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Analysis Of Effective Anti-Hypertensive Combination Therapy Out Of Angiotensin Receptor Blocker With Calcium Channel Blocker Versus Angiotensin Receptor Blocker With Diuretics In Newly Diagnosed Hypertensive Patients In A Tertiary Care Hospital

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Abstract

Background:
Developing Countries have undergone rapid industrialization, urbanization, globalization and economic development over the last four decades. Therefore, standard of living has improved but with a detrimental shift toward inappropriate dietary patterns and reduction in physical activities. This health transition will ultimately affect the health of young adults with people in reproductive age group of present generation. Prevalence of Hypertension in India ranges from 17% to 29.8%. Cardiovascular diseases are the leading cause of death globally, accounting for approximately 31% of all global deaths. Increased blood pressure is one of the important risk factors of cardiovascular disease. According to the WHO's World Health Statistics Report 2012, 21% world's adult population has raised blood pressure – a condition responsible for half of all deaths from stroke and heart disease. Hypertension contributes to 4.5 percent of the current global disease burden. The prevalence of hypertension among young adults is on a steady rise

Objective: Analysis of effective Anti-Hypertensive Combination therapy out of Angiotensin Receptor Blocker with Calcium Channel Blocker Versus Angiotensin Receptor Blocker with Diuretics in newly diagnosed hypertensive patients in a Tertiary Care Hospital

Material &Methods: a prospective observational randomized control study from sep-2021 to Feb-2022, after obtaining the necessary clearance from the institutional Ethical Committee. We included those, who attended the medicine outpatient department with a diagnosis of newly diagnosed essential hypertension of 18 to 50 year of age and excluded those with secondary hypertension

Result &Discussion:

Out of 60 hypertensive patients under evaluation 42 were males (70%) with an M: F ratio of 2.3:1. In ARBs + CCBs (Group A) there are 23 male patients (76.67%) and 7 females (23.33%), while in ARBs + Diuretics (Group B) there are 19 males (63.33%) and 11 females (36.67%)

Conclusion:

Through this study we conclude that ARBs + CCBs (Group A) drug combination is more effective than ARBs + Diuretics (Group B) drug combination in reducing the blood pressure

Keywords: Calcium channel blocker, Angiotensin receptor, Antihypertensive, Diuretics

INTRODUCTION

Developing Countries have undergone rapid industrialization, urbanization, globalizationandeconomicdevelopmentoverthelast fourdecades. Therefore,standard of living has improved but with a detrimental shift toward inappropriate dietarypatterns andeducation inphysicalactivities.

Thishealthtransitionwillultimately affect the health of young adults with people in reproductive age group ofpresent generation. Prevalence of Hypertension in India ranges from 17% to 29.8%. Cardiovavascular diseases are the leading cause of deathglobally,accounting forapproximately 31% of all global deaths. Increased blood pressure is one of theimportant risk factors of cardiovascular disease. According to the WHO's WorldHealthStatisticsReport2012,21%world'sadu ltpopulation has raisedbloodpressure–a conditionresponsibleforhalfof all deaths from stroke and heart disease. Hypertension contributes to 4.5 percent of the current global disease burden. The prevalence of hypertension among young adults is on a steady rise. This may be attributed by severalfactorssuch as changed lifestyle andeducationpattern thatleads to stress. Over 80% of cardiovascular deaths in developing countries are due tolack of widespread diagnosis and treatment at early stage as compared to developedcountries. India as developing countries face a dual burden of communicable andnon-communicable diseases with shifting trend including hypertension, stroke andcoronaryartery**disease** **(1)**.

The primary aim of this study is to analyze a effective anti-hypertensive combination out of angiotensin receptor blockers with calcium channel blockers andangiotensin receptor blockers with diuretics.

Thefollowingguidelines are generallyfollowedforstudying hypertension: -

1. AmericanHeartAssociation(AHA)2017
2. European SocietyofCardiology(ESC)2018
3. IndianMedicalAssociation(IMA)2017

Out of these, we have followed ESC guidelines for the study purpose in thisproject.

For FDC therapies the 2018 ESC/ESH Guidelines for the management ofarterial hypertension are designed for adults with hypertension, i.e. aged ≥18 years isfollowed and for BP JNC 7 2003 is followed.

These2018ESC/ESHGuidelinesforthemanagement ofarterialhypertensionare designed for adults with hypertension, i.e. aged ≥18 years. The purpose of thereview and update of these Guidelines was to evaluate and incorporate new evidence into the Guideline recommendations. The specific aims of these Guidelines were toproduce pragmatic recommendationstoimprovethedetectionandtreatm entofhypertension, and to **improve the poor rates of BP control by promoting simple andeffective treatment strategies**[(2)].

