

Study of Prescriptive Patterns of Antihypertensive Drugs in South India

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ABSTRACT:

The current study aimed to provide incite in to the prescriptive patterns of antihypertensive drugs in a south Indian super-specialty hospital. This prospective study was conducted in multi specialty hospital in southern Indian state of Andhra Pradesh from June 2012 to September 2012. Data was obtained from a prospective series of 205 patients of either sex by scrutinizing the outpatient cards and laboratory reports of inpatients attending the hospital. The data collected were analyzed for prescribing patterns of antihypertensive drugs and demographic profiles of the patients suffering from hypertension. The results were analyzed and tabulated statistically by student's t test. P value <0.05* is considered. The present study revealed that calcium channel blockers were the drugs of choice for hypertensive patients as a single drug therapy and overall utilization. Utilization of diuretics in the present study was 5.1% as mono therapy which is lesser even though they are available at lower cost. The study showed that a higher percentage of patients (56.09%) were found to be on dual therapy and among them 73(63.4%) were found to be treated with fixed dose combination i. e ARB+ Diuretic followed by beta blockers +CCBs and the reduction of SBP and DBP was found to be significant with these combinations and the pattern is according to JNC guidelines. The study revealed that the prescription of antihypertensive medication is according to JNC guidelines, except monotherapy of diuretics.

1 INTRODUCTION:

Essential hypertension is one of the most important major modifiable risk factors for cardiovascular disease even though there is a considerable advancement in understanding the pathophysiology and availability of effective treatment strategies [1]. It is estimated that 972 million adults were affected by hypertension worldwide, with 66% of those affected were from low and middle income countries. It is estimated that by the year 2025 the world wide prevalence of hypertension would increase to 29.2% from 26.4% in 2000 [2] Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India.

Pharmacological management of hypertension includes usage of drugs like diuretics, beta-blockers, ACE-inhibitors, calcium channel blockers etc.

The current study aims at study of antihypertensive drug utilization pattern in a south Indian super specialty hospital to evaluate factors related to the prescribing, dispensing, administering and taking of medication, and its associated events (either beneficial or adverse). In the beginning, these studies were used only for marketing purposes and later started for evaluating the quality of medical prescription and comparing patterns of use of specific drugs.

[3]

2 METHODOLOGY:

2.2 Place of study:

This prospective study was conducted at Rohini hospital, Hanamkonda, Warangal, Andhra Pradesh from June 2012 to September 2012. Data was obtained from a prospective series of 205 patients of either sex by scrutinizing the outpatient cards and laboratory reports of inpatients attending the hospital. The protocol was prepared as per JNC-VII [11] guidelines.

2.3 Inclusion criteria:

The data is collected from all the patients of either sex with primary hypertension in medicine outpatient and inpatient departments who are willing to participate in the study.

2.4 Exclusion criteria:

Patients below the age of 18 years, Female patients who were pregnant, Patients who are not willing to participate in the study and Patients with secondary hypertension were excluded from study.

2.5 Study procedure:

Data for present study were collected by scrutinizing the patient's case reports, outpatient and inpatient cards. The data collected were analyzed for prescribing patterns of antihypertensive drugs and demographic profiles of the patients suffering from hypertension.

The patients enrolled in the study were grouped based on the type and number of antihypertensive drugs prescribed. The data collected was analyzed for demographic profile of the patients and prescribing patterns of anti hypertensive drugs in these patients.

2.6 Statistical analysis:

The results were analyzed and tabulated statistically by student's t test. P value $<0.05^*$ is considered.

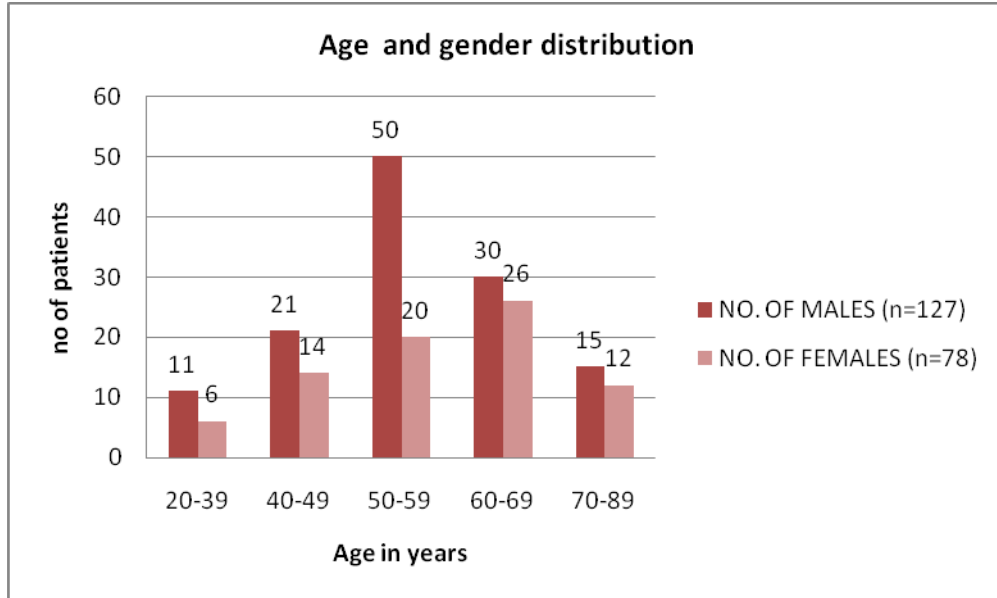
3 RESULTS AND DISCUSSION:

