Hypertension is highly prevalent and the goal of antihypertensive therapy is to abolish the risks associated with blood pressure (BP) elevation without adversely affecting quality of life. Drug selection is based on efficacy in lowering BP and in reducing cardiovascular (CV) end points including stroke, myocardial infarction, and heart failure. Not many studies are conducted in this part of world regarding drug utilization of antihypertensive drugs and hence this study was planned.

Methods: A descriptive cross-sectional study was conducted for a period 6 month in outpatient department of a tertiary care centre of Government Medical College, Srinagar, Jammu and Kashmir. The prescriptions containing antihypertensive drugs were collected from the patients attending the outpatient department.

Results: During the study period a total of 230 prescriptions were collected, out of which 196 were included for the final analysis. Mean age was found to be 62.42±7.77 years. In majority of cases (44.89%), a combination of two drugs was prescribed and among the two-drug combination, Angiotensin Receptor Blockers (ARBs) and Calcium Channel Blockers (CCBs) were used most commonly (40.90%). Angiotension receptor blockers were used as single drug in most number of patients (41.66%). Proton pump inhibitors were the most common (35.71%) co-prescribed drug, followed by Anti platelet drugs (27.55%), Anti diabetics (16.32%) and Statins (16.32).

Conclusions: Present study represents the current prescribing trend for antihypertensive agents. It implies that ARBs are the leading group of antihypertensive agents both when used singly and in combination. Further studies focused on the rationale for choice of drugs based on demographic data, economic status, associated comorbid conditions and complications would give additional insights into prescribing patterns in hypertension in India.

Keywords: Anti-hypertensive drugs, Drug utilization, Prescribing pattern

INTRODUCTION

Hypertension is a disease of complex etiology, affecting 972 million people worldwide. Prevalence of hypertension in India is reported to vary from 4 to 15% in urban and 2-8% in rural population. It is a leading risk factor for coronary heart disease, stroke and chronic renal disease. Evidence from large clinical trials now suggests that lowering blood pressure effectively prevents these adverse outcomes. Selection of antihypertensive agents should therefore be based primarily on their comparative ability

to prevent these complications. Therefore, it is important that once the diagnosis of hypertension is established, blood pressure should be controlled adequately through regular follow-up, lifestyle modification, exercise and effective antihypertensive drugs.⁴

Drug utilization studies which evaluate and analyze the drug therapy in hypertension and hypertension associated diseases is very essential from time to time to observe the prescribing attitude of physicians with the aim of rational use of drugs and to minimize the adverse drug reactions.^{5,6}

In consideration of all these facts, the present study was designed to analyze the prescribing patterns of antihypertensive drugs in a tertiary care teaching hospital in Srinagar, Jammu and Kashmir.

METHODS

This was a cross sectional descriptive study conducted by the department of Pharmacology in the outpatient Department of General Medicine of Sheri Maharaja Heri Singh (SMHS) Hospital, which is one of the tertiary care teaching hospital associated with Government Medical College, Srinagar. The period of the present study was 6-months. A total of 230 prescriptions were collected, out of which a 196 were included for the final analysis.

Inclusion criteria

- Patients diagnosed with hypertension according to the Joint National Committee (JNC) 7 guidelines.
- Patients with any stage of hypertension with or without any co-morbid disease.
- Patients of either gender.
- Patients above 18 years of age.

Exclusion criteria

- Patients who did not met the inclusion criteria.
- Pregnant women of any age group.

The patients were diagnosed and treated by consultant specialist of medicine and the prescriptions containing anti-hypertensive drugs were collected from the patients attending the outpatient department of general medicine. The patient's demographics, blood Pressure, antihypertensive drugs prescribed, comorbid conditions were entered in a specially designed proforma. The statistical analysis of collected data was performed by using the latest version of SPSS and the results were formulated.

