Section: Pharmacology

Research

PRESCRIBING PATTERN OF ANTI-HYPERTENSIVE DRUGS AND ITS ADHERENCE TO JNC -8 GUIDELINES IN A TERTIARY CARE TEACHING HOSPITAL

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Abstract

Background: Hypertension is correlated to morbidity, death, and economic costs to society, and it has emerged as a significant public health issue. The main purpose of this study is to assess prescribing patterns in hypertensive patients based on JNC 8 guidelines in a tertiary care hospital. **Materials and Methods:** A prospective, observational study was conducted at a tertiary care hospital, Sree Mookambika Institute of Medical Science, Kulasekaram, Tamil Nadu for 6 months. A total of 100 hypertensive prescriptions were screened for the study, and informed consent was obtained from all the patients. **Result:** Among 100 patients, the males were 64%, and the females were 36%. In age distribution, most of the patients were 21 – 30 years (2.2%), 31-40 years (1.6%) ,41-50 years (24.2%), 51-60 years (58.8%), and 61-70 years (13.2%). Among the monotherapy for patients, diuretics (38%) were the most commonly prescribed Monotherapy followed by β-Blockers (29%), CCBs (18%), and β-blockers (13%). The two-drug regimen β -blocker + ACEI (41%) is commonly prescribed, followed by Diuretics + CCB (32%), β - blocker + CCB (19%), and Diuretic + Diuretic (4%). In Triple Drug therapy, D+D+BB (3%), followed by BB+D+ACEI (2%), CCB+BB+D (1%), and ARB+CCB+D (1%). In Quadruple Drug therapy, BB+D+ACEI+ARB (2%), and BB+CCB+D+ACEI (1%). **Conclusion:** We conclude the preferred use of diuretics, as 1st choice of drugs for hypertension in monotherapy, triple therapy, and Quadruple therapy. There is a need for improved patient education on medication adherence and greater attention by clinicians to issues of lifestyle modifications, to improve BP control rate.

INTRODUCTION

Hypertension is correlated to morbidity, death, and economic costs to society, and it has emerged as a significant public health issue.[1] In India it is estimated that the hypertension prevalence rate among urban adults is about 25% and 10% in rural. The long-term risk of getting hypertension is present in over 90% of adults.[2] It is a basis for issues related to the heart, brain, and kidneys.[1] CCBs and ARBs were the two antihypertensive medication groups that were given the most often, with ARB prescriptions growing at the fastest rate.[3] It is notable that following JNC recommendations for prescribing antihypertensive medications resulted in significant prescription cost reductions.4 Epidemiological research revealed that the prevalence of hypertension, which ranges from 4 to 15% in urban and 2-8% in rural populations, is significantly rising in India.[4,5,6] Numerous studies have assessed the global prescribing trends for antihypertensive medications. The usage of ACEIs, ARBs, and CCBs has continually grown over the past 20 years, and a large number of well-performed clinical trials have revealed no significant variations in antihypertensive effectiveness, side effects, and quality of life among these medication classes.[7] With the use of frequent drug utilisation studies and accepted treatment recommendations, doctors will be able to administer medications logically.[8]

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Since a wide variety of drugs are available, it is the duty of the physician to prescribe the most effective and safe agent to the patient. Patient factors like age, sex, BMI, coexisting illness, and mainly their socioeconomic status will all determine the prescription pattern. Prescribing pattern of oral antihypertensive drugs has shown a series of variations over the past decade. So, the studies on prescribing trends of antihypertensive drugs, their rationality, and their adherence to Joint National Committee treatment guidelines will be a powerful exploratory tool for healthcare providers. Ultimately, such a study will improve the quality of prescriptions and will provide a greater benefit to the patient. Hence it was thought worthwhile to conduct a study on the prescription pattern of antihypertensive drugs, their rationality, and their adherence to Joint National Committee -8 treatment guidelines.

Causes

According to JNC-8, Hypertension may be due to various causes such as improper blood pressure Measurement, volume overloaded, pseudo tolerance, excess sodium intake, Non-adherence, Inadequate doses of drugs, Inappropriate combinations, Amphetamines, Sympathomimetic, Oral contraceptives, and Tobacco. Obesity and excess alcohol intake are associated causes of Hypertension.[4]

Aim

The main purpose of this study is to assess prescribing patterns in hypertensive patients based on JNC 8 guidelines in a tertiary care hospital.

MATERIALS AND METHODS

A prospective, observational study was conducted at a tertiary care hospital, Sree Mookambika Institute of Medical Science, Kulasekaram, Tamil Nadu for 6 months. A total of 100 hypertensive prescriptions were screened for the study, and informed consent was obtained from all the patients.

