

A PROSPECTIVE ASSESSMENT ON ACHIEVEMENT OF TARGET BLOOD PRESSURE AMONG HYPERTENSIVE PATIENTS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: To evaluate target BP achievement in the hypertensive patients during the course of 2 months. **Methods:** This Prospective Observational study was performed on 223 eligible study participants. The blood pressure, co-morbidities and common drugs prescribed in hypertensive patients were noted and analyzed. **Results:** Among 260 patients, 230 met the inclusion criteria, and 223 came for follow-up whose data was recorded. It was found that the male population was more prone to hypertension, in the age group of 51-60 years. The mean systolic BP and diastolic BP of the study population were 127.8027 ± 18.293 and 79.77578 ± 12.47217 respectively. It was found

that 120 patients achieved the target BP on baseline were as 103 haven't, but on final visit (visit-2) 211 have achieved target BP and 12 haven't. Of the total number of the hypertensive patients DM was found to be most commonly occurred co-morbidity for 69 patients (30.49%). Out of 223 prescriptions beta-blockers (47.87 %) were found to be the most prescribed medication. **Conclusion:** The control of hypertension is an unavoidable component for the management of hypertensive patient. Anti-hypertensive treatment appears

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to be extremely useful in protecting the patient from other heart related complications. Even-though the awareness is quite high, attainment of target BP doesn't attain at the pinnacle which can be improved by effective counseling.

INTRODUCTION

Hypertension is the clinical condition where the systolic blood pressure is more than 140 mmHg and the diastolic blood pressure is more than 90 mmHg and are usually asymptotic.^[9,10] This is one of the highly prevalent risk factors, preferably a modifiable reason for end-organ damage which include stroke, cardiovascular disease, and chronic kidney disease which eventually perform as a precipitating factor for premature death and disability.^[1,2,4] and a major factor for the development of heart failure.^[7] Hypertension is normally accompanied with other cardiovascular disease risk factors and co-morbidities such as obesity, chronic kidney disease, diabetes mellitus,^[7,8] and heart disease. Thus, the status in management of patients with hypertension to achieve the target blood pressure levels depends on existence of co-morbidities among patients. In these patients early handling of hypertension to attain target blood pressure is particularly important in order to help reduce other CVD risk.^[6] Along with these patients with cardiovascular diseases shows an augmented risk of recurring stroke or myocardial infarction if BP is above recommended levels.^[4,5]

The Joint National Committee for the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure suggested that introducing medical management for lowering BP to attain a systolic blood pressure (SBP) target of 150 mmHg and a diastolic blood pressure (DBP) target of 90 mmHg for the general population aged ≥ 60 years, and SBP target of 140 mmHg and a DBP target of 90 mmHg for people aged 60 years of age.^[2,3,7] Management tactics for the recovery from hypertension include lifestyle modification along with antihypertensive drug therapy.^[1] The American Heart Association (AHA) guidelines addressed the role of management of blood cholesterol, overweight and obesity in the general population along with lifestyle modification for treatment of patients with increased cardiovascular risk.^[7,8] these guidelines should be considered during the management of BP. The major pharmacological management which is involved in the management of hypertension are angiotensin converting enzyme inhibitors, angiotensin receptor blocker, calcium channel blocker, beta blockers, diuretics. The efficiency of these drugs will vary from one to another.^[7] The management of hypertension is available in single pill or on

combination therapy. The dual combination or the triple combination are proved to be effective for achieving the desired target BP.^[5,6]

The major factor which plays a very important role for development of uncontrolled BP may be elderly age, lengthier period with hypertension, smoking, lack of compliance and uncontrolled DM. Economic burden seems to be a leading reason for the high prevalence of hypertension.^[1] All these interferences are on the edge of modifiable factors which can be controlled. To improve BP control of patients and medical professionals especially pharmacists must pay their responsibility of delivering medical education by proper counselling of patients especially in the field of existing pharmacotherapy and educate them on fact that more strict control of BP is required to reduce severe complications of diabetes and hypertension.^[8] Achievement of control of blood pressure and avoidance of adverse drug reactions can, be achieved by appropriate drug selection and dosage, and also by the determination of spectrum of pharmacological actions of the different compounds in reducing blood pressure.^[9,10] and through ADR monitoring through pharmacovigilance (PV),^[11] and continuous monitoring of patients.^[12]

OBJECTIVES OF THE STUDY

The objectives of the study were

To evaluate the patient's target blood pressure achievement using JNC-8 guidelines.

