A PROSPECTIVE OBSERVATIONAL STUDY ON DRUG UTILIZATION EVALUATION OF ANTIHYPERTENSIVE DRUGS.

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Abstract

Background: The product of cardiac output (CO) and total peripheral resistance (TPR) equals blood pressure (BP). The chronic rise of arterial blood pressure is known as hypertension. An antihypertensive medicine is any medication that is prescribed to lower or normalise high blood pressure.

Objective: To assess the utilization pattern of anti-hypertensive agents in the General Medicine department of ESI hospital, Ayanavaram, Chennai.

Methodology: The study was a simple prospective observational study that was conducted over a six-month period.

Results: 245 hypertensive cases were gathered during the research period. There were 132 (53.8%) men and 113 (46.1% females) who received anti-hypertensive therapy. Only five major kinds of antihypertensive medications were utilised in the research sample. They were diuretics, calcium channel blockers, angiotensin receptor blockers, beta adrenergic blockers, and angiotensin converting enzyme inhibitors (ACEIs). Calcium channel blockers were prescribed the most frequently 57(23.2%), whereas diuretics were prescribed the least frequently 2 (0.08%).

Conclusion: In this investigation, significant variations in the use of various antihypertensive drug groups were found. These studies provide a general overview of the antihypertensive medicine prescription pattern and rational drug use. These aid in the establishment of drug policy and the encouragement of doctors to prescribe medications responsibly.

Keywords: Hypertension; Antihypertensive; Systolic blood pressure; Diastolic blood pressure; Calcium channel blockers; B-Blockers; Angiotensin converting enzyme; Angiotensin2 receptor antagonists

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INTRODUCTION

Hypertension is a common chronic health issue that has catastrophic effects on the heart and circulatory system. Blood pressure fluctuates from person to person and from time to time for people; nonetheless, high blood pressure (hypertension) is defined as blood pressure that is consistently increased over 140/90 mmHg at different periods of measurement[1]. A variety of national and international recommendations for hypertension therapy have been produced. Diuretics are recommended as the first-line therapy for hypertension in the most current JNC 8 guideline[2,3]. Because of the high frequency of hypertension and the need for drugs for extended periods of time, drug treatment costs are a key concern in health economics.

Antihypertensive therapy spending in industrialised nations has risen dramatically in recent years, owing to the growing use of newer and more expensive medications such as calcium-channel blocking agents, angiotensin-converting enzyme inhibitors, and angiotensin-receptor antagonists[4]. Drug utilisation review (DUR) is a systemic ongoing process of collecting explanatory and evaluating methods for the quantification, understanding, and analysis of the processes of medication prescribing, dispensing, and consumption, as well as the testing of interventions to improve the quality of these processes[5]. DUR aids in the investigation of prescribing patterns, followed by input to clinicians in the establishment of recommendations, and the development of a fresh approach to evidence-based decision making[6]. To assess the different classes of antihypertensive drugs in terms of diagnosis and to conduct a drug utilisation review in hypertension with its various combinations[7]. Changes in suggested recommendations and developments in medication compositions have led in changes in antihypertensive medicine prescription patterns throughout time. The availability of different antihypertensive medications provides clinicians with several possibilities for tailoring treatment[8].

As a result, the prescription pattern varies from patient to patient and from physician to physician. The rationale for this difference in prescribing patterns is a physician's conflict of interest[9]. Drug utilisation research is defined by the World Health Organisation (WHO) as "the marketing, distribution, prescription, and use of drugs in a society." with a particular emphasis on the medical, social, and economic ramifications"[10]. Thus, by definition, such studies provide a logical foundation for establishing the rationality of medication usage as well as evidence-based recommendations for policy decisions at various levels of healthcare[11]. Inpatient drug utilisation research studies are helpful methods for analysing prescription prescribing patterns, efficiency, and cost-effectiveness of hospital formularies. There is usually variance in medication use among nations and even within countries and occasionally within the same institute at various points in time, most likely due to changing illness patterns throughout time[12].

MATERIALS AND METHODS

Prospective observational research was conducted for a period of six months at outpatient and inpatient department of general medicine, orthopaedics, ENT in ESI hospital Ayanavaram, Chennai. During the study, all eligible participants were accepted based on inclusion criteria. Inclusion and exclusion criteria for the study were established. Prescriptions of 245 patients of either sex who have been diagnosed with hypertension as per JNC-8 guidelines and patients receiving or prescribed with antihypertensive medications were included.

