INTRODUCTION
Hypertension is defined as sustained high blood pressure more than 140/90 mmHg. Hypertension is dangerous because it can lead to strokes, heart attacks, heart failure, or kidney disease.

The goal of hypertension treatment is to lower blood pressure and protect important organs, like brain, heart, and kidneys from damage. It is one of the most important preventable causes of premature death worldwide. Hypertension is estimated to cause 4.5% of current global disease burden and is as prevalent in many developing countries, as in the developed world. Blood pressure-induced cardiovascular risk rises continuously...
across the whole blood pressure range\(^2\).

It is ‘the silent killer’ as often asymptomatic and one of the most common cardiovascular diseases in America. There are approximately 73 million people suffer from high blood pressure in the United States\(^1\). Out of them 14.8% population is untreated and 26.2% is inadequately treated, in another 31.4% the condition remains undiagnosed. Pathophysiology of high blood pressure is unknown in 95% of the cases and this is called essential blood pressure where exact cause cannot be pinpointed. The hereditary factor may be one reason for essential hypertension. Diet and lifestyle also play a role in the pathophysiology. Overweight, irregular sleep, excessive salt intake is contributing factors.

The development of arteriosclerosis and atherosclerosis are also affected by hypertension. Hypertension reduces the elasticity of arteries causing other secondary conditions which lead to decrease blood flow and ischemic diseases\(^3\).

The complications of hypertension principally involve the central nervous system, retina, heart and kidneys\(^4\).

Hypertensive patients should be encouraged to make lifestyle modifications, such as eating a healthier diet, quitting smoking and getting more exercise\(^5\), when used properly, drug therapy can control the progression of end-organ damage\(^6\).

Atenolol was commonly used cardiovascular drug introduced in 1976 as replacement of propranolol in the treatment of hypertension. The drug works by slowing down the heart rate and reducing workload. It is cardio selective beta-blocker and it has no partial agonist or membrane stabilizing activity. Its oral bioavailability being of 50-60% and half life of atenolol is about 6 hours allowing once daily dosing\(^5\).

Losartan is the prototype angiotension receptor blocking (ARB) drug. Their pharmacological effects are similar to those ACE inhibitors in that they produce vasodilatation and block aldosterone secretion thus lowering blood pressure\(^6\).

**MATERIAL AND METHODS**

This study was conducted in the medical out patients department (OPD) of Jinnah post graduate medical centre Karachi from January 2007 to June 2007.

**Type of study**

Comparative study.

**Methodology**

There were 60 patients previously untreated with mild and moderate essential hypertension, were registered for study.

The selected patients were divided into three groups.

- **Group A**: Atenolol prescribed in 20 registered patients.
- **Group B**: Losartan prescribed 20 registered patients.
- **Group C**: Atenolol and Losartan prescribed in 20 registered patients.

In this study, the doses of two selected anti-hypertensive drugs were increased to 100mg of both drugs, when blood pressure not controlled. The therapeutically, our target was 120-140/80-90mmHg reached at 4 months for all patients. There were 42 males and 18 females and age rage between 25-65 years.

**STATISTICAL ANALYSIS**

All variables have been expressed in mean ± standard deviation. The observation of the parameters was recorded in a tabulated form and repeated measure analysis of variance was to observe treatments and days effect.

**RESULTS**

Total patients included in study were sixty and divided into three groups A, B and C. The baseline score of Atenolol group was systolic blood pressure 182±19, and diastolic blood pressure was 104.5±11. The reduction of blood pressure were in month of treatment with atenolol in 20 patients systolic176±18, and diastolic 99±8, in two
months the systolic blood pressure 168±18 and diastolic 95±6, in 3 months of treatment systolic blood pressure 158±18, and diastolic 91±5, and in 4 months of treatment systolic blood pressure 174±20, diastolic blood pressure 103±9. The reduction of blood pressure were in one month of treatment with Losartan in 20 patients systolic 166±19, and diastolic 97±9, in two months the systolic blood pressure 157±18 and diastolic 94±7, in 3 months of treatment systolic blood pressure 150±15, and diastolic 90±6, and in 4 months of treatment systolic blood pressure 138±13, diastolic blood pressure 87±4. The baseline score of Atenolol and Losartan group was systolic blood pressure 168±11.9, and diastolic blood pressure was 104.5±10. The reduction of blood pressure were in one month of treatment with Losartan and Atenolol in 20 patients systolic blood pressure was 154±10, and diastolic blood pressure was 97±6, in 3 months of treatment systolic blood pressure 128±4, and diastolic 85±5, and in 4 months of treatment systolic blood pressure 115±4.6, diastolic blood pressure 75±4.7 table no. I.