Inclusion Criteria

1. Both male and female patients who have hypertension
2. Those patients aged between 30 to 80 years of age
3. Those patients who are undergoing treatment with anti-hypertensive drugs
4. Patients who are hemodynamically stable

Exclusion Criteria

1. Allergy or intolerance patients to any of the anti-hypertensive drugs
2. Those patients who have previous history of ADR to anti-hypertensive drugs
3. Patients below 30 years and above 80 years of age
4. Liver and renal failure patients/ renal artery stenosis
5. Pregnant and lactating mothers
6. History of malignancy
7. Those patients with an electrolyte abnormality

8. Hypotensive patients and thyroid disorders

MATERIALS AND METHOD

Study design and Sample

The study was performed in the cardiology department of Vivekanandha Medical Care Hospital (VMCH), Tiruchengode, under the guidance of Dr. S.P. Santhosh Kumar, M.D., (GEN MED). DNB (CARDIO) [Interventional Cardiologist]. Approval from the Ethics Committee and consent from the enrolled patients were obtained before of the study.

Design of Study

Prospective Observational Study.

Sample Size

223 patients.

Study Duration

October- December (2 months).

Data Collection and Measurement

Patient attended cardiology or general medical OPD satisfying the above medical criteria were selected for the study. About 223 patients were enrolled for the study. Each of these patients were analysed for the achievement of Target BP. The enrolled patients were tested for all parameters including BP, weight, pulse, SPO₂, temperature and social history. All the external data for our study include patient case records, designed data entry form, imaging study report which include USG abdomen, medication chart, lab report of each of the patients for the analysis of Hb, RFT, LFT and also details from patient and patient's care taker. All the patients came for second follow-up as well as third follow-up during the study period. The baseline blood pressure was documented for all the 223 patients, following first and second follow up values.

Statistical Tools

The collected data was tabulated using Microsoft Excel 2010 and analysed using Graph Pad Prism 9. The variables were summarised by Mean, Standard Deviation, Chi square test, 'p'-values. The 'p'- values of Chi- square test were observed and applied for the analysis of target blood pressure (TBP). The 'p'-value less than 0.05 was considered to be significant the comparative charts were using the MS Excel 2010 version

RESULT

1. Gender Wise Distribution

Figure 1 and **table 1** imply the total number of male and female population of the study. Out of 223 patients, 150 were male and 73 female who completed the full course of study.

Table 1: Gender wise distribution.

Gender	Number of patient	Percentage
MALE	150	67.27 %
FEMALE	73	32.73 %

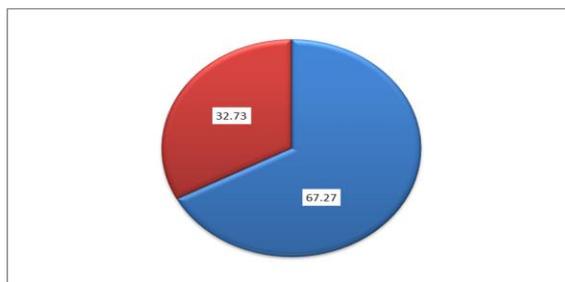


Figure 1: Gender wise distribution.

2. Age Wise Distribution

Figure 2 and **Table 2** imply the total number of male and female population in different age groups of the study.

Table 2: Age wise distribution.