Patients in emergency, life threatening medical or surgical conditions, pregnant and lactating women and patients with

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incomplete data were excluded. Patients who were seriously sick were excluded, as were those who were uninterested and did not give informed consent to participate in the study. After receiving clearance from the Institutional Ethics Committee (IEC), subjects were recruited for the study. The patient's sociodemographic profile, receiving or current prescribing patterns of antihypertensive medications were recorded in a predesigned data collection record form. Those receiving or with prescription of a one active principle medication was considered as monotherapy and those receiving or prescription of a more than one active principle medications were defined as a polytherapy.

The primary goal of the research was to evaluate the various classes of antihypertensive drugs in terms of diagnosis, and to conduct a drug utilisation review in hypertension with its various combinations. Patient demographics, antihypertensive medication type prescribed, blood pressure value were all noted. Frequency of drug prescription among different age groups, frequency of administration of individual drugs, frequency of prescribing combination drugs, frequency of prescribing fixed drug combinations, number of prescriptions per drug, number of drugs prescribed per total number of prescriptions were calculated.

STATISTICAL ANALYSIS

The Statistical Package for Social Sciences (SPSS for Windows) software was used to analyse the data, Version 21 of the programme. The percentage represents categorical data, whereas the standard deviation (SD) represents continuous data. The patient's information was and will be kept confidential and anonymous during and after the research.

RESULTS

Age distribution of patient

Table 1 shows that patients between the ages of 18 and 30 made up 2.0% of the patient population, while patients between the ages of 51 and 60 accounted for 34.9% of the total.

Table-1 : Distribution of age group

Age of group in years	No.of patients (n=	Percentage
18-30	5	2.0
31-40	37	15.1
41-50	76	31.0
51-60	86	34.9
>61	41	16.7

Table-2 : Distribution of gender

Gender	No of patients	Percentage
Male	132	53.8
Female	113	46.1

Gender distribution of patient

Table 2 shows that the male to female patient gender ratio is 1.1:1. 113 (46.1%) of the 245 patients were female, and 132 (53.8%) of the patients were male. A test of proportions revealed that there were a few more male patients than female ones.

Table -3: Duration of Hypertension

Duration in years	No. of patients	Percentage
<3 years	69	28.1
4-6 years	95	38.7
>7 years	81	33.0

Duration of hypertension

Table 3 reveals that 69 (28.1%) patients had histories of less than three years, 95 (38.7%) had histories of four to six years,

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and 81 (33.0%) had histories of more than seven years.

Table-4: Distribution of Systolic blood pressure

Systolic blood pressure (mmHg)	No. of patients	Percentage
110-139 (pre HTN)	74	30.2
140-159 (Stage 1 HTN)	71	28.9
160-179 (Stage 2 HTN)	83	33.8
>180 (HTN emergency)	17	6.9

Systolic blood pressure distribution in patients

Table 4 shows that 83 patients (33.8%) had significantly higher systolic blood pressure than normal, with values between 160 and 179 mmHg (Stage 2 HTN), while 6.9% of patients had emergency hypertension.

Table-5: Distribution of Diastolic blood pressure

Diastolic blood pressure (mmHg)	No. of patients	Percentage
<89 (pre HTN)	61	24.8
90-99 (Stage 1 HTN)	95	38.7
100-119 (Stage 2 HTN)	85	34.6
>120 (HTN emergency)	4	1.6

Diastolic blood pressure distribution of patients

Table 5's test of proportions revealed that 1.6% of patients had emergency hypertension while 95 (38.7%) of the patients had significantly higher diastolic blood pressure between 90 and 99 mmHg.

Table-6: Distribution of drug therapy

Drug Therapy	No. of patients	Percentage
Mono therapy	170	69.3
Dual therapy	47	19.1
Triple therapy	28	11.4

Drug therapy distribution among patients

The majority of patients, 170 (69.3%), were receiving monotherapy, which was much more common than dual therapy, and triple therapy, which were administered to 47 (19.1%), and 41 (11.4%) respectively.

