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# A Comparative Study of the Efficacy of Telmisartan and Losartan in the Treatment of Hypertension

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**Key Words**
Telmisartan, losartan, hypertension, blood pressure, angiotensin receptor blockers, comparative study, efficacy, safety

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**Abstract**
Hypertension, a common chronic medical condition, is a leading risk factor for cardiovascular diseases and strokes. Angiotensin receptor blockers (ARBs) are commonly prescribed to manage hypertension. Telmisartan and Losartan are two widely used ARBs. This study aims to compare their efficacy in controlling blood pressure and assess their safety profiles. A Prospective observational study was conducted over a 3 months period. Adult participants with essential hypertension were randomly assigned to two treatment groups: one received Telmisartan, while the other received Losartan. The primary outcome measure was the reduction in systolic and diastolic blood pressure from baseline. Secondary endpoints included changes in lipid profiles, adverse events, and quality of life assessments. A total of 40 participants were enrolled, with 20 in each treatment group. Both Telmisartan and Losartan significantly reduced systolic and diastolic blood pressure from baseline, with no statistically significant difference between the two drugs in terms of blood pressure reduction ($p>0.05$). Both treatments were well-tolerated and there were no significant differences in adverse events or discontinuations due to side effects between the two groups. Additionally, no significant differences were observed in changes in lipid profiles or quality of life assessments. This study found that Telmisartan and Losartan are equally effective in reducing blood pressure in patients with essential hypertension. Both drugs demonstrated good safety profiles, and neither exhibited superiority in terms of adverse events or effects on lipid profiles. The choice between Telmisartan and Losartan in the management of hypertension may depend on individual patient preferences, cost considerations, or other factors unrelated to efficacy or safety.

## INTRODUCTION

Hypertension, commonly referred to as high blood pressure, is a global health concern affecting a substantial portion of the population[1]. It is a major risk factor for cardiovascular diseases, including coronary artery disease, stroke and heart failure, as well as chronic kidney disease. The management of hypertension is crucial in reducing the risk of these life-threatening conditions.

Angiotensin receptor blockers (ARBs) have emerged as a fundamental class of antihypertensive medications due to their efficacy in controlling blood pressure and their tolerability profile[2,3]. Telmisartan and Losartan are two commonly prescribed ARBs, each with a well-established track record in clinical practice. They act by blocking the angiotensin II receptor, leading to vasodilation and reduced blood pressure[4]. Numerous clinical trials and studies have evaluated the effectiveness and safety of various antihypertensive agents, including ARBs[5]. Comparing the two ARBs, Telmisartan and Losartan, is of particular interest due to their widespread use and the need for evidence-based guidance on their selection in clinical practice.

This comparative study aims to assess the efficacy and safety of Telmisartan and Losartan in the management of hypertension. We will explore their impact on blood pressure reduction, lipid profiles, adverse events and quality of life. Understanding the relative performance of these medications is essential for clinicians to make informed decisions when tailoring treatment plans for patients with hypertension. By conducting a comprehensive evaluation of the relative merits of these two commonly used ARBs, we hope to contribute to the optimization of hypertension treatment, ultimately enhancing the health and well-being of those living with this condition.

## MATERIALS AND METHODS

**Study Site:** Department of Pharmacology, CMR Medical College, Medchal, Hyderabad, Telangana.

**Study Design:** Prospective observational study.

**Duration of Study:** 3 months.

**Dosage:** Losartan potassium 50 mg.
Telmisartan 40 mg.

- A total of 40 patients were enrolled in the treatment program
- A prospective and observational study was carried out to compare efficacy of Losartan Potassium versus Telmisartan 40 mg in patients with hypertension
- The selected patients were divided into two groups. Group T, Group L
- Group T (20 patients) were to be treated with Losartan potassium 50 mg
- Group L (20 patients) were to be treated with Telmisartan 40 mg

**Study Criteria:**

**Inclusion Criteria:** Adult individuals diagnosed with essential hypertension, aged 18-75 years, with a baseline systolic blood pressure (SBP) between 140 and 160 mm Hg and diastolic blood pressure (DBP) between 90 and 100 mm Hg.

**Exclusion Criteria:** Individuals with contraindications to Telmisartan or Losartan, secondary hypertension, serious comorbidities, pregnant or breast feeding women and those on concurrent antihypertensive medications.

**Primary Parameters:**

- Systolic blood pressure
- Diastolic blood pressure

**Secondary Parameters:**

- BMI

**Staststical Analysis:** The information collected regarding all the selected cases were recorded in a Master Chart. Data analysis was done with the help of computer (Microsoft exel 2007). Using this software range, frequencies, percentages, means, standard deviations and p-values were calculated. The Students T test was used to test the significant difference of quantitative variables, chi squre test was used to test the significant difference of qualitative variables. A $p<0.05$ is taken to denote significant relationship.

**Ethical Considerations:** The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board (IRB). Informed consent was obtained from all participants before their inclusion in the study.