MATERIALSANDMETHODS

We conducted a prospective observational randomized control study-6 Months, afterobtaining thenecessaryclearacnefromtheinstitutionalEthicalC ommittee.Weincludedthose,whoattendedthe medicine outpatient department with a diagnosis of newly diagnosed essential hypertension of18to 50year ofageandexcluded thosewith secondaryhypertension.

Patientswhofulfilledtheinclusioncriteriaweresubjec tedtoapresentquestionnaire after obtaining a written informed consent. The questionnaire includedbasic data,socio-economic factors,medicationdetails,complications and reasonsfornon-adherence to medication.

The data thus obtained was tabulated and analyzed using Statistical Package for Social Sciences 16 (SPSS version 16)

StudyDesign: Observational Study.
StudyDuration: Sep-2021 to Feb-2022(Periodofpatientenrolment) Afterthat3 months follow-up.
StudyCenter: CardiologyDepartment, NSHG, Gurgurgam.

Inclusion Criteria:

1. AllCardiacOPDpatients(population)withfirstti mediagnosis of hypertension.
2. Patientbetweenagesof18-50years.
3. Patientofeithersex.

Exclusion Criteria:

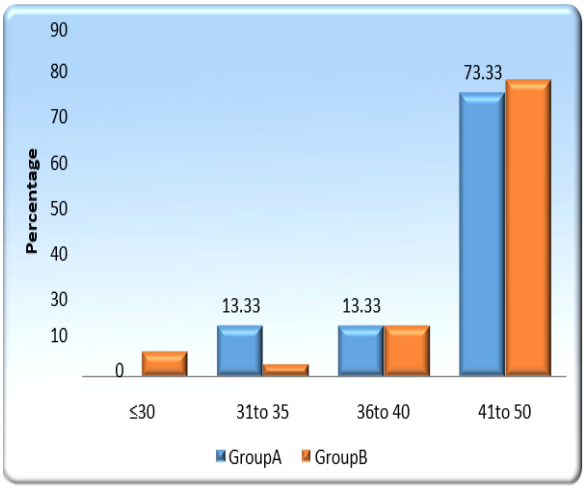
1. Patients<18yearsofage
2. Pregnant and lactating women
3. CKD(chronickidneydiseaseStage III-V, patientswither<60)
4. Patientwith incomplete medical record
5. Secondaryhypertension
6. Metabolicsyndrome
7. Patientsexperiencingahypertensiveeme-rgency,havingaknowncontraindicatedtoanyofth e studydrugs.

OBSERVATIONSANDRESULTS

Table1: Agewisedistribution of thecases amongthegroups

Age Group(inyears)	Group A		Group B		Grand Total	
	No	%	No	%	No	%
≤30	0	0.00	2	6.67	2	3.33
31 to 35	4	13.33	1	3.33	5	8.33
36 to 40	4	13.33	4	13.33	8	13.33
41 to 50	22	73.33	23	76.67	45	75
Total	30	100.00	30	100.00	60	100
Mean±S.D.	44.80±5.76		45.23±6.76		45.02±6.23	

Chi-square=0.714 with1 degreeoffreedom; P=0.398NS



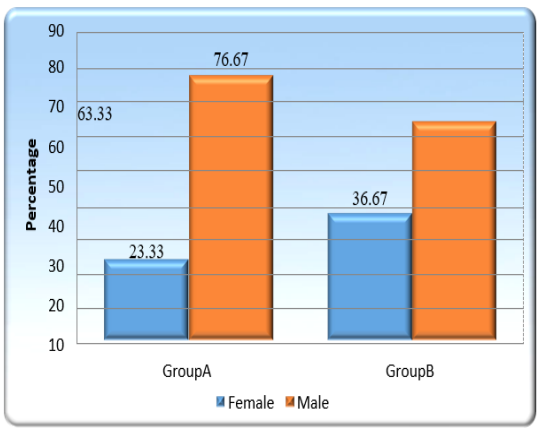
Graph1: AgeStatistics

Table2depictstheagestatisticsinboththegroups.Itinc ludesthedistribution of patients in different age groups. There is no significance difference intheageamongboth thegroups.
Mostofthepatients lie inthe age groupof41-50.

Table2: Genderwise distributionof thecasesamongthegroups

Gender	GroupA		GroupB		Grand Total	
	No	%	No	%	No	%
Female	7	23.33	11	36.67	18	30
Male	23	76.67	19	63.33	42	70
Total	30	100.00	30	100.00	60	100

Chi-square=0.714 with1 degreeoffreedom; P=0.398NS

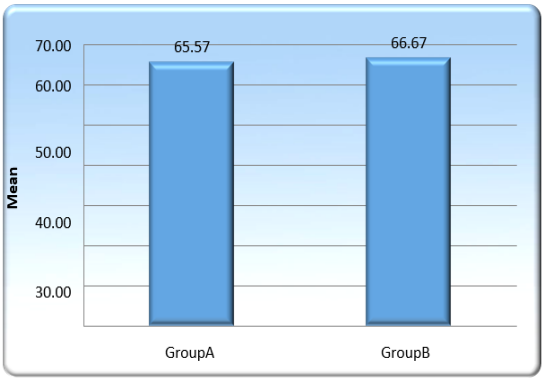


Graph2: GenderStatistics

Table3depictsthegenderdistributionofpatientsinbothgroups.Genderdistributionis non-significant asindicatedfrom Pvalue.
In Group A, out of total 30 patients there are 7 females and 23 males.InGroupB,outof total30 patientsthereare11femalesand19 males.

