CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.2528361

Available online at: http://www.iajps.com Research Article

EFFECTIVENESS OF ANTI-HYPERTENSION DRUGS: A COMPARATIVE STUDY

[1]Dr. Saqib Nisar, [2]Dr. Farah Ashraf, [3]Dr. Faraz Ahmed

[1]Sheikh Zayed Hospital, Lahore

[2]Lahore General Hospital, Lahore

[3]Mayo Hospital, Lahore

Abstract:

Objective: *The main theme of our study was to find out the efficiency of various types of medicines used for hypertensive curing.*

Design of Study: *Observations based comparison study.*

Duration and Place: *This study was carried out from June, 2018 to August, 2018 for the duration of 90 days in Medicine department of Lahore General Hospital, Lahore.*

Materials and Methods: *A total of 300 patients were selected for the study and the time duration of the study was 3 months. Four groups were formed consisting of 75 patients each. Medicines of four types were given to each group include; Atenolol, Captopril, Amlodipine and Irbesartan. After the time interval of 15 days, 30 days, and 60 days, checked and noted the blood pressure of all patients.*

Results: *According to the observations pressure of the blood noticed as reduced in all groups. Compared to other drugs irbesartan showed very good result in reducing the blood pressure.*

Conclusion: *Compared to other medicines of hypertension, irbesartan is much more affective for taking control of blood pressure as per findings of current observational study. But for more good description of antihypertensive drugs, there is need of more research.*

Key words: *Captopril, Atenolol, Irbesartan, Antihypertensive drugs, Amlodipine.*

Corresponding author:

Dr. Saqib Nisar,

Sheikh Zayed Hospital,

Lahore

QR code

Please cite this article in press Saqib Nisar et al., ***Effectiveness of anti-hypertension drugs: A comparative study.,*** *Indo Am. J. P. Sci, 2018; 05(12).*

INTRODUCTION:

Rise in Systolic and Diastolic blood pressure levels, increases the hazard of coronary atherosclerotic disease. With a rise in systolic blood pressure levels diastolic blood pressure levels, hazard of coronary atherosclerotic disease is directly in relation. According to study by Frohlich et al in 2010, with old age, occurrence of left ventricular hypertrophy rises and in hypertensive patients this rate is higher. Power of the blood experienced on any unitary vessel wall area is known as Blood Pressure levels. Guyton et al describes in his study in 2013 that diastolic/systolic pressure, peripheral vascular resistance, cardiac output and maximum pressure in arteries are the factors of systolic blood pressure. Complications can be well indicated by systolic blood pressure as per findings of Massie in 2014. Increased death and illness were greatly considered as by the reason of increase in the systolic and diastolic blood pressure for very long duration in the persons having age more than 50 years.

Incessant blood pressure in males and females was reported in many epidemiological researches on ethnic groups, old age persons, middle and young aged people in the country by Vasan et al in 2013. With diastolic blood pressure variation, risk of disease increases as observed in a study on 100 adult persons as illness is in relation with the abnormal high BP with sufficient rise. According to the findings of Chobaxian et al in 2012, hypertensive condition will be considered when diastolic BP is more than 95mmHg and systolic BP is more than 160mmHg. Hypertension is usually developed through lazy life styles and by many physical exercises blood pressure can be maintained at normal level. Schiffrin et al in 2009 described the related factors as endothelial dysfunction and genetic dysfunction. Vikrant in his study in 2010 also stated that functional vasoconstriction or structural thickening might be a factor.

Pastor Barriuso et al in 2013 in his epidemiological study reported an absolute dividing line among normal blood pressure and abnormal blood pressure. According to Frohlic et al (2012) patients of hypertension have a direct risk of cardiovascular complications, as hypertension also known as heterogeneous disorder and it can be controlled by adopting different pathophysiological methods. Essential hypertension is also a type of hypertension in which specific medical condition of patient cannot be explained. Carretero stated in his study in 2000 that about 90 percent to 95 percent cases of hypertension are having essential hypertension.

