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# Comparative Efficacy of Valsartan and Valsartan-Hydrochlorothiazide combination Therapy in Hypertensive Heart Disease Patients: a Clinical and Ultrasonographic Study

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## ABSTRACT

**Objective:** This study aimed to evaluate the clinical efficacy and ultrasound diagnostic outcomes of valsartan combined with hydrochlorothiazide in the treatment of hypertensive patients with heart disease.

**Material & Methods**: A total of 160 patients diagnosed with hypertension and concomitant heart disease who received treatment at Federal Institute of Health Sciences affiliated hospital were enrolled from June 2025 to Sep 2025 and randomly assigned into two equal groups of 80 each. The control group received valsartan monotherapy, while the study group was administered valsartan in combination with hydrochlorothiazide. The therapeutic efficacy and incidence of adverse reactions were compared between the two groups.

**Results:** Results demonstrated that the study group exhibited a significantly higher overall treatment efficacy and a lower rate of adverse reactions compared to the control group ($P<0.05$). Post-treatment comparisons revealed greater improvements in both systolic and diastolic blood pressure in the study group ($P<0.05$). Ultrasonic echocardiographic assessments indicated superior recovery in the study group with respect to left ventricular mass index, posterior wall thickness, and ejection fraction ($P<0.05$).

**Conclusion:** In conclusion, combination therapy with valsartan and hydrochlorothiazide markedly enhances clinical outcomes and reduces adverse events in hypertensive patients with heart disease, supporting its broader clinical adoption..

**Keywords:** *Efficacy, Valsartan-Hydrochlorothiazide, Hypertensive Heart Disease*

## 1. INTRODUCTION

A greater quality of living has been made possible in recent years by the social economy's fast expansion, which has also brought about changes in food habits and lifestyle that have increased the prevalence of hypertensive heart disease[1].

Furthermore, newer generations are becoming affected by this condition. The illness is hard to cure and can lead to major conditions such heart failure, stroke, and coronary heart disease, which can significantly affect patients' ability to lead normal lives[2,3]. In order to slow the disease's progression and lower patient mortality and disability, proactive and efficient initiatives should be implemented. When hypertension is poorly managed over an extended period of time, it can result in heart disease, which alters the structure and function of the heart. It mostly manifests as left ventricular hypertrophy and early reduced diastolic function which progresses to decreased myocardial systolic function and heart failure[4,5].

The key to treating this condition is active and efficient antihypertension medication. Currently, medication is the primary method used to treat hypertension associated with heart disease, and typically positive outcomes are obtained[6. The purpose of this research is to monitor and investigate the clinical effectiveness and ultrasound imaging outcomes of treating hypertensive individuals with heart disease with valsartan and hydrochlorothiazide[7,8,9].

## 2. MATERIAL AND METHODS

The study, which covered the period from June 2025 to September 2025, involved 180 hypertensive patients with heart disease who were treated at Federal Institute of health Sciences affiliated hospital , Lahore, Pakistan.

This work is well-structured, and the result has been accepted by the appropriate departments and ethical bodies. Based on the information in the "Guide to Hypertension Prevention and Treatment of Cardiovascular Diseases," every case was unquestionably diagnosed. Patients must meet the diagnostic requirements for enrollment and provide signed informed consent. They must also be free of any internal medical conditions, cancerous tumors, cardiopulmonary dysfunction, coronary heart disease, myocarditis-induced heart failure, drug allergies, and mental diseases.The patients were divided into equal numbers of reference and research groups at random. 43 men and 37 women, with ages ranging from 45 to 75 and an average age of 62.5±3.0 years, made up the research group. The sickness lasted an average of 4.2±0.5 years, with a range of 2 to 12 years. The reference group consisted of 42 males and 38 females, with an average age of 63.2±3.5 years, and a range of ages from 46 to 73. The sickness lasted an average of 3.2±0.7 years, with a range of 1 to 10 years. When the pertinent data from the two groups were compared, comparability was demonstrated (P>0.05).

Methods of Treatment for the Reference Group. Valsartan was the only treatment given to the reference group. Valsartan was prescribed to the patients. and 50 mg daily was the first dosage. Depending on the patient's condition, the dosage was carefully modified; if the impact is not substantial, it can be raised to 100 mg daily. The Study Group Treatment Techniques. Hydrochlorothiazide and valsartan were administered to the study group.Valsartan was applied in the same way as the reference group. This served as the foundation for the hydrochlorothiazide therapy. It was recommended that the patients take hydrochlorothiazide. If the first dosage of 6.5 mg is not adequate, it is reasonable to increase it to 13 mg daily[10,11].

Both the research group and the reference group received excellent comprehensive care over the course of therapy. A diet based on science program has created light diets that are mostly reduced in fat and salt. The patients have exercised as prescribed. After three months of consistent therapy, the two groups' levels of effectiveness were compared.