Table-7: Utilization pattern of different antihypertensive drugs

Treatment	No. of patients use antihypertensive drugs	Percent
Monotherapy		
Calcium channel blocker	57	23.2
ARB	46	18.7
ACE Inhibitor	39	15.9
Beta Blocker	29	11.8
Diuretics	2	0.08

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Dual therapy		
CCB+ ARB	26	10.6
CCB+ Beta Blocker	21	8.5
Triple therapy		
CCB+ ARB+ ACE	18	7.3
CCB+ Beta Blocker+ ACE	10	4.0

Utilization pattern of different antihypertensive drugs

Calcium channel blockers (23.2%) were the most commonly utilised medication class for monotherapy in table 7. 10.6% of patients had dual medication therapies that included CCB+ARB, and 7.3% received triple drug therapies that included CCB+ARB+ACE

DISCUSSION

Drug utilisation studies, according to the WHO, are "the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences." Drug utilisation studies frequently use prescription pattern surveys as a methodological tool to gather detailed information about doctor prescribing practises and patient disease profiles. Worldwide, hypertension is a significant public health issue[13].

In this study, patients aged 18 to 30 made up the least percentage of the patient population (2.0%), while those aged 51 to 60 made up the largest percentage (34.9%), followed by those aged 41 to 50 (31.0%). In contrast, there were 245 patients in total, 132 (53.8%) of whom were men and 113 (46.1%) of whom were women (Table 2). A higher percentage of male patients may be due to elevated levels of androgens such testosterone, which are linked to blood pressure elevation. This study's findings are being supported by a study that Paradkar SG, et al. conducted that was comparable[14].

The current study found that single-drug therapy was used as a CCBs more frequently than multiple-drug therapy (69.3%). These findings corroborate the findings of Adake P et al.[15], who demonstrated that single-drug therapy could effectively reduce blood pressure. The patient's compliance, positive reaction, and low incidence of negative effects may be responsible for this. Similar to the findings of our investigation[16], CCBs were discovered to be the most commonly used class of medications in a study by Kale A et al. In our investigation, BBs were prescribed more frequently than CCBs, and the results are consistent with those of a study by Shah J PR et al.[17] that was conducted in an Indian tertiary care hospital.

In the current study, it was found that the prescribing pattern for antihypertensives had changed significantly, and that CCB, ARB, ACEI, and BB intake had significantly increased. These findings are consistent with other research[18]. The two antihypertensive medication classes that are most frequently prescribed are CCBs and ARBs. The more frequently prescribed ARBs and CCBs likely indicate that practitioners are better aware of the long-term benefits to the cardiovascular and renovascular systems. The prescriptions were also in line with the available data and recommendations because these drugs can lessen the likelihood that diabetic individuals may develop retinopathy, diabetic nephropathy, and other related issues. The dihydropyridine type of calcium channel blockers, such as Amlodipine, were the ones that were most frequently prescribed, with non-dihydropyridine type calcium channel blockers being far less frequently.

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According to the current observational study, patients with co-morbidities received one or two antihypertensive drugs in addition to other prescriptions to address their comorbid conditions, which included diabetes mellitus, IHD, CVA, and bronchial asthma. Amlodipine was the antihypertensive drug most frequently administered to older people in a study by Hussain IM et al[19]. This is also consistent with the JNC on Prevention, Detection, Evaluation, and Treatment of large Blood Pressure Guidelines' advice that modest doses of various antihypertensive medication classes are preferable to large doses of a single class[20].

Finally, this study's strength comes from its exceptional (6-month) duration of consideration. The bulk of earlier research had substantially smaller sample sizes and a relatively short time of consideration (often not longer than 3 months)[21].

This study's findings also provide a much more recent (and arguably more reliable) evaluation of the topic, and as such, it is hoped that they will attract attention as a refreshed, data-driven foundation for future research on the management and control of hypertension.

CONCLUSION

According to our study's examination of the drug use of antihypertensive drugs, the JNC 8 (the Eighth Report of the JNC on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure) guidelines were fully followed for the treatment of hypertension. Monotherapy was consistently more recommended in the early stages of hypertension in order to obtain the goal blood pressure, and calcium channel blockers were the preferred medicine for hypertensive patients.

This investigation led us to the conclusion that every prescription was rational, but more changes to the way antihypertensive drugs are provided to persons with high blood pressure are still required. Patients must adequately educate and counsel others about adverse drug reactions (ADRs) of drugs in order to improve life quality.

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