RESULTS

During the study period a total of 230 prescriptions were collected, out of which a 196 were included for the final analysis. The females dominated the male population and comprised 57.10% of the total participants. The age of the patients varied from 40 to 78 years and the majority of the participants were of 60-69 years age group, forming 53.10% of total study population. The mean age was found to be 62.42±7.77 years. The studied patients were mostly of urban origin (59.20%) than rural (39.80%). The majority of our patients (95%) presented with one or more comorbid diseases, among which Diabetes Miletus was the most common comorbid disease (23.46%) followed by post pacemaker status (10.20%), hypertensive heart disease (9.18%) and sub clinical hypothyroidism (9.18%). When the data was analysed by virtue of the number of antihypertensive drugs used, it was observed that in majority of cases (44.89%), a combination of two drugs

was prescribed, followed by three drug combination which was used in 16.32% of patients, as has been shown in Table 1. When it comes to use of single drug for controlling the hypertension it was found that only 12.24% of patients could be controlled by a single drug treatment. Among the two-drug combination, angiotensin receptor blocker (ARB) and calcium channel blocker (CCB) combination was the most common (40.90%).

Table 1: Number of antihypertensive drugs and the percentage of their utilization.

Number of antihypertensive drugs used	Number of patients (%)
Single drug	24 (12.24)
Two drugs	88 (44.89)
Three drugs	32 (16.32)
Four drugs	42 (21.42)
More than four drugs	10 (5.10)
Total	196 (100)

Table 2: Type of antihypertensive drugs used and the percentage of their utilization.

Number of antihypertensive drugs	Type of antihypertensive drugs	Number (%)
Single drug	ARBs	10 (41.66)
	BBs	8 (33.33)
	CCBs	4 (16.66)
	ACE inhibitors	2 (8.33)
Total		24 (100)
Two drug combinations	ARBs + CCBs	36(40.90)
	ARBs+ TZDUs	26 (29.54)
	CCBs+ BBs	14 (15.90)
	ARBs + BBs	8 (9.09)
	AC inhibitors + BBs	6 (6.81)
Total		88 (100)
Three drug combination	ARBs +TZDUs + BBs	14 (43.75)
	ARBs + CCBs + BBs	12 (37.55)
	TZDUs + BBs + CCBs	6 (18.75)
Total		32 (100)

ARBs: angiotensin receptor blockers, BBs: Beta blockers, CCBs: Calcium channel blockers, ACE inhibitors: Angiotensin converting enzyme inhibitors, TZDUs: Thiazide type diuretics

The combination of ARBs and thiazide type diuretics (TTDs) was prescribed in 29.54% of patients followed by combination of CCBs and beta blockers (BBs) which was used in 15.90% cases, the same has been depicted in Table 2. During the study it was observed that four drug regimens was prescribed in 21.42% of total participants and the combination of four front line antihypertensive drug classes comprising of ARBs, TTDs, CCBs and BBs was

used in most instances (61.90%). When three drug combination regimens was analysed, the combination of ARBs, TTDs and BBs was used in most instances (46.66%). Angiotension receptor blockers were used as single drug in most number of patients (41.66%), followed by BBs (33.33%) and CCBs (16.66%). It was interesting to find that in 5.10% of our studied population more than four drugs were combined together which included the addition of Potassium sparing diuretics to a ARB, BB, CCB and TTD type diuretics in most instances.

During the study period it was found that many different classes of drugs were co-prescribed along with antihypertensive drugs. Proton pump inhibitors were the most common (35.71%) co-prescribed drug, followed by antiplatlet drugs (27.55%), anti-diabetics (16.32%) and Statins (16.32).