A prospective study was carried out with an objective "to study prescriptive pattern of drugs in a south Indian super-specialty hospital" at Rohini super-specialty hospital, Hanamkonda. During the study period all the patients suffering from hypertension who visited the medicine outpatient department and patients admitted in to inpatient wards were included in the study. Patients with secondary hypertension, pregnancy and below 18 years were excluded a total number of 205 patients fulfilling the inclusion criteria were recruited for the present study. Patient data was collected from outpatient cards and inpatient cards of the patients recruited for the study. The data collected was analyzed for demographic profile of the patients and prescribing patterns of anti hypertensive drugs in the treatment of these patients.

3.1 Age and gender distribution:

Figure 1 shows the gender distribution of the patients recruited for the present study. The results reveal that out of 205 patients recruited for the present study, 127 (61.95%) were males and 78(38.04%) were females and maximum number of patients were in the age group of 50-59(34.14%) , followed by age group 60-69(27.31%) and 17.07% of patients in the age group of 40-49 years. Careful literature review reveals that there is no consistency in the gender distribution of the patients suffering from hypertension. While some of the studies have reported higher percentage of the patients are male patients [4] and some studies have reported lower percentage of them are male patients [5]. In case of age group many studies reported that higher percentage of patients were found in the age group of 51-60 years [6]

Figure1: Age and gender distribution:

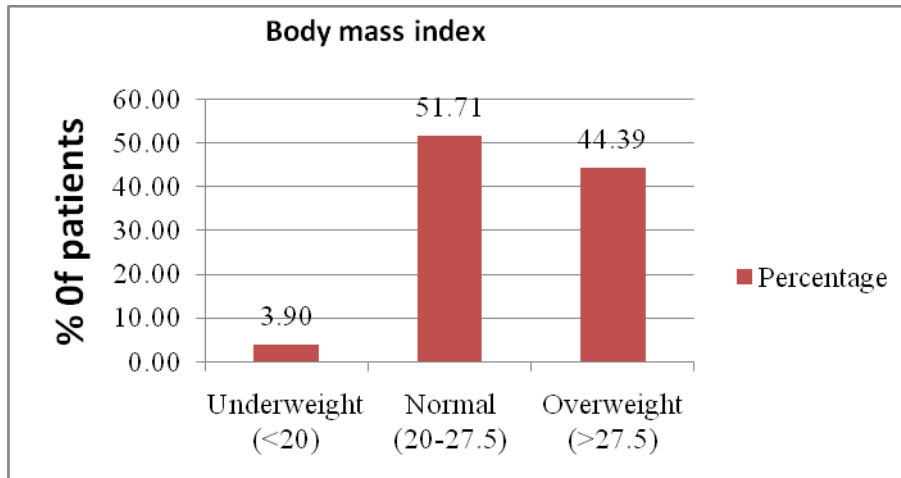


The results shown in the above table reveal that hypertension is more prevalent among males (61.95%) and maximum number of patients among the age group 50-59 yrs (39.37%).