Table3: MeanWeightofthecaseamongthegroups

Group	N	Mean Weight (in kg)	Std.Deviation	P value
GroupA	30	65.57	7.44	0.55NS
GroupB	30	66.67	6.79	
Total	60	66.12	7.08	



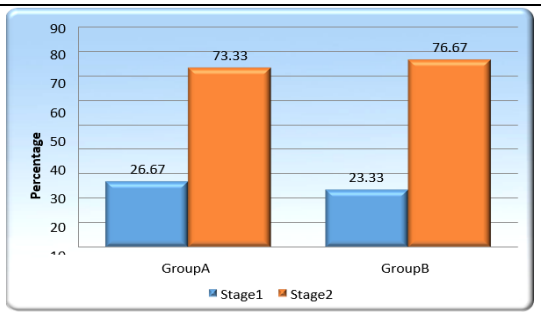
Graph3: MeanWeightStatistics

Table3depictsthemeanweightobservedin boththe groupswithanaverageweightof65.57 kg± 7.44 in Group Aand 66.77kg± 6.79in GroupB

Table4: Distributionofthecasesamongthegroupsaccordingtohypertensionstagesat baseline

Stage	GroupA		GroupB		GrandTotal	
	No	%	No	%	No	%
Stage1	8	26.67	7	23.33	15	25
Stage2	22	73.33	23	76.67	45	75
Total	30	100.00	30	100.00	60	100

Chi-square=0.000 with1 degreeof freedom;P=1.000NS



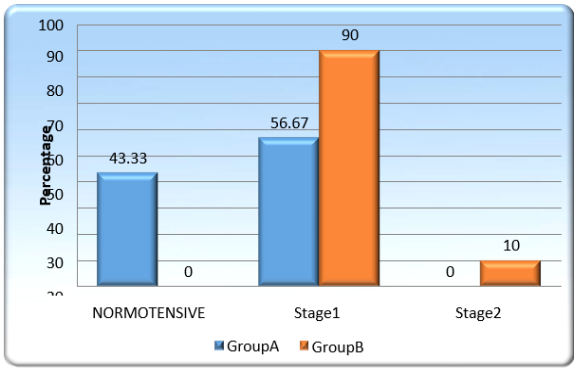
Graph4: StageofHTN atBaselineVisit

As indicated from Table 5, the Stage wise distribution of patients in both thegroupsis not significant baselinevisit.
In group A, 8 patients fall under stage I and 22 under stage II while in groupB,7 patients areunder stageIand 23 under stageII.

Table5: Distribution of the cases among the groups according to hypertension stage sa1st followup

Stage	GroupA		GroupB		GrandTotal	
	No	%	No	%	No	%
Normotensive	13	43.33	0	0.00	13	21.67
Stage1	17	56.67	27	90.00	44	73.33
Stage2	0	0.00	3	10.00	3	5.00
Total	30	100.00	30	100.00	60	100.00

Chi-square=18.273 with2degrees offreedom;P=0.0001S



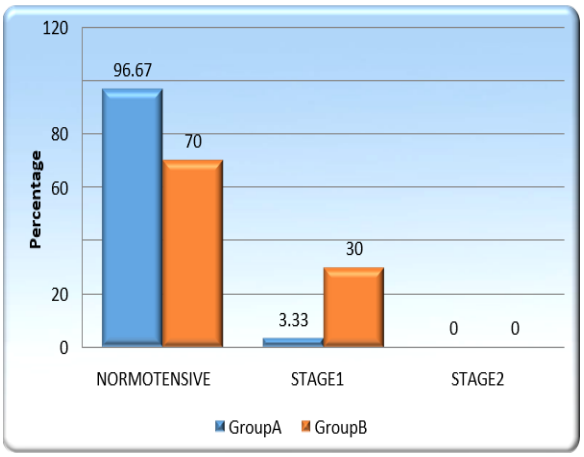
Graph5: StageofHTN atFollow-Up 1 Visit

As indicated from Table 6, the Stage wise distribution of patients in both thegroupsis significant atFollow-up 1 visit.
IngroupA, afterreceivingthetreatment13patientswereunderNormotensivestage,17 in StageIand 0inStageII.
In group B, after receiving the treatment 0 patients were under Normotensive27 in StageIand 3inStageII.