Age group	Number of patients	Percentage
31-40	20	8.97 %
41-50	42	18.83 %
51-60	78	34.18 %
61-70	43	19.29 %
71-80	40	17.93 %

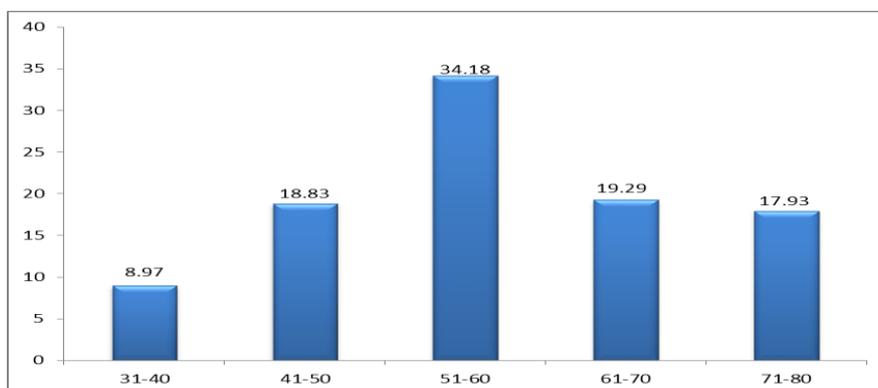


Figure 2: Age wise distribution.

3. Gender Wise Distribution Among Age Groups

Gender wise distributions among different age groups were illustrated in **Table 3** and the graph for the same in **Figure 3**.

Table 3: Gender wise distribution among age groups.

S.NO	Age in years	No of patients		Percentage	
		Male	Female	Male	Female
1	31-40	13	7	65 %	35 %
2	41-50	27	15	64.29 %	35.71 %
3	51-60	52	26	66.67 %	33.33 %
4	61-70	28	15	65.11 %	34.89 %
5	71-80	26	14	65 %	35 %

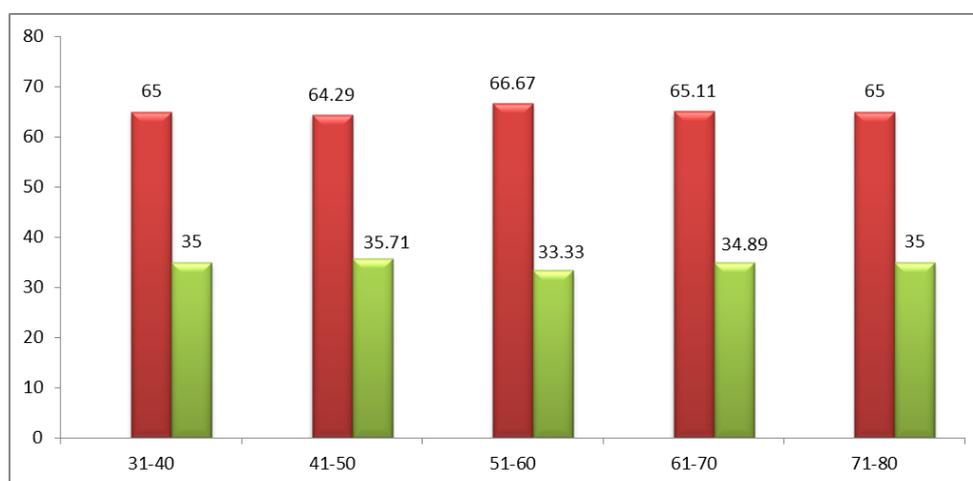


Figure 3: Gender wise distribution among age groups.

4. Categorization Based on Achievement of Target Blood Pressure

Figure 4 and **Table 4** shows the mean systolic blood pressure and diastolic blood pressure of the study population.

Table 4: Target Blood Pressure.

Blood Pressure	Mean \pm Standard deviation
Systolic BP	127.8027 \pm 18.293
Diastolic BP	79.77578 \pm 12.47217

Table 4.1: Categorization Based on Achievement of Target Blood Pressure.

