Comparison of Anti Hypertensive Effect of Fixed Dose Enalapril and Losartan in Essential Hypertension

Khurram Mansoor, Syed Hamid Ali Shah, Liaqat Ali,
Department of Medicine, Military Hospital Rawalpindi

Abstract

Background: Angiotensin converting enzyme inhibitors and angiotensin receptor blockers are being extensively used these days for treatment of mild to moderate hypertension. The selection of either of the two drugs is usually based on physician preference. The purpose of the study was to compare antihypertensive effect of fixed dose Enalapril and Losartan in Essential Hypertension.

Methods: In this interventional study therapeutic option of Enalapril (Group 1) and Losartan (Group 2) were offered to 100 newly diagnosed cases of hypertension. The patients were followed on subsequent visits (6 in total) and the systolic and diastolic blood pressures were recorded carefully.

Results: Total number of patients becoming normotensive with Enalapril was 38 (out of 50) and with Losartan were 28 (out of 50).

Conclusion: Enalapril had significantly better antihypertensive effect than Losartan in essential hypertension at the end of six months therapy.

Key Words: Essential Hypertension, Enalapril, Losartan.

Introduction

Hypertension is an increasingly important medical and public health issue. The prevalence of hypertension increases with advancing age to the point where more than half of people aged 60 to 69 years and approximately three-fourths of those aged 70 years and older are affected.

Framingham Heart Study investigators recently reported the lifetime risk of hypertension to be approximately 90% for men and women who were nonhypertensive at 55 or 65 years and survived to age 80 to 85.1

Diastolic blood pressure is a more potent cardiovascular risk factor than systolic blood pressure until age 50; thereafter, systolic blood pressure is more important.2

Clinical trials have demonstrated that control of isolated systolic hypertension reduces total mortality, cardiovascular mortality and stroke.3 Both observational studies and clinical trial data suggest that poor systolic blood pressure control is largely responsible for the unacceptably low rates of overall blood pressure control.4,5 In the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) and Controlled Onset Verapamil Investigation of Cardiovascular End Points (CONVINCE) trial, diastolic blood pressure control rates exceeded 90%, but systolic blood pressure control rates were considerably less (60 to 70%).6,7 Poor systolic blood pressure control is at least in part related to physician attitudes. A survey of primary care physicians indicated that three-fourths of them failed to initiate antihypertensive therapy in older individuals with SBP of 140 to 159 mm Hg, and most primary care physicians did not pursue control to less than 140 mm Hg.8 It has also been shown that pulse pressure is an independent marker of cardiovascular risk, mainly for myocardial infarction.9

Increased pulse pressure is also a predictor of cardiovascular risk in subjects with recurrent myocardial infarction and congestive heart failure.10

ACE inhibitors have achieved widespread usage in the treatment of cardiovascular and renal disease. ACE inhibitors alter the balance between the vasoconstrictive, salt-retentive, and hypertrophic properties of angiotensin II and the vasodilatory and natriuretic properties of bradykinin. They alter the metabolism of a number of other vasoactive substances as well. They have proved effective in the treatment of hypertension, they decrease mortality in congestive heart failure and left ventricular dysfunction after myocardial infarction, and they delay the progression of diabetic nephropathy. The purpose of this study was to compare the anti hypertensive effect of fixed dose Enalapril and Losartan in essential hypertension.

Patients and Methods

This interventional study was conducted in
the department of Medicine Military Hospital Rawalpindi. 100 patients of essential hypertension coming to the OPD of the hospital were selected and divided into 2 groups with 50 patients in each group by using table of random numbers.

Keeping in view the possibility of poor drug compliance and those patients who might fail to appear for regular follow up visits, 15 additional patients were included in both study groups. At the end of the study period only those 50 patients were considered in each group who were strictly compliant with drugs and reported regularly for all follow up visits.

**Inclusion Criteria**
The patients who provided informed written consent. Both males and females, between 25 – 70 years of age. Patients of essential hypertension (Systolic blood pressure > 140 mm Hg and Diastolic blood pressure > 90 mmHg) with poor control of hypertension on diet alone, reporting in medical OPD Military Hospital Rawalpindi.

**Exclusion Criteria**
Patients with Secondary hypertension.
Patients who had any critical illness with expected life expectancy less than 6 months.
A female who was lactating, pregnant or was planning to become pregnant during the course of study.
Patients with co-morbid conditions like unstable angina, congestive cardiac failure and renal impairment.
Patients who had already experienced side effects of these two drugs.
Patients with history of alcohol or drug abuse.

Study Group 1 was given Tablet Enalapril 10 mg and Study Group 2 received Tablet Losartan 50 mg.

**Results**

The mean age of group 1 was 51, and that of group 2 was 50.58 while total mean age of 100 patients was 50.79 years with a standard deviation ±12.13 years (Table 1). Gender distribution of total 100 patients included 62 % males and 38% females. Individual groups had gender distribution such that there were 64 % males and 36 % females in group 1. In other words there were 32 males and 18 females in this group. Whereas in the other study group (group 2) there were 60 % males and 40 % females. This included 30 males and 20 females.