Table6: Distributionofthecasesamongthegroupsaccordingtohypertensionstagesat 2nd followup

Stage	GroupA		GroupB		GrandTotal	
	No	%	No	%	No	%
Normotensive	29	96.67	21	70.00	50	83.33
Stage1	1	3.33	9	30.00	10	16.67
Stage2	0	0.00	0	0.00	0	0.00
Total	30	100.00	30	100.00	60	100.00

Chi-square=5.880 with1 degreeof freedom;P=0.015S

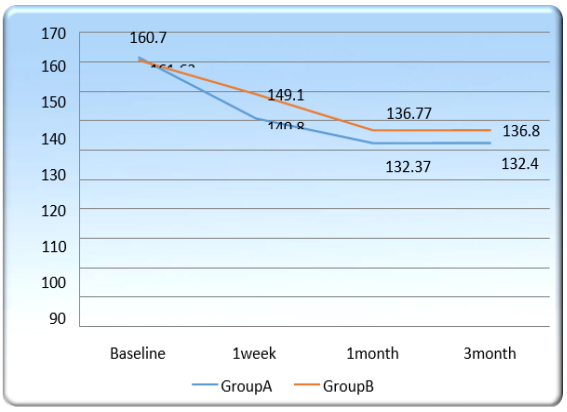


Graph6: StageofHTNatFollow-Up2 Visit

As indicated from Table 7, the Stage wise distribution of patients in both thegroupsis significant atFollow-up 2 visit.
IngroupA,afterreceivingthetreatment29patientswereunderNormotensivestage,1 in StageIand 0 in Stage II.
IngroupB,afterreceivingthetreatment21patientswereunderNormotensivestage,9inStageIand0inStageII.

Tableno7: SBPamongthegroupsat allvisits

Group		Baseline	1week	1month	3month
GroupA	N	30	30	30	30
	Mean	161.63	140.8	132.37	132.47
	Std.Deviation	10.55	5.88	2.82	2.77
GroupB	N	30	30	30	30
	Mean	160.7	149.1	136.77	136.8
	Std.Deviation	9.27	7.48	5.33	3.71
Total	N	60	60	60	60
	Mean	161.17	144.95	134.57	134.63
	Std.Deviation	9.85	7.87	4.778	3.91
P value		0.717NS	<0.001S	<0.001S	<0.001S

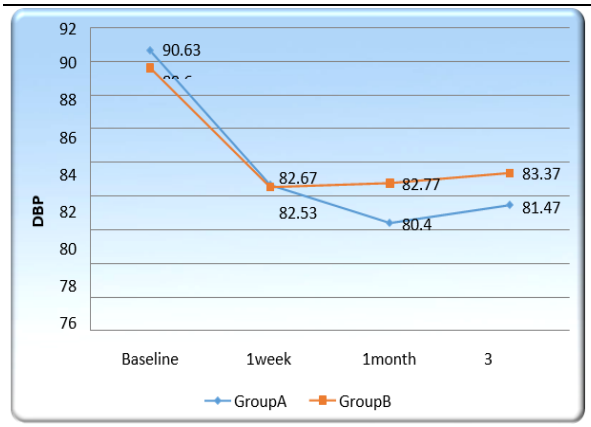


Graph7: MeanSBPat differentvisits

Atinitialvisit, the meanSBPasobservedfromdatais161.63mmofHg±10.55in groupAand160.7 mm ofHg±9.27 ingroup B.
Atfollow-up1visit,themeanSBPasobservedfromdatais140.8 mmofHg±5.88 ingroupAand149.1 mmof Hg±7.48 ingroup B.
At follow-up 2 visit, the mean SBPasobserved fromdata is132.37 mm ofHg± 2.77 ingroupAand 136.77 mmof Hg± 5.33 in groupB.
At follow-up 3 visit, the mean SBPasobserved fromdata is132.47 mm ofHg± 10.55 ingroupAand 136.8 mmofHg± 3.71in groupB.

Table8:DBPamong thegroups at allvisits

Group		Baseline	1week	1month	3month
GroupA	N	30	30	30	30
	Mean	90.63	82.67	80.40	81.47
	Std.Deviation	8.78	3.45	1.16	1.57
GroupB	N	30	30	30	30
	Mean	89.60	82.53	82.77	83.37
	Std.Deviation	9.31	3.83	2.45	2.38
Total	N	60	60	60	60
	Mean	90.12	82.60	81.58	82.42
	Std.Deviation	8.99	3.62	2.25	2.21
P value		.660NS	.888NS	<0.001S	<.001S