	Achieved TBP	Not achieved TBP
BASELINE	120	103
VISIT- 1	172	51
VISIT- 2	211	12

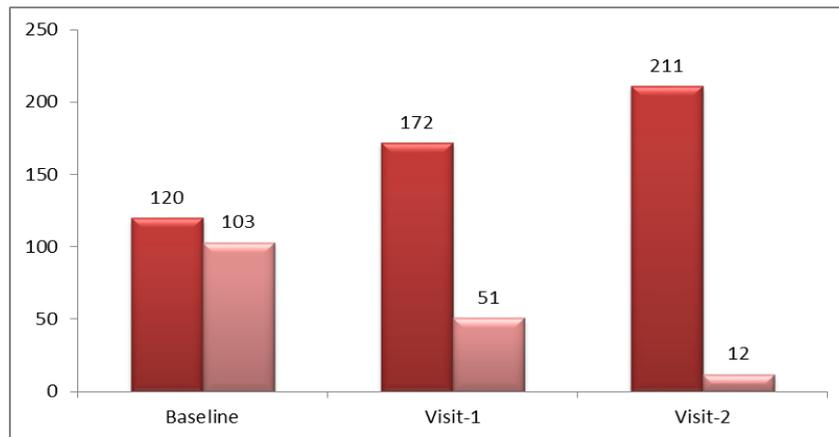


Figure 4: Categorization Based On Achievement of Target Blood Pressure.

5. Association of Co-Morbidities

Figure 5 and Table 5 illustrate the association of hypertension with the other co-morbidities. Of the total number of 223 patients 30.49 % (69 patients) were in association with DM along with hypertension and found to be the highest among other comorbidities.

Table 5: Comorbidities.

MEDICAL HISTORY	PERCENTAGE (%)
Diabetes Mellitus	30.49 %
Hyperlipidemia	23.31 %
Myocardial Infarction	20.62 %
LV Dysfunction	20.17 %
Acute Coronary Syndrome	11.21 %
Angina	10.76 %
Heart Failure	10.31 %
Ischemic Heart Disease	6.37 %
Peripheral Artery Disease	4.93 %
Chronic Obstructive Pulmonary Disease	3.58 %
Dilated Cardiomyopathy	3.13 %

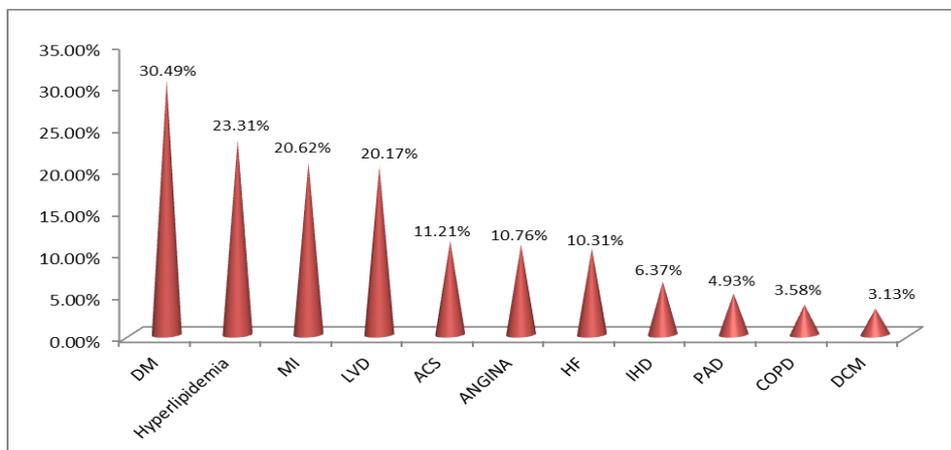


Figure 5: Comorbidities.

6. Common Classes of Drug Prescribed

Figure 6 and Table 6 represent the common classes of drug prescribed in the OP. In a total of 223 prescription beta blockers were prescribed the most 47.85 % (106), and α - blocker the least (3.13%)

Table 6: Common Classes of Drug Prescribed.