DISCUSSION

Drug utilization studies are one of the most effective methods used to assess the prescribing pattern of different drugs by physicians.⁷ These studies are supposed to be powerful exploratory tools to ascertain the role of drugs in society.⁸ They have been found to create a sound sociomedical and health economic basis for health care decision making.⁹

During the present study it was observed that incidence of hypertension was higher in females, that was comparable to the earlier studies conducted on hypertensive patients by Tiwari et al in India, Pittrow et al, in Germany and Lee et China. 10-12 Most of the patients were in the age group of 60-69 years and the mean age was 62.42±7.77 years among both the genders. This could be due to the fact that hypertension is very common in this age group. Similar (The above same) observations were also noticed in a study conducted in India by Hari Babu et al. 13 In the present study it was observed that most commonly prescribed single drug antihypertensive agents were angiotensin receptor blockers, which was comparable with a previous study by Elliott WJ et al.14 Since diabetes mellitus was one of the most prevalent coexisting disease, the prescription of ARBs seems justified as these drugs have a protective role in diabetic patients. These drugs are known to decrease the onset and progress of micro vascular complication of hypertension and diabetes mellitus as described in previous studies. 15

An ideal combination therapy is one which must include antihypertensive drugs possessing complementary modes of action and having synergistic anti-hypertensive effects without or with minimum adverse effects, at low doses. ¹⁰ In the present study two drug combination therapy was most commonly prescribed than other combinations, which was comparable with other study conducted by Pia et al. ¹⁶ The two drug antihypertensive therapy used in the majority of patients may be justified by the fact that in most cases the patients were having some associated comorbid disease and it difficult to achieve the target blood

pressure control using a single drug. Although the combination of diuretics and angiotensin receptor blockers is the most common drug combination used in most previous studies, but during the present study, ARBs and CCBs were combined at the most, which may be because of the fact that diuretics are not preferred especially in diabetic patients because of their poor side effect profile. During the present we found that many patients who were put on Thiazide diuretics presented with several vague symptoms that included headache, nausea and vomiting and on biochemical evaluation they were found to have low levels of blood sodium, which also led to lower use of diuretic combination during the present study. The combination of an ARB with a CCB has also been found to result in fully additive BP reduction. 17,18 Addition of RAAS inhibitors significantly improves the tolerability profile of the CCB. Through their anti-sympathetic effects, RAAS inhibitors blunt the increase in heart rate that may accompany in treatment with a dihydropyridine type CCBs. In addition, RAAS inhibitors partially neutralize the peripheral edema, which is a dose-limiting side effect of these CCBs. 19 The combination of ARBs and TTDs was prescribed in almost 30% of the study population, the reason may be based on the fact that in long-term trials, combinations of an ARB or ACE inhibitor with a low dose Thiazide type diuretic has been found to be cause full additive BP reduction and has been classified as preferred combination.²⁰ Diuretics initially reduce intravascular volume and activate the RAAS, leading vasoconstriction as well as salt and water retention. In the presence of a RAAS inhibitor, this counter regulatory response is attenuated.

Among the co-prescribed drugs it was found that during the present study a large percentage of our patients were using proton pump inhibitors, antidiabetics, antiplatlet drugs and statins. Because most of our patients were given several drugs together and many of them especially Aspirin and Clopidogrel are known gastric irritants and proton pump inhibitors, the most commonly co prescribed drugs were given for gastric protection. Diabetes miletus was one of many common diseases that were found in our study population and the antidiabetics were prescribed for the treatment of the same. Antiplatlet drugs and statins were also commonly co prescribed along with many different antihypertensive drugs because they are found to have protective role in hypertension related cardiovascular diseases.

CONCLUSION

Present study represents the current prescribing trend for antihypertensive agents in this part of world. It implies that ARBs are the leading group of antihypertensive agents both when used singly or (and) in combination. The treatment of hypertension keeps on changing as newer drugs are being added and new guidelines are being put forth. Further studies focused on the rationale for choice of drugs based on demographic data, economic status, associated comorbid conditions and complications would

give additional insights into prescribing patterns in hypertension. A therapeutic audit with more parameters of analysis to provide regular feedback to researchers and prescribers may encourage rational prescribing in hypertension.

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