## 3. OBSERVATIONAL INDICATORS

The overall effectiveness of the two patient groups' treatments was noted and contrasted: If the patient's cardiac symptoms considerably improve with therapy. The therapy significantly improves the heart's function on one or more level ; Following therapy, there is a noticeable improvement in the patients' cardiac symptoms and a one-level improvement in heart function, indicating that the treatment is successful; therapy is ineffective if the patient's heart symptoms do not get better or if their heart function remains the same or even worsens following therapy. SPSS 21.0 was the statistical analysis program utilized. Whereas the count data were expressed using a natural number (n) and percentage (%), and chi-square was used to compare groups, the measurement data were expressed as mean± average (x ± s), and t was used for group comparison. P<0.05 denotes statistically significant values.

## 4. RESULTS

### Changes in blood pressure before and after treatment in both groups

Table 1 compares blood pressure readings and shows that there was no statistically significant change before to therapy (P<0.05). Following therapy, the study group's diastolic and systolic blood pressures clearly decreased (P<0.05, statistically significant).

### Changes of heart function indicators in two groups

Table 2 indicates that, prior to treatment, there was no significant difference between the two groups' heart function indicators (P>0.05); following treatment, the study group's left ventricular mass index and left ventricular posterior wall thickness were significantly higher (P<0.05), while their left ventricular ejection fraction was clearly lower (P<0.05).

### Overall treatment efficacy and incidence of adverse reactions in both groups

As demonstrated in table 3, compared with the reference group, the study group had greater overall treatment efficacy and lower incidence of adverse events, P<0.05, with statistical significance.

**Table 1: Changes in blood pressure before and after treatment in both groups**

| Group | Diastolic pressure (mmHg) | | Systolic pressure (mmHg) | |
|---|---|---|---|---|
| | Before | After | Before | After |
| Study group(n=80) | 112.47±5.80 | 88.65±5.13 | 158.79±7.80 | 124.36±7.11 |
| Reference group(n=80) | 111.39±5.35 | 96.39±5.10 | 157.46±7.05 | 137.80±7.94 |
| t | 0.23 | 6.80 | 1.05 | 6.65 |
| p | >0.05 | <0.05 | >0.05 | <0.05 |

**Table 2: Changes of heart function indicators in two groups**

| Group | Left ventricular mass index (mm) | | Left ventricular posterior wall thickness (mm) | | Left ventricular ejection fraction(%) | |
|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After |
| Study group(n=80) | 155.35±7.35 | 112.30±7.09 | 13.29±1.85 | 8.27±1.12 | 61.20±2.57 | 69.07±3.29 |
| Reference group(n=80) | 156.79±7.20 | 125.83±7.05 | 13.28±1.05 | 9.76±1.59 | 61.22±2.69 | 64.50±2.90 |
| T | 0.10 | 8.05 | 1.02 | 6.70 | 0.11 | 6.09 |
| P | >0.05 | <0.05 | >0.05 | <0.05 | >0.05 | <0.05 |

**Table 3: Overall treatment efficacy and incidence of adverse reactions in both groups**

| Group | Case No. | Overall treatment efficacy | Incidence of adverse reactions |
|---|---|---|---|
| Study group | 80 | 77(96.25) | 3(3.75) |
| Reference group | 80 | 66(82.50) | 12(15.0) |
| $X^2$ | | | 6.72 |
| P | | | <0.05 |

## 5. DISCUSSION

One prevalent cardiovascular condition is hypertension. It is prone to complex renal, liver, and cardiac problems that might raise morbidity and death. In order to avoid and manage vascular events, blood pressure levels must be actively controlled. Reducing blood pressure to the desired level during the treatment of hypertensive heart disease can help lower the mortality and incidence of heart disease[12,13]. Blood pressure must be kept within an optimal range since the incidence of hypertension is brought on by several interrelated factors.

At the moment, combination medication therapy is a successful treatment for hypertensive heart disease and effectively regulates blood pressure. Numerous clinical studies and real-world applications demonstrate that hydrochlorothiazide plus valsartan can effectively treat hypertensive cardiac disease[14,15]. A common angiotensin II receptor inhibitor, valsartan, can significantly decrease peripheral vascular resistance, suppress reflex sympathetic nerve activity, and block the binding of Ang II and AT1 receptors, all of which promote salt and water excretion[16,17].

Additionally, it can lower aldosterone secretion, allowing for long-lasting antihypertensive effects. An efficient thiazide diuretic, hydrochlorothiazide, has a favorable antihypertensive impact through natriuresis; yet, it might readily cause patients' angiotensin and adrenaline to be activated. By inhibiting angiotensin activity, valsartan and hydrochlorothiazide can be used together to have the greatest antihypertensive impact possible. In addition, it can minimize the risk of negative responses, safeguard the organs, and improve the dependability and safety of therapy[18,19,20].

## 6. CONCLUSION

Combination therapy with valsartan and hydrochlorothiazide markedly enhances clinical outcomes and reduces adverse events in hypertensive patients with heart disease, supporting its broader clinical adoption

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