In group 1 the initial mean systolic blood pressure value of the entire group was found to be 178.92 mm Hg, with maximum value being 194 mm Hg and minimum value being 166 mm Hg. On second visit the mean systolic blood pressure value of the same study group became 144.60 mm Hg, the latter values on subsequent visits (third visit to sixth visit) were 140.64, 134.22, 131.04 and 125.50 mm Hg respectively. In the same study group (group 1) the mean diastolic blood pressure at the time of initial presentation (visit 1) and on later follow up visits (second to sixth visits) were 109.10, 101.74, 94.24, 87.32, 81.74 and 76.50 mm Hg respectively. (Figs 1 and 2)

<table>
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<tr>
<th>Table 1: Mean Age of the Patients</th>
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<tr>
<td>n = 100</td>
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<td>Study Group</td>
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<td>Study Group 1 (ENALAPRIL)</td>
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<td>Study Group 2 (LOSARTAN)</td>
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Figure1: Mean Systolic Blood Pressures of Study Group 1 (Enlapril) And 2 (Losartan) On Visits 1 To 6

In the study group 2 the mean systolic blood pressure value was found to be 178.64 mm Hg on first visit. Maximum value was found to be 192 mm Hg and minimum value being 168 mm Hg. On first subsequent visit the mean systolic blood pressure value became 154.78 mm Hg. On later follow up visits these values were found to be 149.58, 145.22, 141.30 and 138.58 mm Hg. In this study group the mean diastolic blood pressure at the time of presentation was 109.16 mm Hg and on later follow up visits were 105.60, 101.56, 98.70, 94.02 and 90.64 mm Hg respectively (Figs 1 and 2).

It was found that 66 out of 100 patients in both the study groups became normotensive. They were 38 in group 1 and 28 in group 2.

The mean systolic and diastolic blood pressures of each study group were compared within the same group by using paired sample t test (p <0.05).
As a final comparison of the mean systolic and diastolic blood pressures thus obtained, from both the drugs (Enalapril and Losartan) were compared with each other by using independent sample t test (p value of < 0.05).

FIGURE 2: MEAN DIASTOLIC BLOOD PRESSURES OF STUDY GROUP 1 (ENALAPRIL) AND 2 (LOSARTAN) ON VISITS 1 TO 6

Discussion

The evidence based utilization of the antihypertensive drugs is still lacking in our set up, thus selection of either of these agents for treatment is more of physician’s choice.

This study reflected that out of 130 patients who were included in the study initially only 113 patients were strictly compliant with drugs and appeared regularly for all follow up visits. It included 53 patients from Study group 1 and 60 patients in Study group 2. Out of these patients we further considered 50 patients for each Study group without following any special criteria for accepting one patient and rejecting the other.

In international study trials we could appreciate that their results were different from our own study results. In a relatively smaller trial (n = 30) by Chowta et al (2002) losartan was demonstrated to have similar anti hypertensive effect as that of enalapril. It was an open, enalapril controlled study which was conducted in 30 patients with mild to moderate hypertension. Losartan 50 mg was administered to patients for eight weeks. Throughout the study blood pressure was measured every two weeks. After eight weeks losartan was stopped and enalapril 10 mg daily was administered to the same patients after two weeks washout period. The same methodology that was followed for losartan trial was repeated for enalapril trial also. Losartan treatment resulted in a highly significant reduction in the mean sitting diastolic blood pressure. The percentage of responders was slightly more with losartan than enalapril (86.7% vs 76.7%).

Another study was conducted in Hypertension Unit, Department of Internal Medicine, Hospital Clinic, Barcelona, Spain. The aim of this study was to compare the antihypertensive efficacy of the combination enalapril 10 mg/nitrendipine 20 mg vs. losartan 50 mg/hydrochlorothiazide 12.5 mg, assessed by 24-h ambulatory blood pressure monitoring. This multi centre, double-blind, parallel study included 97 hypertensive patients (diastolic blood pressure 90-109 mmHg and daytime > 85 mmHg). After a 2- to 3-week period of single-blind placebo, they were randomized to receive double-blind treatment with Enalapril (n = 48) or Losartan (n = 49) for a 4-week period.

The primary outcome measure was the difference in 24 hours diastolic blood pressure reduction between treatments from randomization to the end of the double-blind period.

No significant differences were observed in the primary outcome measure only the difference in the rate of systolic blood pressure control (< 140 mmHg) reached statistical significance (42.2 vs 22.4%; p = 0.048). It was thus concluded that enalapril and losartan have a similar antihypertensive efficacy, assessed by ambulatory blood pressure monitoring. Enalapril achieved a significantly higher systolic blood pressure control rate, but this was accompanied by an apparently higher proportion of mild adverse events.

Conclusion

Enalapril has significantly better antihypertensive effect than Losartan in patients of mild to moderate hypertension. More studies need to be conducted on the same topic in our local set up in order to have clear guidelines for our own consumption.

References