3.2 Body mass index:

Distribution of the patients in different weight groups during the present study is shown in figure 2. The results revealed that in the present study 106 (51.07%) were of normal weight, 91(44.39%) were of overweight and 8 (3.90%) were of underweight. Careful literature review reveals that there is no consistency or positive correlation existing between BP and increasing BMI in the patients [7]

Figure 2: Body mass index:

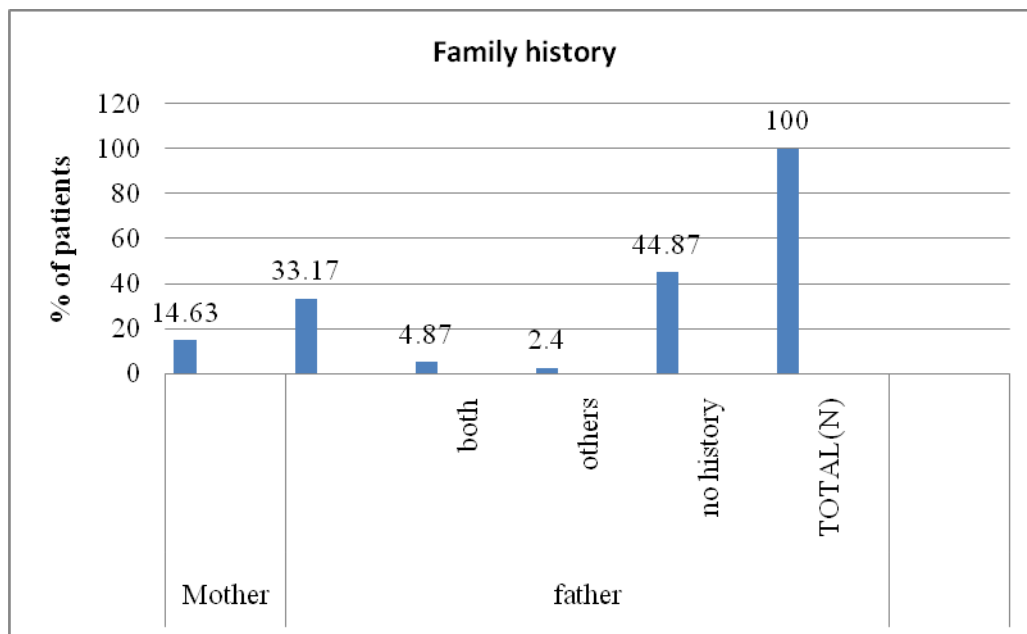


The results shown in the above table show that 106 patients (51.70%) were of normal weight, 91 patients (44.39%) were of overweight and 8 patients (3.9%) were of underweight.

3.3 Family history:

Family history of the patients with hypertension recruited in the present study is shown in Figure 3. It was observed in the present study that 68 (33.17%), of the patients had a family history of father having hypertension 30 (14.63%) of the patients had a family history of mother having hypertension and 5 (2.4%) of the patients had a family history of other family members having hypertension. Only 10 (4.87%) of patients had a family history of both father and mother having hypertension. 92 (44.87%) had no history of hypertension. A total of 108 (52%) of patients having a family history of hypertension reinforces the fact that there is a strong genetic predisposition in hypertension.

Figure 3: Family history:



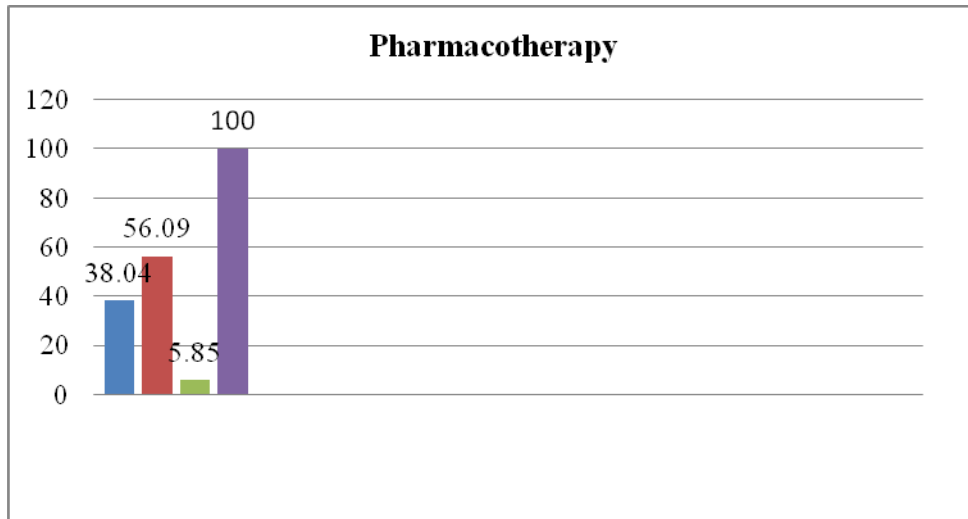
The results in the above table show that maximum number of patients are having family history of either father having BP(33.17%) or mother having BP(14.63%) or both(4.87%).