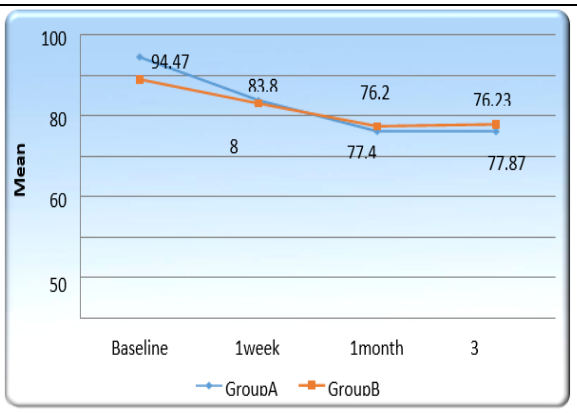


Graph8: Mean DBP at different visits

Atinitialvisit,themeanDBPasobservedfromdatais90.63mmofHg±8.78ingroupA and89.6mmofHg±9.31 ingroupB.
Atfollow-up1visit,themeanDBPasobservedfromdatais82.67 mmofHg± 3.45 ingroupAand82.53 mm of Hg± 3.83in groupB.
Atfollow-up2visit, the meanDBPasobservedfromdatais80.40mmofHg± 1.16 ingroupAand82.77 mm of Hg± 2.45in groupB.
Atfollow-up3visit,themeanDBPasobservedfromdatais81.47 mmofHg± 1.57 ingroupAand83.37 mm of Hg± 2.38in groupB
.

Table9: Pulse amongthe groupsatallvisits

Group		Baseline	1week	1month	3month
GroupA	N	30	30	30	30
	Mean	94.47	83.80	76.20	76.23
	Std.Deviation	11.53	6.38	2.73	3.02
GroupB	N	30	30	30	30
	Mean	88.97	83.00	77.40	77.87
	Std.Deviation	10.34	7.07	3.93	3.73
Total	N	60	60	60	60
	Mean	91.72	83.40	76.80	77.05
	Std.Deviation	11.21	6.69	3.41	3.46
P Value		.057NS	.647NS	.175NS	.068NS

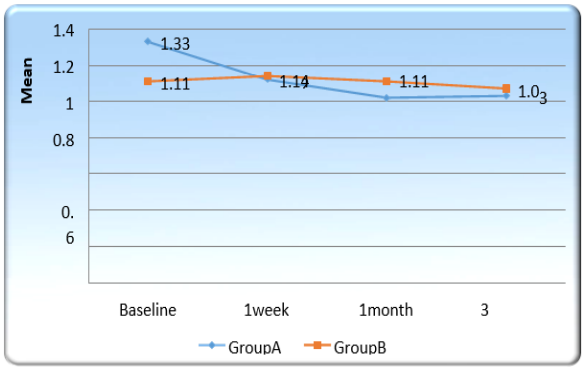


Graph9: Mean Pulse at allvisits

Atinitialvisit,themeanPulseasobservedfromdatais94.47perminute±11.53in groupAand88.97 perminute±10.34 in group B.
Atfollow-up1visit,themeanPulseasobservedfromdatais83.80 perminute± 6.38 in groupAand 83.00 per minute±7.07 in groupB.
Atfollow-up2visit,themeanPulseasobservedfromdatais76.20 perminute± 2.73 in groupAand 77.40 per minute±3.93 in groupB.
Atfollow-up3visit,themeanPulseasobservedfromdatais76.23 perminute± 3.02 in groupAand 77.87 per minute±3.73 in groupB.

Table10: Mean SerumCreatinine amongthegroupsat all visits

Group		Baseline	1week	1month	3month
GroupA	N	30	30	30	30
	Mean	1.33	1.12	1.02	1.03
	Std.Deviation	.46	.34	.16	.16
GroupB	N	30	30	30	30
	Mean	1.11	1.14	1.11	1.07
	Std.Deviation	.34	.33	.32	.30
Total	N	60	60	60	60
	Mean	1.22	1.13	1.07	1.05
	Std.Deviation	.42	.34	.26	.24
P Value		.043S	.874NS	.181NS	.541NS

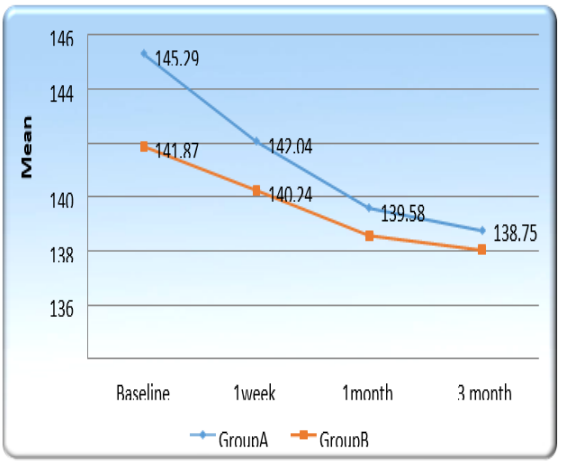


Graph10: MeanSerumCreatinineatallvisits

At initial visit,themeanSerumCreatinineasobservedfromdata is1.33mg/dL± 0.46 in group Aand 1.11 mg/dL± 0.34 in groupB.
Atfollow-up1visit, themeanSerumCreatinineasobservedfromdatais1.12mg/dL± 0.34 in group A and1.14 mg/dL± 0.33 in groupB.
Atfollow-up2visit,themeanSerumCreatinineasobservedfromdataismg/dL± 0.16 in group A and 1.11mg/dL± 0.32 in groupB.
Atfollow-up3visit,themeanSerumCreatinineasobservedfromdataismg/dL± 0.16 in group A and 1.07mg/dL± 0.30 in groupB