Inclusion Criteria

Patients diagnosed with hypertension based on American Heart Association guidelines, age group of 18 to 70 years of both genders, subjects willing to give informed consent, patients on any class of anti-hypertensive drugs, patients with the history of diabetes, coronary heart disease and renal complications, and pregnant women.

Exclusion Criteria

Critically ill patients, patients above 80 years, patients who are not willing to give informed consent, and patients with a history of Diabetic Ketoacidosis, severe drug allergy, and malignancy.

RESULTS

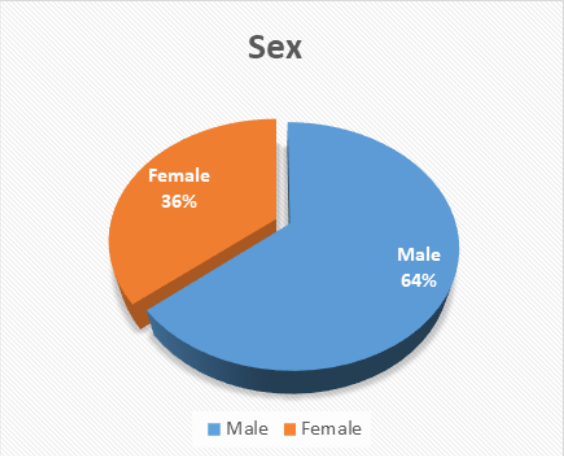

Figure 1: Distribution of gender

Among 100 patients, the males were 64%, and the females were 36%.

Table 1: Distribution of patient's characteristics.

No (%)		Male	Female
Age in years	21 – 30	1 (1.6%)	1 (2.8%)
	31 – 40	1 (1.6%)	0
	41 – 50	15 (23.4%)	9 (25%)
	51 – 60	38 (59.3%)	21 (58.3%)
	61 – 70	9 (14%)	5 (13.9%)
Stages of hypertension	Pre hypertension (120-139/80-89mmhg)	11 (17.1%)	14 (38.9%)
	Stage I (140-159/90-99mmhg)	37 (57.9%)	17 (47.2%)
	Stage II (>160/>100mmhg)	16 (25%)	5 (13.9%)
Co-Morbidities	Diabetes mellitus	26 (56.3%)	7 (41.2%)
	Chronic kidney disease	3 (6.2%)	0
	Obesity	18 (37.5%)	10 (58.8%)

In age distribution, most of the patients were 21 – 30 years (2.2%), 31-40 years (1.6%) , 41-50 years (24.2%), 51-60 years (58.8%) and 61-70 years (13.2%).

Among the monotherapy for patients, diuretics (38%) were the most commonly prescribed Monotherapy followed by β -Blockers (29%), CCBs (18%), and β-blockers (13%).

The two-drug regimen β -blocker + ACEI (41%) is commonly prescribed, followed by Diuretics + CCB (32%), β - blocker + CCB (19%), and Diuretic + Diuretic (4%).

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In Triple Drug therapy, D+D+BB (3%), followed by BB+D+ACEI (2%), CCB+BB+D (1%), and ARB+CCB+D (1%).
In Quadruple Drug therapy, BB+D+ACEI+ARB (2%), and BB+CCB+D+ACEI (1%).

Table 2: Results of JNC 8 guidelines of the study

	Therapy Recommended	%	JNC 8 guidelines	
			Adherent	Nonadherent
Pre hypertension (n=25)	Lifestyle modifications	72%	100%	0
	Calcium Channel Blockers	28%		
Stage I hypertension (n=54)	Diuretics	38%	56%	44%
	Beta-blockers	29%		
	Calcium channel blockers	18%		
	Alpha blockers	15%		
Stage II hypertension (n=21)	ACEI + Beta blocker	43%	73%	27%
	Diuretic + calcium channel blocker	34%		
	Beta-blocker + calcium channel blocker	19%		
	Diuretic + diuretic	4%		
Comorbidities (n=65)	Diuretic + calcium channel blocker	28%	78%	22%
	Beta-blocker +calcium channel blocker	15%		
	Diuretic +calcium channel blocker+ Beta blocker	7%		
	Diuretic +Diuretic +beta blocker	3%		
	ARB + calcium channel blocker +Diuretic	14%		
	ACEI + ARB+ Beta blocker+ Diuretic	7%		
	ACEI+calcium channel blocker + Beta blocker	26%		

Hypertension is more prevalent in Males (64%) and the age group of 50-60 years. Male patients are greater in percentage (26%) than female patients who have hypertension with diabetes mellitus but the percentage of obese female patients with hypertension (10%) is lower than that of male patients. Chronic kidney disease is absent in female patients. In hypertension along with its comorbidities the most frequently prescribed group of drugs are Diuretics + Calcium Channel Blockers (28%). Hypertension is categorized in a different category as given by the JNC VIII guidelines the data were analyzed and the result shows that patients with stage 1 hypertension observed in greater numbers at 54%, which is followed by prehypertension at 25% and stage 2 hypertension at 21%. The overall rate of adherence is 77% and non-adherence is 23%. Diuretics (38%) were the commonly prescribed Monotherapy and the two-drug regimen β-blocker + ACEI (41%). ACEI and ARB combination which is not recommended is administered in 7% of patients with comorbidities along with quadruple therapy.