3.4 Pharmacotherapy:

For the purpose of analyzing the prescriptive patterns of antihypertensive drugs in the treatment of hypertension the pharmacotherapy was classified as monotherapy, dual therapy and multiple therapies, where single antihypertensive, two antihypertensives and more than two antihypertensives respectively were used for the treatment. Table 4 shows the number of patients who underwent treatment under different groups.

The results revealed that, maximum number of patients 115(56.09%) underwent dual therapy followed by 78 (38.04%) underwent monotherapy and 12 (5.85%) were found to take more than 2 drugs (3 drugs). It was also observed that in dual therapy and multiple therapy most of the prescribed drugs are fixed dose combinations. The higher choice of fixed dose combination products offer a potential means of reducing pill burden and cost for the patient convenience and compliance[8] (Figure 4)

Figure 4: Pharmacotherapy

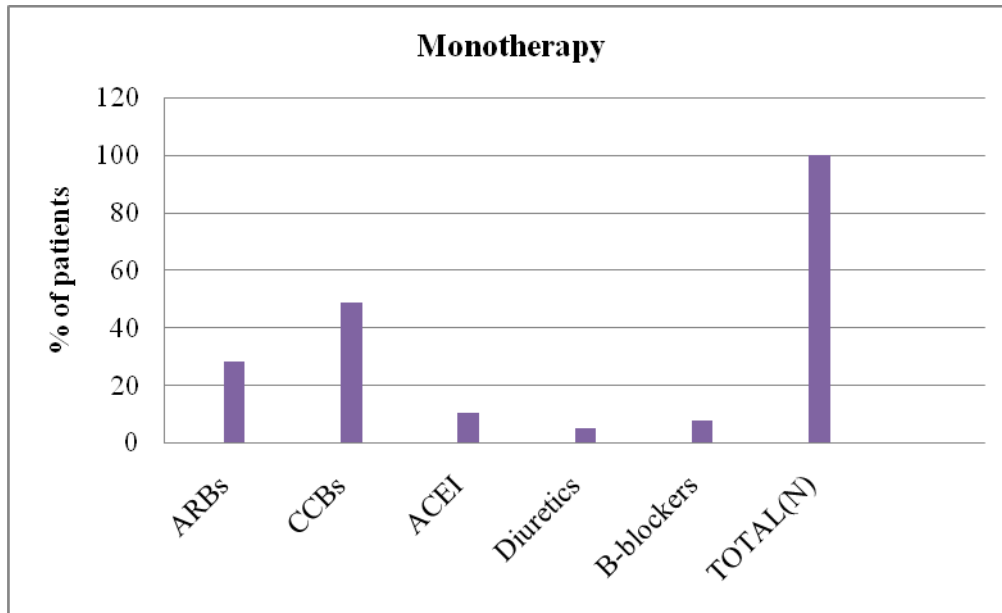


The results shown in the above table reveal that maximum patients underwent dual therapy (56.09%).

3.5 Monotherapy:

The various antihypertensive drugs and the number of patients in whom they were used under the class of monotherapy are shown in the figure 5. The results revealed that, out of 205 patients who underwent antihypertensive therapy, 78(38.04%) were found to be on monotherapy. Among 78 patients, 38 (48.7%) were found to be treated with CCBs, followed by 22 (28.2%) were treated with ARBs, 8(10.25%) of patients with ACE inhibitors, 6(7.69%) of patients with beta blockers, 4(5.12%) of the patients with diuretics. The study showed the higher usage of calcium channel blockers as single drug in monotherapy followed by ARBs and ACEIs. [9]

Figure 5: Monotherapy:

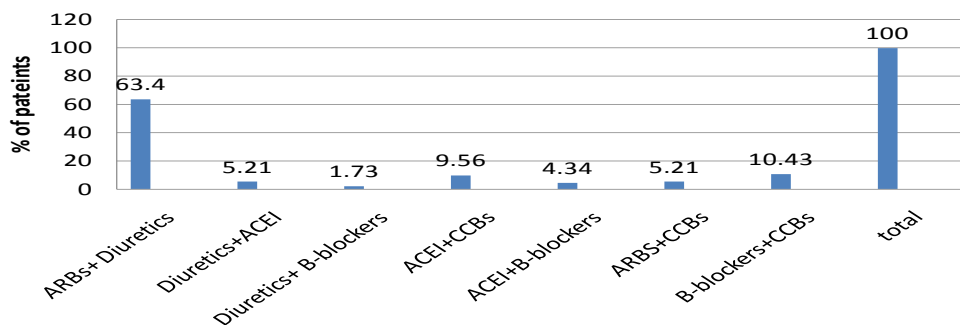


The results shown in the above table show that CCBs are the mostly prescribed drugs in monotherapy (48.7%) followed by ARBs (28,2%).