DRUGS	PERCENTAGE
Beta blockers	47.85 %
Anti-platelet	42.15 %
Anti-hyperlipidemic	30.94 %
Oral hypoglycemic agents	30.49 %
Angiotensin receptor blocker	29.59 %
Anti-coagulant	20.62 %
Diuretics	16.59 %
Anti-anginal	13.9 %
Vasodilators	12.1 %
Calcium channel blocker	12.1 %
Insulin	4.93 %
Angiotensin Converting Enzyme Inhibitors	4.03 %
Alpha blocker	3.13 %

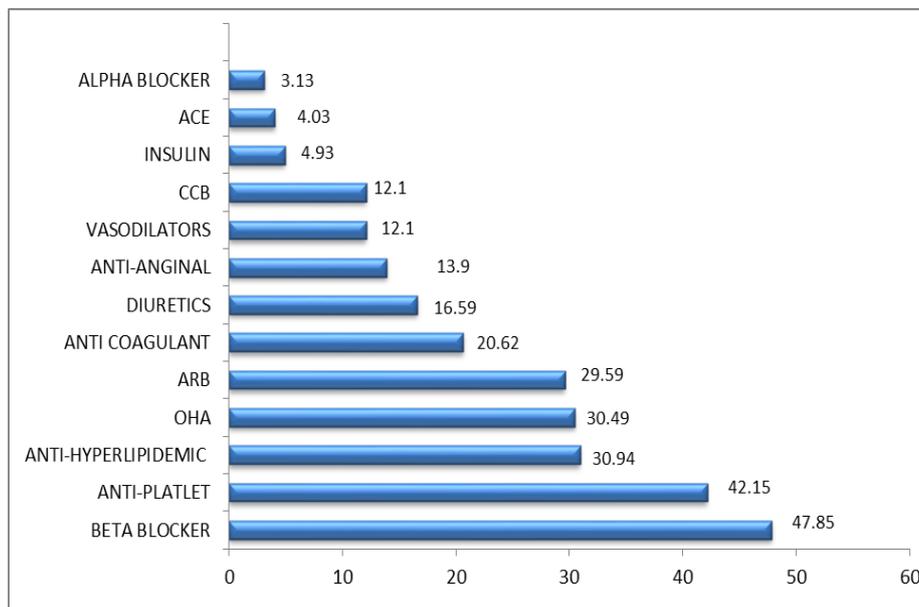


Figure 6: Common Classes of Drug Prescribed.

7. Prescription Pattern Of Anti Hypertensive Drugs

Figure 7 and Table 7 illustrate the prescription pattern of anti-hypertensive drugs among 223 patients. Out of these beta blocker prescribed (47.85%) the most and alpha blocker is prescribed least.

Table 7: Prescription pattern of Anti-hypertensive drugs.

DRUGS	PERCENTAGE
Beta blocker	47.85 %
ARB	29.59 %
Diuretics	16.59 %
ACEI	12.1 %
CCB	4.93 %
Alpha blocker	3.13 %