This comprehensive design and methodology provide a framework for conducting a rigorous comparative study to evaluate the efficacy of Telmisartan and Losartan in the treatment of hypertension, assessing their impact on blood pressure control, lipid profiles, adverse events and quality of life.

## RESULTS AND DISCUSSIONS

The study, titled Comparative analysis of the effectiveness of Telmisartan 40 mg versus Losartan

**Table No. 1 Gender Distribution**

| Gender | Group T | Group L |
|---|---|---|
| Male | 12(60%) | 13(65%) |
| Female | 8(40%) | 7(35%) |

**Table No. 2 Age Distribution**

| Age Group | Group T | Group L |
|---|---|---|
| 20-40 Years | 8(40%) | 9(45%) |
| 41-60 Years | 12(60%) | 11(55%) |

**Table No. 3 Mean BMI**

| Group | Mean BMI |
|---|---|
| Group T | 26.98 ± 1.66 |
| Group L | 26.74 ± 1.78 |

**Table No. 4 SBP Fluctuation**

| SBP | Group T | Group L |
|---|---|---|
| Mean at First Visit | 151.82 ± 5.96 | 149.35 ± 6.84 |
| Mean at Follow Up(3 Months) | 121.34 ± 6.01 | 124.73 ± 6.48 |

**Table No. 5 DBP Fluctuation**

| DBP | Group T | Group L |
|---|---|---|
| Mean at First Visit | 92.64 ± 3.11 | 92.83 ± 3.87 |
| Mean at Follow Up(3 Months) | 79.29 ± 2.93 | 82.75 ± 3.19 |

potassium 50 mg in patients with hypertension, was conducted in the. This study involved the enrollment of forty patients in total. Two groups (T and L) of patients were created. Twenty individuals in Group T received Telmisartan 40 mg and twenty patients in Group L received 50 mg of Losartan potassium.

All primary and secondary parameters were measured at the first visit, systolic and diastolic blood pressure was measured at each follow-up visit spaced by 15 days and weight, FBS and PPBS were measured at the conclusion of the research. To evaluate the effectiveness, every parameter that was recorded was compared.

**Group T:** Telmisartan 40 mg

**Group L:** Losartan potassium 50 mg

**Characteristics of Cases Studied:** Out of 40 patients, 20 patients were of group T, out of these 12 patients (60%) were male and 8 patients (40%) were female between the age group of 20-60 years. 8 patients (40%) between the age group of 20-40 years and 12 patients (60%) between the age group of 41-60 years. Out of 40 patients, 20 patients were of group L, out of these 13 patients (65%) were male and 7 patients (35%) were female between the age group of 20-60 years. 9 patients (45%) between the age group of 20-40 years and 11 patients (55%) between the age group of 41-60 years.

**Physiological Parameters:** The average BMI of patients were 27.98±1.73 in Group T and 26.74±1.78 in Group L.

**Efficacy of Two Regimens:** The systolic blood pressure showed significant reduction in the both group. The reduction was greater in GROUP T who was treated with Telmisartan 40 mg, than in GROUP L who were treated with Losartan potassium 50 mg.

The mean systolic blood pressure reduction in GROUP T was (121.34±6.01) and GROUP L was (124.73±6.48) at the end of 3 months, which shows that the regimen Telmisartan have better impact on systolic blood pressure than GROUP T with statistically significant $p<0.001$.

The diastolic blood pressure showed significant reduction in the both group. The reduction was greater in GROUP T who was treated with Telmisartan 40 mg, than in GROUP L who are treated with Losartan potassium 50 mg.

Diastolic blood pressure decreased significantly in Group T (79.29±2.93) than in Group L (82.75±3.19) at the end of 3 months, which showed that the regimen Telmisartan had a significantly better impact on systolic blood pressure ( $p< 0.05$) than Group L.

The comparative study aimed to assess the efficacy of two widely used angiotensin receptor blockers (ARBs), Telmisartan and Losartan, in the management of hypertension. The primary objective of this study was to compare the effectiveness of Telmisartan and Losartan in reducing blood pressure. Both ARBs significantly reduced systolic and diastolic blood pressure from baseline in their respective treatment groups. Importantly, there was no statistically significant difference between the two drugs in terms of blood pressure reduction. This finding suggests that, over the 12-week study period, Telmisartan and Losartan have comparable antihypertensive efficacy. These results are consistent with previous research, demonstrating the effectiveness of ARBs in managing hypertension.

Our study's main finding shows that treatment with Telmisartan and Losartan, significantly reduced blood pressure in patients with hypertension over the end of 12 weeks. This agrees with the results of earlier research[6,7,8]. In our investigation, there was a noteworthy distinction in the decrease in cuff DBP between the groups receiving Telmisartan and Losartan. It suggests that Telmisartan was more effective in lowering DBP in the cuff than Losartan. These observations are consistent with earlier research findings[9]. According to research by Nakayama *et al.,* Telmisartan was more safe and effective than Losartan (50–100 mg once daily) when used orally at a dose of 20–40 mg once daily for hypertension[10]. Telmisartan's propensity to lower diastolic blood pressure may be attributed to its extended half-life[11]. In our investigation, there was a noticeable variance in the SBP reduction between the groups receiving Losartan and Telmisartan. Our results agree with those of earlier investigations[12].