3.6 Dual therapy:

Figure 6 results revealed that among 115 patients given dual therapy, 73(63.4%) of the patients were found to be treated with a fixed dose combination ARB+ Diuretic followed by β -blocker+ CCBs *i.e* 10.43%. Earlier studies showed that diuretics and ACEIs are the mostly used drugs. [10]

Figure 6: Dual therapy:

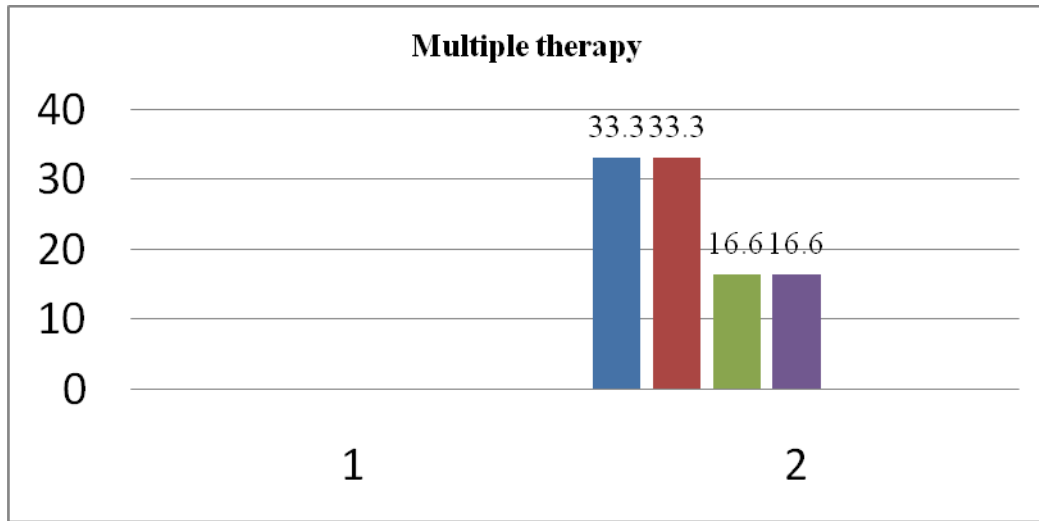


The results in the above table reveal that ARBs+ Diuretics are the mostly prescribed combination of drugs (63.4%) in dual therapy.

3.7 Monotherapy vs. combination therapy:

In comparing the systolic and diastolic blood pressures before and after treatments in monotherapy, Figure 7 and 8 results revealed that significant reduction in systolic blood pressure was observed in patients treated with ARBs and CCBs and figure 9 results revealed that significant reduction in diastolic blood pressure was observed in patients treated with ARBs. figure 10 results revealed that in combination therapy significant reduction of systolic blood pressure was observed in patients treated with combinations of Diuretics+ARBs, Diuretics+ACEIs, Diuretics+ β -blockers, ACEIs+CCBs, ARBs+ β -blockers and table 11 results revealed that significant reduction of diastolic blood pressure was observed in patients treated with combination of Diuretics+ β -blockers, ACEIs+CCBs, ARBs+ β -blockers ($P < 0.05$).

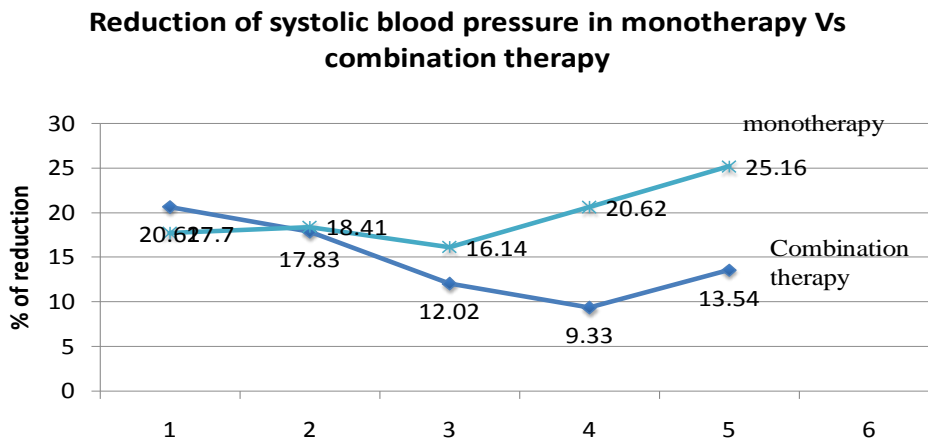
Figure 7: Multiple therapy



The results in the above table reveal that multiple therapy was given only among 12 patients with Diuretics+ARBs+CCBs being the mostly prescribed combination (33.3%).