MATERIALS AND METHODS:

The study was carried out starting from June, 2018 to August, 2018 for the duration of 90 days at in Medicine Department of Lahore General Hospital (LGH), Lahore. A total of 300 patients of hypertension were selected for the study after a diet regimen i.e controlling sodium in regular diet, exercise for half an hour/day and everyday physical activity with alteration in food, change of lifestyle for 30 days interval and weight loss. Four groups of patients were formed, consisting of 75 patients each each group. Medicine of four different types were given to each group include; atenolol, captopril, amlodipine and irbesartan.

Essential hypertension was newly diagnosed in all selected patients and age of both genders was in the range of 25 years to 75 years. Life style of the patients was modified during this observational study. For the minimum of 01 month the readings of controlled blood pressure were by recording it 3 times a day. Excludability criteria was as patients already taking antihypertensive drugs, liver dysfunction and asthma, breastfeeding mothers, pregnant women, patients with history of unstable angina orcoronary artery disease, NSAIDs and anti hypertensives allergy test groups.

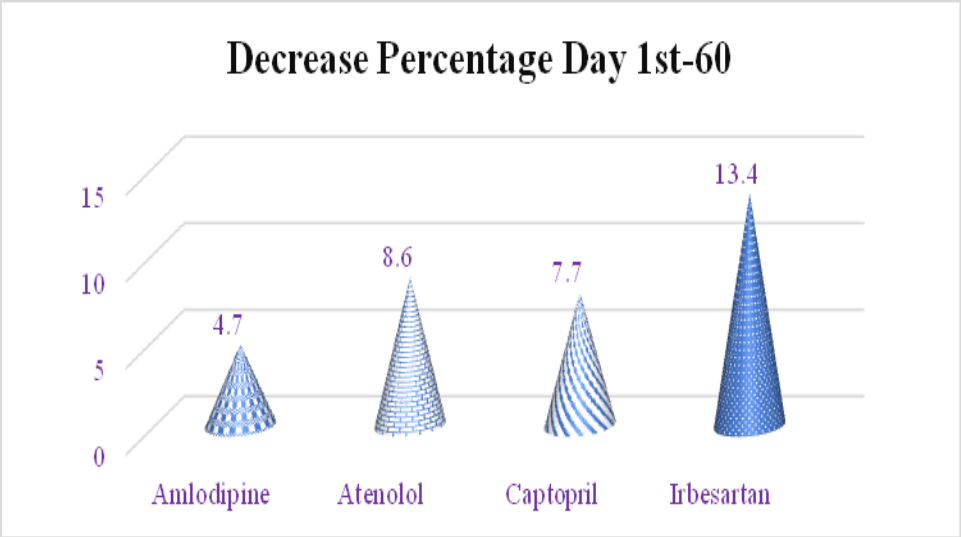
RESULTS:

On first day and 30th day patients treated with amlodipine showed mean ± SEM Systolic BP values as 154.2 ± 1.62 mmHg and 152.0 ± 1.94mmHgrespectively and 143.8 ± 1.98mmHg after 60 days with decrease of 4.7 %.Patients treated with atenolol on first day, 30th day and 60th day showed systolic mean values as 157.8±2.72mmHg, 146.6±2.91mmHg and 137.2±2.40 mmHg respectively with decrease of 8.6%. Patients treated with captopril on first day, 30th day and 60th day showed systolic mean values as 157.3±2.43mmHg, 148.6±2.51mmHg and 139.8±2.98 mmHg respectively with decrease of 7.7%.Patients treated with Irbesartan on first day, 30th day and 60th day showed systolic mean values as 160.2±1.97mmHg, 145.8±1.80 mmHg and 131.4±2.28 mmHg respectively with decrease of 13.4%.results are shown bellow in table No 01.

Table No 01: Changes in mean systolic Bp from 1st day to day 60

Groups (n=75)	Day 1st(mmHg)	Day 30 (mmHg)	Day 60 (mmHg)	Decrease % Day 1st-60
Amlodipine	154.2±1.62	152.0±1.94	143.8±1.98	4.70
Atenolol	157.8±2.72	146.6±2.91	137.2±2.40	8.60
Captopril	157.3±2.43	148.6±2.51	139.8±2.98	7.70
Irbesartan	160.2±1.97	145.8±1.80	131.4±2.28	13.4

Mean±SEM: P<0.01 significantly decreases from 1st day
P<0.01 significantly decreases from day 1st and day 30