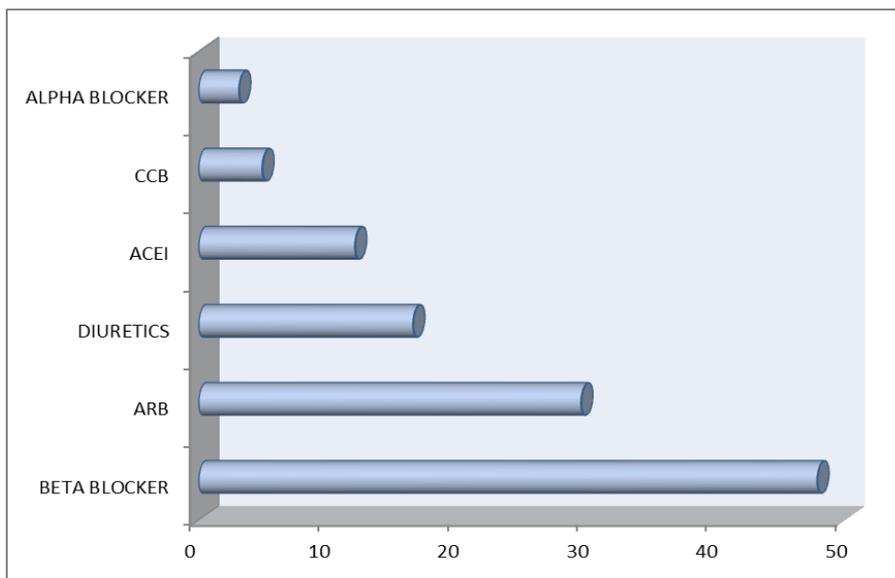


Figure 7: Prescription pattern of Anti-hypertensive drugs.

8. Socio Demographic Factors Assessment

Figure 8.1 Table 8.1 implies the correlation of socio demographic factors among hypertensive patients.

Table 8.1: Socio Demographic Factors Assessment.

SMOKING	ALCOHOL
51.79 %	40.28 %

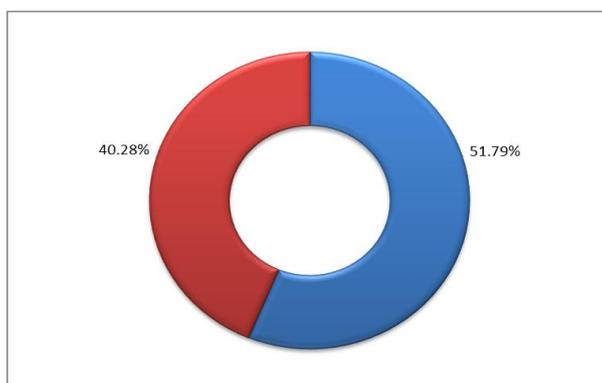


Figure 8.1: Socio Demographic Factors Assessment.

8.2 Another Socio-Demographic Factor based on the Pattern of food intake illustrated in Table 8.2 and Figure 8.2.

Table 8.2: Based on food intake.

Non vegetarians	18.38%
Vegetarians	81.16%

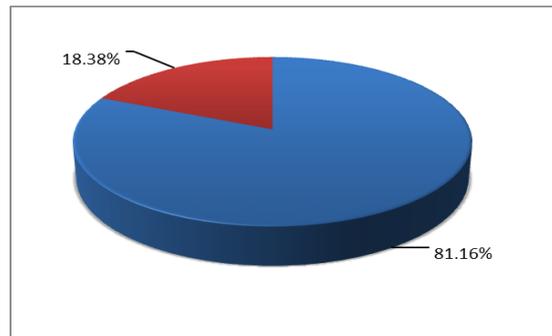


Figure 8.2: Based on food intake

DISCUSSION

Through this study we aimed to report the achievement of target BP among the out patients in Cardiology / General medicine department. As a part of the study we also analyzed specific risk factors of hypertensive patients. We have found that almost 94.61% of the study population achieved the target BP according to JNC 8 guidelines. Saide Aytekin et al conducted a study in a103 site and showed the same observed result of accomplishment in the study.

The study showed that the risk of development of development of hypertension among male patient is more than female. Bethany Everett et al. shows the same observation of risk of development of hypertension is more among male patients than in female.

The study also assessed the vulnerable age group for the development of hypertension and concluded by observing that an age group of 51 to 60 followingly the age group of 60 to 70 is more prone for the development. Cheryl D. Fryar, M.S.P.H., conducted the study in 2015 to 2016 and observed that an age of greater than 60 is more vulnerable to development of hypertension.

The study showed that the association of hypertension among other cardiac problem. Another study conducted among the Lebanese population by Aline Milane et al., shows that there occurs a clear association between hypertension and CAD.

The socio-demographic assessment among these patients were also analysed history among patient is observed in our study. The association of hypertension with diabetes mellitus, smoking has reported earlier on numerous research occasions (13-17).

The study also analysed the common classes of drugs prescribed for the patients and observed that the beta blockers where mostly prescribed. Another study conducted by Charles S Wiyosonge et al conducted a study on Beta blockers for hypertension and obtained similar.

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