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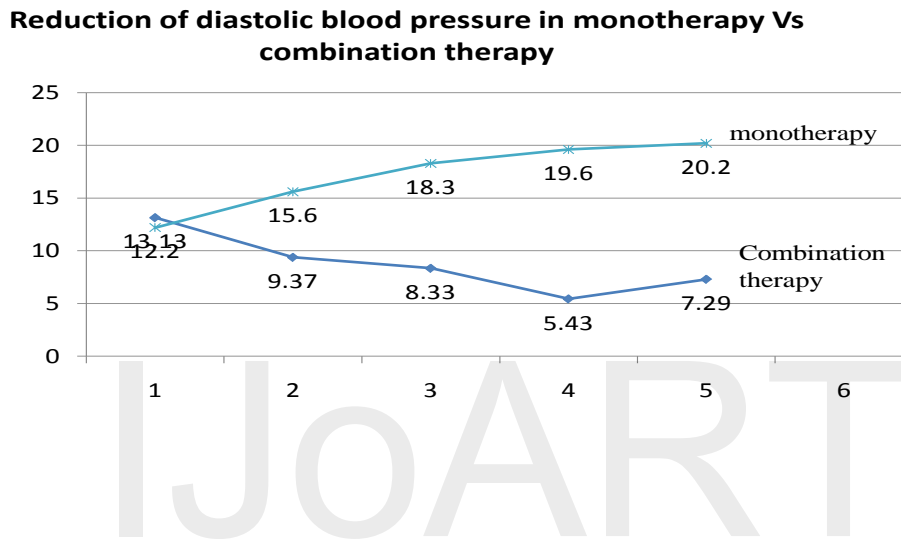
Figure 8



The results in the above table reveal that single co-morbid condition was found among 47.31%, multiple co-morbid condition 16.09% of patients and 36.58% of them were fund

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Figure 9



3.8 Co-morbidities:

Figure 12 shows details of co-morbidities associated with hypertension. The results revealed that out of 205 patients included in the study, 97 (47.31%) patients had single co-morbid condition and 33 (16.09%) patients had multiple co-morbidities whereas 75 (36.58%) patients had no co-morbid condition.

Details of single co-morbid conditions are shown in figure 13. Out of 97 patients with single co-morbidity, 60(61.85%) of the patients had Diabetes Mellitus followed by IHD in 12(12.37%) patients.

Details of multiple co-morbid conditions are shown in the figure 14. The results revealed that out of 33 patients with multiple co-morbidities, maximum number of patients had DM and COPD followed by DM and anemia.

Results revealed that Diabetes Mellitus was found to be the most prevalent co-morbid condition accompanying hypertension (61.85%) and among the patients with coexisting diabetes, ACEIs are found to be mostly prescribed class of drugs (50.6%) , along with a combination of diuretic or a CCB.