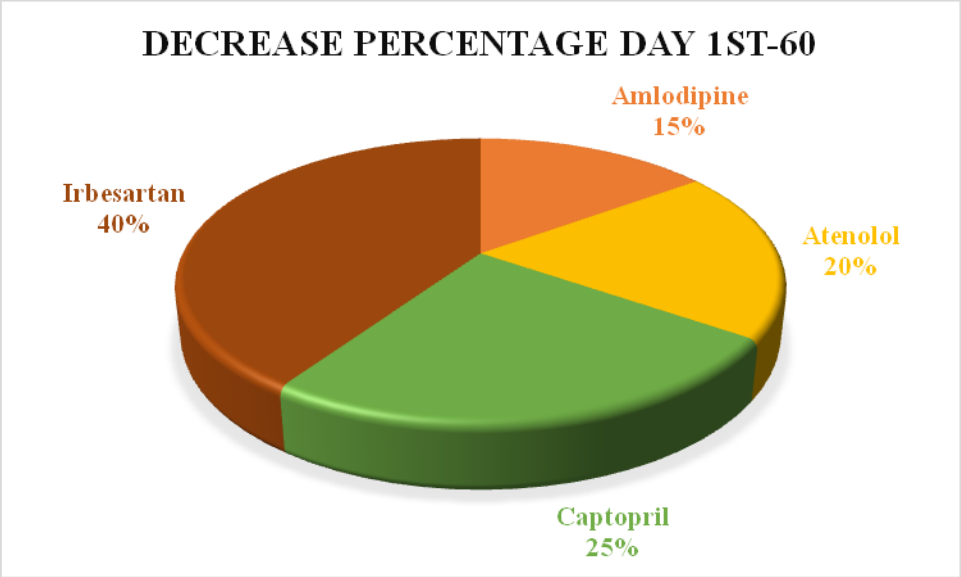


Patients treated with amlodipine on first day, 30th day and 60th day showed diastolic BP mean values as 96 ± 0.96mmHg, 93 ± 1.63 mmHg and 88.6 ± 1.86 mmHg respectively with decrease of 4.2%.Patients treated with atenolol on first day, 30th day and 60th day showed diastolic BP mean values as 97.6 ± 1.53mmHg, 91.8 ± 1.58 mmHg and 87.2 ± 1.78 mmHg respectively with decrease of 5.46%.Patients treated with captopril on first day, 30th day and 60th day showed diastolic BP mean values as 97.4 ± 1.05 mmHg, 91 ± 1.42 mmHg and 87.6 ± 1.94 mmHg respectively with decrease of 7.0%.Patients treated with Irbesartan on first day, 30th day and 60th day showed diastolic BP mean values as 97.2 ± 1.45 mmHg, 93.2 ± 1.44 mmHg and 85.6 ± 1.72 mmHg respectively with decrease of 11.30%. Results are shown in table No 02.

Table No 02: Changes in mean Diastolic BP from day 1st to day 60

Groups (n=75)	Day 1st (mmHg)	Day 30 (mmHg)	Day 60 (mmHg)	Decrease % Day 0-60
Amlodipine	96 ± 0.96	93 ± 1.63	88.6 ± 1.86	4.20
Atenolol	97.6 ± 1.53	91.8 ± 1.58	87.2 ± 1.78	5.46
Captopril	97.4 ± 1.05	91 ± 1.42	87.6 ± 1.94	7.00
Irbesartan	97.2 ± 1.45	93.2 ± 1.44	85.6 ± 1.72	11.3