Table11: Serumsodiumlevel among thegroupsat all visits

Group		Baseline	1week	1month	3month
Group A	N	30	30	30	30
	Mean	145.29	142.04	139.58	138.75
	Std.Deviation	6.93	4.72	4.44	4.43
Group B	N	30	30	30	30
	Mean	141.87	140.24	138.57	138.03
	Std.Deviation	7.57	5.74	4.76	4.67
Total	N	60	60	60	60
	Mean	143.58	141.14	139.08	138.39
	Std.Deviation	7.40	5.29	4.60	4.52
P Value		.074NS	.180NS	.400NS	.542NS

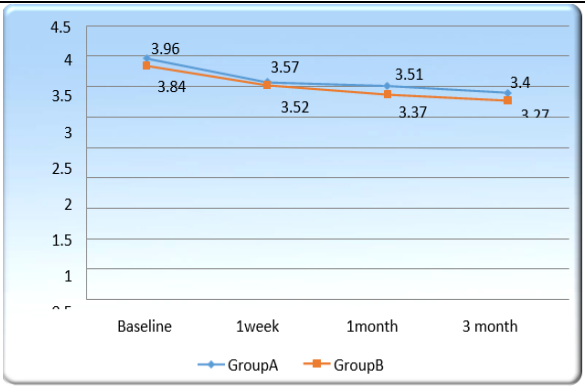


Graph11: Serumsodiumlevel at allvisits

Atinitialvisit, the meanSerumSodiumlevel asobservedfromdatais145.29mEq/L± 6.93 in group A and 141.87 mEq/L±7.57 ingroupB.
Atfollow-up1visit, the meanSerumSodiumlevelasobservedfromdatais142.04mEq/L± 4.72 in group A and 140.24 mEq/L±5.74 ingroupB.
Atfollow-up2visit,themeanSerumSodiumlevelasobservedfromdatais139.58mEq/L± 4.44 in group A and 138.57 mEq/L±4.76 ingroupB.
Atfollow-up3visit,themeanSerumSodiumlevelasobservedfromdatais138.75mEq/L± 4.43 in group A and 138.03 mEq/L±4.67 ingroupB.

Table12: SerumPotassiumlevel amongthegroupsat all visits

Group		Baseline	1week	1month	3month
GroupA	N	30	30	30	30
	Mean	3.96	3.57	3.51	3.40
	Std.Deviation	.49	.51	.40	.33
GroupB	N	30	30	30	30
	Mean	3.84	3.52	3.37	3.27
	Std.Deviation	.59	.37	.42	.47
Total	N	60	60	60	60
	Mean	3.90	3.55	3.44	3.34
	Std.Deviation	.54	.44	.41	.41
P Value		.408NS	.637NS	.215NS	.239NS



Graph12: Serumpotassiumlevel at allvisits

Atinitialvisit,themeanSerumPotassiumlevelasobservedfromdatais3.96 mEq/L± 0.49in group A and 3.84 mEq/L±0.59 in groupB.
Atfollow-up1visit,themeanSerumPotassiumlevelasobservedfromdatais3.57 mEq/L± 0.51 ingroup A and 3.52 mEq/L ±0.37 in groupB.
Atfollow-up2visit, themeanSerumPotassiumlevelasobservedfromdatais3.51 mEq/L± 0.40 ingroup A and 3.37 mEq/L ±0.42 in groupB.
Atfollow-up3visit,themeanSerumPotassiumlevelasobservedfromdatais3.40 mEq/L± 0.33 ingroup A and 3.27 mEq/L ±0.47 in groupB.