Figure 10

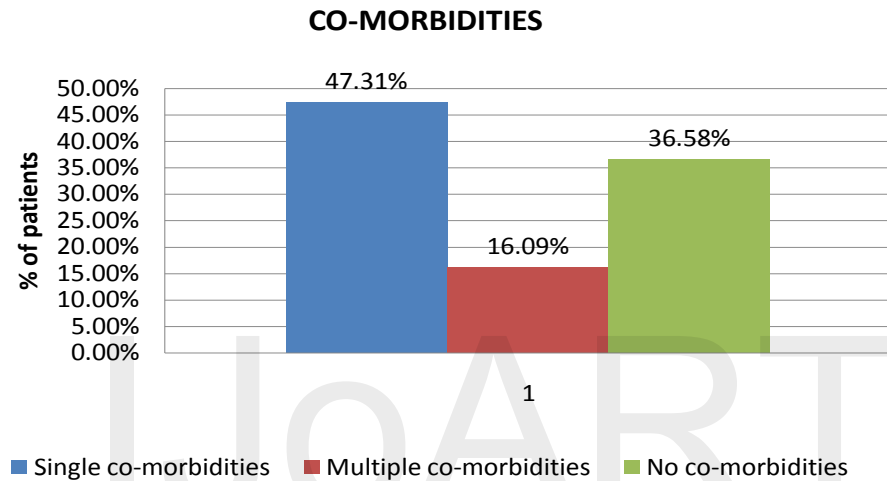


Figure 11

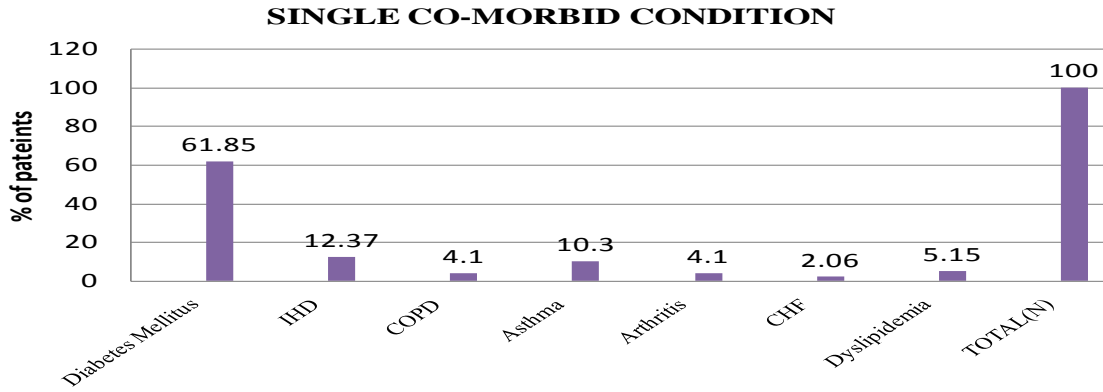


Figure 12

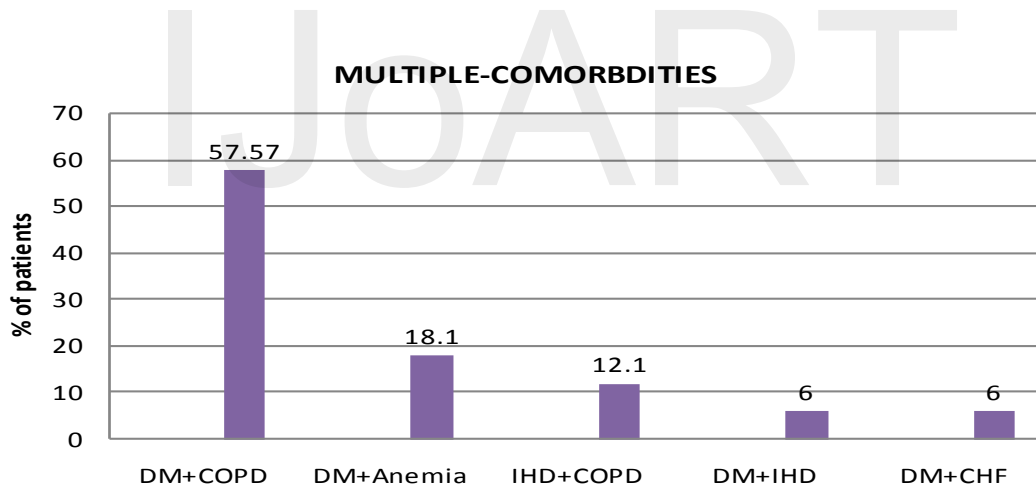
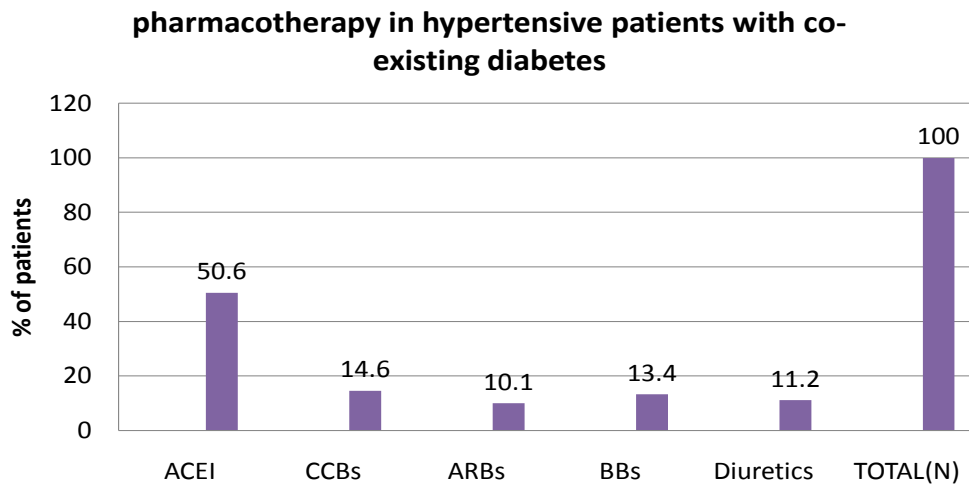