DISCUSSION

Chataut et al,[9] reported in their study, males were more likely to have hypertension (30.6%) than females (13.8%). Male gender, smoking, and a non-vegetarian diet were found to be associated with hypertension in a bivariate study.
Vaidya et al,[10] reported the main reasons for this rise seemed to be high salt consumption and an increase in body mass index (BMI). In contrast to our study, hypertension is more prevalent in Males (64%) and the age group of 50-60 years. Obesity in males was 18 (37.5%), and in females was 10 (58.8%).

In a study by Shenoy et al,[11] FDCs were discovered in 208 (63.8%) of the 326 prescriptions. Fifty-nine prescriptions had multiple FDCs. FDCs were prescribed to 122 (72.6%) of 168 individuals who had more than one co-morbid illness (cardiovascular and diabetes mellitus). Many FDC prescriptions were not identified on the essential medicines list. Based on the findings The increased need for medications when a patient has more than one ailment supports the usage of FDCs for quality acceptance. Given the high number of FDCs given for cardiovascular disorders, a review and rationalisation of the FDCs on the important drug list may be necessary.
Bajaj et al,[12] reported that diuretics were the most commonly given antihypertensive medicines, followed by ARBs, Beta Blockers, CCBs, and ACE inhibitors. 42.6% were given monotherapy, while 57.4% were given combination treatment. Fixed medication combinations were given to 41.6% of patients. The prescription pattern was discovered to be compliant with JNC VII guidelines.
In a study by Dhanaraj et al,[13] polytherapy was used by more than half of type 2 diabetes (T2DM) patients, compared to 41% on monotherapy and 4% on no treatment. The most commonly recommended medications were angiotensin-converting enzyme (ACE) inhibitors (59%) followed by angiotensin receptor blockers (ARBs), calcium channel blockers (CCBs), and diuretics (27%). Although the antihypertensive prescription pattern demonstrated adherence to current evidence-based recommendations, a larger number of uncontrolled hypertension individuals were discovered.
Mohd et al,[14] reported amlodipine (37%), losartan (11%), and telmisartan (10%) were the most often prescribed medicines in the study population. Telmisartan + Hydrochlorothiazide 15% was the most often used antihypertensive fixed dosage

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combination medication. Based on the results calcium Channel Blockers were the most regularly prescribed pharmacological classes, followed by Angiotensin II receptor antagonists. Anti-hypertensive medication combinations were common among hypertensive patients, and this technique improved overall blood pressure control in individuals with high blood pressure.

Malpani et al,[15] reported 25% of patients were given monotherapy, whereas the majority of patients, 75%, were given multidrug treatment, with 35% given two drugs, 32% given three drugs, and 8% given four drugs. Those with diabetes and no CKD achieved 50% of the JNC-8 target, while CKD patients or no DM achieved 60% of the JNC-8 goal.

In a study by Sapkota et al,[16] ARB (32.44%), ARB+ Thiazide (15.94%), Diuretics (11.59%), CCBs + Beta-blockers (9.42%), and CCB (8.7%) were the most often prescribed antihypertensive medication groupings. JNC VII recommendations are followed by 74% of the total prescription.

In our study, the total percentage of adherence is 62.1%, with 37.9% non-adherence. The most usually given monotherapy was diuretics (38%), followed by the two-drug combo -blocker + ACEI (41%). In 28% of patients with comorbidities receiving combination of Diuretics and Calcium Channel Blocker. Unrecommended ACEI and ARB combination is administered in 7% of patients with co-morbidities along with quadruple therapy.

CONCLUSION

We concluded that with time, the choice of anti-hypertensive drugs reasonably complies with the JNC 8 guidelines on the management of hypertension, which confirms a fairly good degree of compliance by clinicians with JNC 8 guidelines. This study concludes the preferred use of diuretics, as 1st choice of drugs for hypertension in monotherapy, triple therapy, and Quadruple therapy, and most of the patients who were diagnosed as hypertensive were predominantly male. However, there is a need for improved patient education on medication adherence and greater attention by clinicians to issues of lifestyle modifications, to improve the BP control rate in this hospital.

Limitation

However, the limitations of this study are single centered and of small sample size. The treatment outcome can be improved if the adherence rate is increased further.

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