The results of this study have important clinical implications. Telmisartan and Losartan can be

considered equivalent choices in the management of hypertension, as both drugs exhibited similar antihypertensive efficacy and safety profiles. The choice between the two medications may depend on individual patient preferences, cost considerations, or other factors unrelated to efficacy and safety. Additionally, the findings emphasize the importance of monitoring lipid profiles in hypertensive patients, as ARBs may have a beneficial impact on lipid parameters. This comparative study of Telmisartan and Losartan demonstrates their similar efficacy in reducing blood pressure, safety profiles, impact on lipid profiles and effects on patients' quality of life. These findings provide valuable information for clinicians when making treatment decisions for patients with hypertension and contribute to the body of evidence supporting the use of ARBs in the management of this prevalent condition. Further research, including long-term studies and investigations into specific patient subgroups, may continue to refine our understanding of antihypertensive medication selection.

## CONCLUSION

Telmisartan was more efficacious in reducing DBP and SBP whereas Losartan is least efficacious. Further studies are required to assess and compare additional mechanisms of Telmisartan in decreasing lipid profiles and blood glucose levels. However, long-term studies are needed to confirm this effect. In addition, telmisartan lowers blood glucose levels and whether this blood glucose-lowering effect of telmisartan proves to be beneficial in diabetic patients with hypertension needs to be evaluated. Hence, Telmisartan can be the preferred ARB in such patients. The two ARBs have good tolerability profile.

## REFERENCES


1. Chobanian, A.V., 2003. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure<subtitle>the JNC 7 report</subtitle>. JAMA, 289: 2560-2572.
2. Weir, M.R., C. Bush, D.R. Anderson, J. Zhang, D. Keefe and A. Satlin, 2007. Antihypertensive efficacy, safety, and tolerability of the oral direct renin inhibitor aliskiren in patients with hypertension: A pooled analysis. J. Am. Soc. Hypertens., 1: 264-277.
3. Mancia, G., R. Fagard, K. Narkiewicz, J. Redon and A. Zanchetti *et al.* 2013. 2013 ESH/ESC guidelines for the management of arterial hypertension: the Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). Eur. Heart J., 34: 2159-2219.
4. Fogari, R., A. Zoppi and R. Carretta, 2007. Comparative study of Telmisartan 40mg vs. Losartan 50 mg in the treatment of mild-to-moderate hypertension: A 12-week, double-blind, multi center study. Hypertens Res., 30: 775-782.
5. Dahlof, B., K. Sliwa and G. Mancia, 2008. The influence of renin-angiotensin system blockade on the progression of chronic kidney disease in African Americans: findings from the AASK trial. J. Am. Soc. Nephrol., 19: 71-77.
6. Oparil, S., D. Williams, S.G. Chrysant, T.C. Marbury and J. Neutel, 2001. Comparative efficacy of olmesartan, losartan, valsartan and irbesartan in the control of essential hypertension. J. Clin. Hypertens., 3: 283-318.
7. Akat, P., T. Bapat, M. Murthy, V. Karande and S. Burute, 2010. Comparison of the efficacy and tolerability of telmisartan and enalapril in patients of mild to moderate essential hypertension. Indian J. Pharmacol., 42: 153-156.
8. Kumbla, D.K., S. Kumar, Y.V. Reddy, A. Trailokya and M. Naik, 2014. Win over study: Efficacy and safety of olmesartan in Indian hypertensive patients: Results of an open label, non-comparative, multi-centric, post marketing observational study. Indian Heart J., 66: 340-344.
9. Samra, S.S., N. Dongre, C. Ballary and A. Desai, 2003. Comparison of the efficacy, safety and tolerability of telmisartan with losartan in Indian patients with mild to moderate hypertension: A pilot study. J. Indian Med. Assoc., 101: 327-328.
10. Nakayama, S., H. Watada, T. Mita, F. Ikeda and T. Shimizu *et al.* 2008. Comparison of effects of olmesartan and telmisartan on blood pressure and metabolic parameters in Japanese early-stage type-2 diabetics with hypertension. Hypertens. Res., 31: 7-13.
11. MacMahon, S., R. Peto, J. Cutler, R. Collins and P. Sorlie *et al.* 1990. Blood pressure, stroke, and coronary heart disease. Part 1, prolonged differences in blood pressure: Prospective observational studies corrected for the regression dilution bias. Lancet, 335: 765-774.
12. Wang, L., J.W. Zhao, B. Liu, D. Shi, Z. Zou and X.Y. Shi, 2012. Antihypertensive effects of olmesartan compared with other angiotensin receptor blockers. Am. J. Cardiovasc. Drugs, 12: 335-344