Table13:MMAS-8AdherenceScoresatfollow upvisits

	1week				1month				3month			
	GroupA		GroupB		GroupA		GroupB		GroupA		GroupB	
Adherence	N	%	N	%	N	%	N	%	N	%	N	%
25%	3	10.00	3	10.00	3	10.00	2	6.67	2	6.67	2	6.67
37.5%	3	10.00	3	10.00	1	3.33	2	6.67	2	6.67	2	6.67
50%	0	0.00	0	0.00	5	16.67	3	10.00	3	10.00	3	10.00
62.5%	5	16.67	5	16.67	2	6.67	3	10.00	3	10.00	3	10.00
75%	4	13.33	4	13.33	4	13.33	8	26.67	8	26.67	8	26.67
87.5%	10	33.33	10	33.33	10	33.33	12	40.00	12	40.00	12	40.00
100%	5	16.67	5	16.67	5	16.67	0	0.00	0	0.00	0	0.00
Total	30	100	30	100	30	100	30	100	30	100	30	100
P value	1.0NS				0.25NS				1.0NS			

Theabovetabledepictsthedataforadherenceof

patientstothemedicationasperMMAS-8 scale filled on the follow-up visits.

DISCUSSION

Out of 60 hypertensive patients under evaluation 42 were males (70%) withan M: F ratio of 2.3:1. In ARBs +CCBs (Group A)there are 23 male patients(76.67%) and 7 females(23.33%), while in ARBs + Diuretics(Group B)there are19 males (63.33%) and 11 females (36.67%).Data was calculated using Chi squareandPvaluewas0.398whichwasstatisticallyinsignificant.**(Table 1&Table2).**
This was similar to earlier studies by SubashPandaya et al [3] and Wang, Zainahet$_{al.}$ (4)
This was similar to earlier studies by SubashPandaya et al [3]and Wang, Zainahet al. [4]
Majority of the hypertensive patients in either sex was in the 41-50 years agegroup.Chis Quarewasusedtocalculatenon-numericaldataofagegroupclassificationand the P value come outto be 0.398 which is non-significant. Weight of patients was taken into consideration for determining drug dosestrengthforadultsandthemeanweightinARBs+CCBs(GroupA)is65.57kgs±7.44andforARBs+Diuretics(GroupB)is66.67kgs±6.79.Thedataisstatistically non-significant (P value - 0.55)**(Table 3)** This was similar to earlierstudiesbySubashPandayaetal[3]and Wang, Zainahet al. [4]
As per the guidelines for BP in JNC-7, the cases are distributed into differentstageof HTN.
At initial visits, there are 8 patients (26.67%) for stage I and 22 (73.33%) forstageIIinARBs+CCBs(GroupA)groupand7patients(23.33%)forstageIand23 (76.67%) for stage II in ARBs + Diuretics (Group B) group. The data is non-significant(P value – 1.000) which is clinicallyrelevant **(Table4).**
After a weekwhenthepatientcame for Follow-up1visit,there wasavariation in stages of HTN due to drug administration. In ARBs + CCBs, (Group A)13patients(43.33%)areundernormotensivestage, 17(56.67%)inStageIandnopatients are left as Stage II hypertensive. While in ARBs + Diuretics (Group B) nopatients come out to be normotensive, 27 (90%) in Stage I and 3 (10%) still as stageII hypertensive. P value was >0.0001 which is statistically significant. **(Table 5).**This was similar to earlier studies by Jalap Suthar et al [30] and Uttam Kumar, OmPrakashSharma et al[1]
Atfollow-up2visitafteramonth,29patients(96.67%)arenormotensiveand 1 (3.33%) is stage I HTN in ARBs + CCBs (Group A) group and 21 patients(70%) are

normotensive and 9 (30%) in stage I in ARBs + Diuretics (Group B)group.Thedatawasfoundtobestatistically significantwithPvalue>0.0001.**(Table6).**

Mean SBP was observed for every visit and was studied for change in BPwiththeusageof drugsand passageof time.

InARBs+CCBs(GroupA)meanSBPwasobservedas 161.63mmofHg±10.55at initial visit, 140.8 mm of Hg±5.88 at follow-up visit 1, 132.37 mm ofHg±2.82at follow-up visit 2, and132.47 mm of Hg±2.77 at follow-up visit 3.

InARBs+Diuretics(GroupB)meanSBPwasobserve das160.7mmofHg±9.27atinitialvisit,149.1mmofH g±7.48atfollow-upvisit1,136.77mmofHg±5.33 at follow-up visit 2,and 136.8 mm of Hg±3.71 at follow-up visit3.

When the data was analyzed statistically, all the data except for the initialvisit came out to be significant. There was statistically significant reduction in BP inboththegroupsat1st week(Pvalue<0.001),1st month (Pvalue<.001)and3rd month(P value <.001)dueto effectof anti-hypertensive drugs. **(Table 7).**

Mean DBP was observed for every visit and was studied for change in BP. InARBs+ CCBs (Group A) mean DBP was observed as 90.63 mm of Hg ± 8.78 atinitial visit, 82.67 mm of Hg ± 3.45 at follow-up visit 1, 80.40 mm of Hg ± 1.16 atfollow-upvisit 2, and 81.47 mm of Hg± 2.38 atfollow-up visit 3