Figure 13

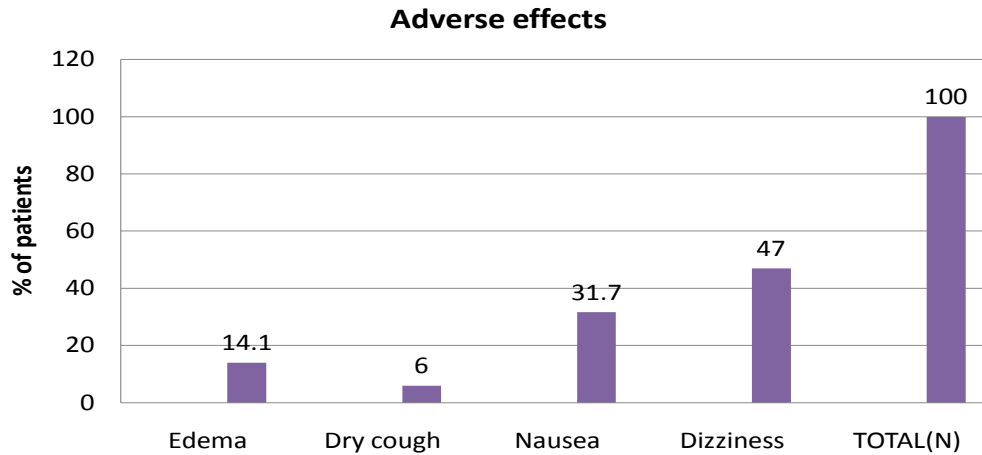


The results in the above figure reveal that in hypertensive patients with co-existing diabetes ACEIs are the mostly prescribed class of anti-hypertensives (50.6%).

3.9 Adverse effects:

Among 205 patients recruited for the present study 85 patients (44.46%) reported to have adverse effects. 47.05% members reported to have dizziness, followed by nausea (31.76%), edema (14.1%) and dry cough (7%).

Figure 15



The results in the above figure reveal that among 205 patients recruited for the study 85 patients reported to have adverse effects.

4 CONCLUSION:

As there is a strong epidemic rise in hypertension in our country, the present prospective study was carried out to assess the current trends in prescribing patterns of antihypertensive drugs in the treatment of hypertension in the medical inpatient and outpatient departments of Rohini Hospital, Hanamkonda.

Algorithm for the treatment of hypertension suggests the use of a single agent at the initiation of the therapy and then an agent of different mechanism of action should be administered when satisfactory control cannot be achieved with an increased dose of the drugs prescribed. Hence, the present study was carried out with the main objective of analyzing the prescribing patterns of the antihypertensive drugs in the management of hypertension.

The present study revealed that calcium channel blockers were the drugs of choice for hypertensive patients as a single drug therapy and overall utilization.

Diuretics are generally recommended as first-line therapy for treatment of hypertension [11] (JNC V; JNC VI). Utilization of diuretics in the present study was 5.1% as mono therapy which is lesser even though they are available at lower cost.

But in combination therapy diuretics are being utilized in combination with angiotensin receptor blocker (63.4%) and the pattern supports JNC6 and JNC7 guidelines as diuretics play a very important role in adequate reduction of BP by reducing blood volume and vascular resistance.

Considerable use of two drug combinations (56.09%) in comparison to use of 3 drugs and more suggest that physicians are considerably aware of not using too many drugs that may effect the patient compliance and adherence to drug therapy.

The study showed that a higher percentage of patients (56.09%) were found to be on dual therapy and among them 73(63.4%) were found to be treated with fixed dose combination *i.e* ARB+ Diuretic followed by beta blockers +CCBs and the reduction of SBP and DBP was found to be significant with these combinations and the pattern is according to JNC guidelines.

The study also showed that ACEIs were the most important class of drugs in patients with coexisting diabetes which is a rational approach as ACEIs cause lesser side effects in diabetic patients with hypertension

The under use of diuretics in monotherapy is the most important drawback of the present prescribing pattern as they are available at lower cost.

From the present study it was concluded that DM is the most prevalent co-morbid condition in patients reporting single co-morbidity (61.85%) and DM+COPD (57.57%) are the mostly prevalent co-morbidities in patients reporting multiple comorbidities.

From the present study it can be concluded that there is a strong genetic predisposition in development of essential hypertension because most of the patients reported to have a family history of either father having hypertension, or mother having hypertension or both.

From the present study it was concluded that dizziness is the mostly encountered adverse effect (47%) during antihypertensive usage followed by nausea (31.7%) and edema.

5 REFERENCES:

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