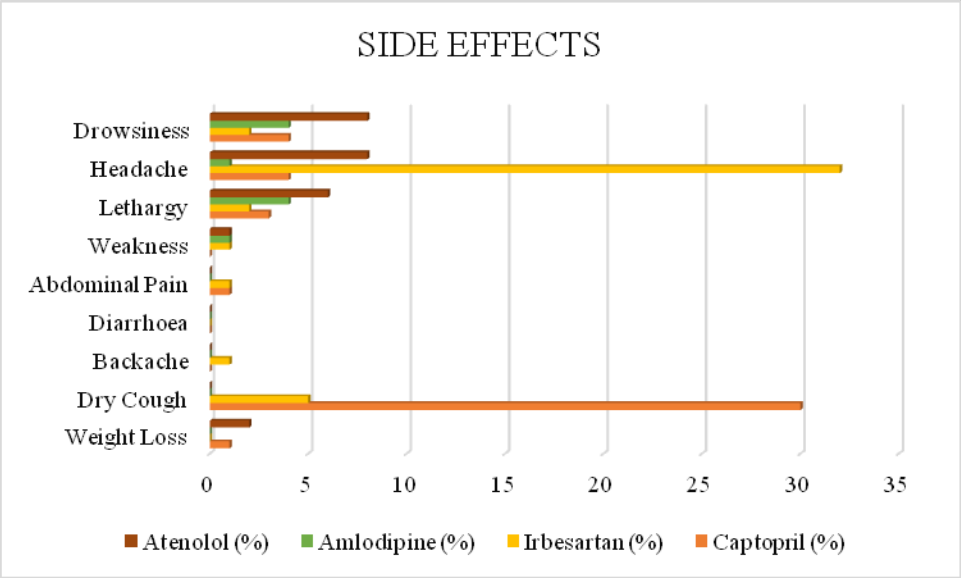
Mean±SEM: P<0.01 significantly decreases from 1st day
P<0.01 significantly decreases from day 1st and day 30



Ratio of side effects is described in table No 3 below.

Table No 03: Percentage of Side Effects with Four Antihypertensive Drugs

Side Effect	Captopril (%)	Irbesartan (%)	Amlodipine (%)	Atenolol (%)
Weight Loss	1	0	0	2
Dry Cough	30	5	0	0
Backache	0	1	0	0
Diarrhoea	0	0	0	0
Abdominal Pain	1	1	0	0
Weakness	0	1	1	1
Lethargy	3	2	4	6
Headache	4	32	1	8
Drowsiness	4	2	4	8



DISCUSSION:

While the treatment of hypertension there are many factors which pay an affective role through different methods. Essential hypertension is a heterogeneous disease that is the reason its treatment is difficult but with such a wide verity of treatment methods, curing has become a little bit easy through medication and physical methods. DBP and SBP shown reduction through atenolol and amlodipine respectively as described in table one above. DBP and SBP reduced P value as <0.010 in captopril group and in Irbesartan group DBP and SBP also reduced P value as <0.010. Warber et al in 1998 and 2010, made a comparison of atenolol with Irbesartan which is a long-acting antihypertensive receptor antagonist and found irbesartan more effective in decreasing DBP and SBP. Results of atenolol group of current study, as anti-hypertension are comparable with another study by Dahlofet et al carried out in 2002. Patients with moderate and mild essential hypertension, effectiveness and protection of amlodipine was lessas compared to atenolol, reported by Freshman et al in 1988. Findings of this study are also same alike where atenolol compared to amlodipine, showed more effectiveness in the reduction of systolic and diastolic blood pressure. Observed maximum reduction in both systolic and diastolic blood pressure with the use of irbesartan in out research study. Comparable results were observed in a study by Reves et al in 1998 which stated the irbesartan as most effective and safe anti-hypertension drug for the treatment of mild to moderate hypertension on the description of one dose per day. The results of present study were found also comparable with colleagues and pool study performed in 1998.

CONCLUSION:

According to the findings of out research study, the most effective and secure medicine for curing of hypertension is Irbesartan.

REFERENCES:

1. Morsi, Nadia M., Ahmed A. Aboelwafa, and Marwa HS Dawoud. "Enhancement of the bioavailability of an antihypertensive drug by transdermal protransfersomal system: formulation and in vivo study." Journal of liposome research 28, no. 2 (2018): 137-148.
2. Mathew, Ritu A., Samuel Johnson, Shalumol Jose, Shampa Chakraborty, N. Kenneth, and Veeranna Gowda. "A comparative study of monotherapy versus combination therapy in patients with stage-1 hypertension in terms of efficacy and cost effectiveness and to assess the medication adherence." International Journal of Research in Pharmaceutical Sciences 9, no. 1 (2018): 147-153.
3. Chiu, H.Y., Chang, W.L., Tsai, T.F., Tsai, Y.W. and Shiu, M.N., 2018. Risk of psoriasis following terbinafine or itraconazole treatment for onychomycosis: a population-based case-control comparative study. Drug safety, 41(3), pp.285-295.
4. Zhang, S., Tao, L., Hui, R. and Zhang, W., 2018. P3805 Evaluation of blood pressure lowering effect by generic and brand-name antihypertensive drug treatment: a prospective multicenter study in China. European Heart Journal, 39(suppl_1), pp.ehy563-P3805.
5. Zhang, S., L. Tao, R. Hui, and W. Zhang. "P3805 Evaluation of blood pressure lowering effect by generic and brand-name antihypertensive drug treatment: a prospective multicenter study in China." European Heart Journal 39, no. suppl_1 (2018): ehy563-P3805.
6. Ayyagari, Rajeev, JipanXie, David Cheng, Eric Q. Wu, Xing-Yue Huang, and Stephanie Chen. "A retrospective study evaluating the tolerability and effectiveness of adjunctive antihypertensive drugs in patients with inadequate response to initial treatment." The Journal of Clinical Hypertension 20, no. 6 (2018): 1058-1066.
7. Ho, Cheng-Maw, Chih-Hsin Lee, Ming-Chia Lee, Jun-Fu Zhang, Jann-Yuan Wang, Rey-Heng Hu, and Po-Huang Lee. "Comparative effectiveness of angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers in chemoprevention of hepatocellular carcinoma: a nationwide high-risk cohort study." BMC cancer 18, no. 1 (2018): 401.
8. Ohashi K, Hayashi T, Watanabe Y, Hara K, Ukichi R, Asano H, Suzuki H, Yamashiro K, Tojo K, Sakamoto M, Utsunomiya K. Primary Aldosteronism With Type 2 Diabetes Mellitus Requires More Antihypertensive Drugs for Blood Pressure Control: A Retrospective Observational Study. Journal of clinical medicine research. 2018 Jan;10(1):56.
9. Thomopoulos, Costas, Gianfranco Parati, and Alberto Zanchetti. "Effects of blood pressure-lowering treatment on cardiovascular outcomes and mortality: 14–effects of different classes of

antihypertensive drugs in older and younger patients overview and meta-analysis." Journal of hypertension36, no. 8 (2018): 1637-1647.

10. Okuda, T., Okamura, K., Shirai, K. and Urata, H., 2018. Effect of angiotensin-converting enzyme inhibitor/calcium antagonist combination therapy on renal function in hypertensive patients with chronic kidney disease: chikushi anti-hypertension trial-benidipine and perindopril. Journal of clinical medicine research, 10(2), p.117.
11. Tsoi, Bernice, Leo E. Akioyamen, Ashley Bonner, Claudia Frankfurter, Mitchell Levine, Eleanor Pullenayegum, Ron Goeree, and Daria O'Reilly. "Comparative Efficacy of Angiotensin II Antagonists in Essential Hypertension: Systematic Review and Network Meta-Analysis of Randomised Controlled Trials." Heart, Lung and Circulation27, no. 6 (2018): 666-682.
12. Hassan, Noura A., Hany M. El Bassossy, Ahmed Fahmy, and Mona F. Mahmoud. "Limonin alleviates macro-and micro-vascular complications of metabolic syndrome in rats: A comparative study with azelnidipine." Phytomedicine 43 (2018): 92-102.
13. Qi, Han, Zheng Liu, Han Cao, Wei-Ping Sun, Wen-Juan Peng, Bin Liu, Sheng-Jie Dong, Yu-Tao Xiang, and Ling Zhang. "Comparative efficacy of antihypertensive agents in salt-sensitive hypertensive patients: a network meta-analysis." American journal of hypertension 31, no. 7 (2018): 835-846.
14. Sharma, Nidhi, Gurpreet Kaur Randhawa, and Rajiv Sharma. "Comparative Evaluation of Effect of Losartan and Amlodipine as Monotherapy on Serum Uric Acid Levels in Patients of Hypertension with Hyperuricaemia." international journal of scientific research 7, no. 3 (2018).
15. Deora s, pal r. Comparative evaluation of oral nifedipine versus intravenous labetalol for acute blood pressure control in severe preeclampsia. International journal of scientific research. 2018 Jun 15;7(3).