In ARBs+ Diuretics(GroupB) meanDBPwasobserved as89.6 mmofHg ±9.31atinitialvisit,82.53mmofHg±3.83atfollow-upvisit1,82.77mmofHg±2.45at follow-up visit2, and 83.37mm of Hg±2.38 at follow-upvisit 3. **(Table8).**

Atinitialvisit,themeanPulseasobservedfromdatais9 4.47perminute±11.53 in ARBs+ CCBs (Group A) and 88.97 per minute ± 10.34 in ARBs+ Diuretic(Group B) s. At follow-up 1 visit, the mean Pulse as observed from data is 83.80 perminute ± 6.38 in ARBs+ CCBs (Group A) and 83.00 per minute ± 7.07 in ARBs+Diuretics(GroupB). Atfollow-up2visit, themeanPulseasobservedfromdatais76.20 per minute ± 2.73 in ARBs+ CCBs (Group A) and 77.40 per minute ± 3.93 inARBs+ Diuretics (Group B). At follow-up 3 visit, the mean Pulse as observed fromdatais76.23perminute±3.02inARBs+CCBs(G roupA)and77.87perminute±3.73 in ARBs+Diuretics. Hence the difference of pulse between both the groups atdifferentvisits is not significant. **(Table 9).**

Atinitial visit, the mean Serum Creatinine as observed from data is 1.33mg/dL±0.46inARBs+CCBs(GroupA)and1.11 mg/dL±0.34inARBs+Diuretics(GroupB).Atfollow-up1 visit,the meanSerumCreatinineasobservedfromdata is1.12 mg/dL ± 0.34 in ARBs+ CCBs (Group A) and 1.14 mg/dL ± 0.33 in ARBs+Diuretics (Group B). At follow-up 2 visit, the mean Serum Creatinine as observedfrom data is 1.02 mg/dL ± 0.16 in ARBs+ CCBs (Group A) and 1.11 mg/dL ± 0.32in ARBs+ Diuretics. At follow-up 3 visit, the mean Serum Creatinine as observedfrom data is 1.03 mg/dL ± 0.16 in ARBs+ CCBs (Group A) and 1.07 mg/dL ± 0.30in ARBs+ Diuretics (Group B). The mean serum creatinine P-values of both thegroups at different visits isnot significant. **(Table 10).**

Atinitialvisit,themeanSerumSodiumlevel asobservedfromdatais145.29 mEq/L ± 6.93 in ARBs+ CCBs(Group A) and 141.87 mEq/L ± 7.57 inARBs+ Diuretics. At follow-up 1 visit, the mean Serum Sodium level as observedfromdatais142.04mEq/L±4.72inARBs+C CBs(GroupA)and140.24mEq/L±5.74 in ARBs+ Diuretics (Group B). At follow-up 2 visit, the mean Serum Sodiumlevelasobservedfromdatais139.58mEq/L±4 .44inARBs+CCBs(GroupA)and138.57mEq/L±4.7 6inARBs+Diuretics(GroupB).Atfollow-up3visit,themeanSerum Sodium level as observed from data is 138.75 mEq/L ± 4.43 in ARBs+ CCBs(Group A) and 138.03mEq/L ± 4.67 inARBs+ Diuretics(GroupB).Hence themean value of Serum Sodium level between both the groups at different visits is notsignificant. **(Table 11).**

Atinitialvisit,themeanSerumPotassiumlevelasobse rvedfromdatais3.96 mEq/L ± 0.49 in ARBs+ CCBs (Group A) and 3.84 mEq/L ± 0.59 in ARBs+Diuretics. At follow-up 1 visit, the mean Serum Potassium level as observed fromdata is 3.57 mEq/L ± 0.51 in ARBs+ CCBs (Group A)and 3.52 mEq/L ± 0.37 inARBs+ Diuretics (Group B). At follow-up 2 visit, the mean Serum Potassium levelas observed from data is 3.51 mEq/L ± 0.40 in

ARBs+ CCBs (Group A) and 3.37mEq/L ± 0.42 in ARBs+ Diuretics (Group B). At follow-up 3 visit, the mean SerumPotassium level as observed from data is 3.40 mEq/L ± 0.33 inARBs+ CCBs(Group A) and 3.27 mEq/L ± 0.47 in ARBs+ Diuretics. The mean serum potassiumP-valuesofboth the groupsat differentvisits isnotsignificant.**(Table12).**

AdherencewasnearlysameforboththegroupsasMMAS-8scorewasnotsignificant.NosideeffectsandMACEwasseeninboththegroupsatdifferentvisits. **(Table13).**

ItmaybeconcludedthatARBs+CCBs(GroupA)wasa moreeffectivecombinationas compared toARBs+Diuretics(GroupB)

CONCLUSION

ThroughthisstudyweconcludethatARBs+CCBs(GroupA)drugcombination is more effective than ARBs + Diuretics (Group B) drug combination inreducingthe blood pressure.

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