The treatment effect is significantly different on systolic blood pressure (p<0.001) and diastolic blood pressure (0.036).

Days significantly decreased the systolic and diastolic blood pressure Fig-1 and 2.

Side effects observed in 2 (10%) patients from group C, 8(40%) in group A and 4 (20%) in group B. This showed that combination therapy of both Atenolol and Losartan is more effective and having fewer side effects as compared to single drug therapy. More so combination therapy took less duration to control hypertension in majority of patients in table-II.

| Table II. Adverse effects of drugs side effects were observed and reported by patients |
|---------------------------------|-----------------|-----------------|-----------------|
| Adverse effects | Atenolol | Losartan | Combination of both drugs |
| Fatigue | 3(15%) | - | - |
| Orthostatic Hypotension | - | 3(15%) | 1(5%) |
| Leg pain | 3(15%) | - | - |
| Weight Loss | - | 1(5%) | 1(5%) |
| Impotency | 1(5%) | - | - |
| Cold extremities | 1(5%) | - | - |
| Total Reactions | 8(40%) | 4(20%) | 2(10%) |

**DISCUSSION**

Total patients included in this study were sixty and divided into three groups. The baseline score of all groups were showed systolic blood pressure 168±11.9, and diastolic blood pressure was 99.7±11. After 4 months of treatment with atenolol systolic blood pressure 147±17, diastolic blood pressure 87±4 were decreased. Losartan decreased systolic blood pressure 138±13, diastolic blood pressure 87±4 in 4 months of treatment. These results were significant statistically. There were different
in efficacy of Losartan and atenolol showed Losartan was more efficacious than atenolol. The combined therapy decreased systolic blood pressure 115±4.6, diastolic blood pressure 75±4.7. Side effects observed in 2 (10%) patients from group C, 8 (40%) in group A and 4 (20%) in group B. In our study combination therapy proved very effective in controlling hypertension than mono therapy and also fewer side effects.

Our study matched with the study of Norman 1999, in which Losartan based antihypertensive regimen reduced cardiovascular morbidity and mortality and cardiovascular deaths, stroke, and myocardial infarction. His data suggested Losartan based treatment is more effective than atenolol-based treatment of patients in hypertension. In our study Losartan was much more effective and less side effects that is only four reactions as compared to 8 reactions in atenolol.

This study matched with the study of Keller 2005, in which author compared efficacy and tolerability of Losartan and atenolol in patients with mild to moderate essential hypertension. This is consistent with our study as eight (40%) adverse reactions were noted in patients taking atenolol. Losartan was a efficacious then atenolol in reduction of blood pressure and was well tolerated. In our study group B results were better than group A.

This study match with study of Lindholm (2002) in which the mean blood pressure fell to 146/79 mm Hg (17/11) in Losartan patients and 148/79 mm Hg (19/11) in atenolol patients. The primary endpoint occurred in 103 patients assigned Losartan (n=586) and 139 assigned atenolol (n=609); relative risk 0.76 (95% CI 0.58-.98), p=0.031. 38 and 61 patients in the Losartan and atenolol groups, respectively, died from cardiovascular disease; 0.63 (0.42-0.95), p=0.028. Mortality from all causes was 63 and 104 in Losartan and atenolol groups, respectively; 0.61 (0.45-0.84), p=0.002. Losartan was more effective than atenolol in reducing cardiovascular morbidity and mortality as well as mortality from all causes in patients with hypertension, diabetes, and LVH. Losartan seems to have benefits beyond blood pressure reduction. In our study the baseline score of both groups were showed systolic blood pressure 182±19, and diastolic blood pressure was decreased. Losartan decreased systolic blood pressure 138±13, diastolic blood pressure 87±4 were decreased. Losartan was more efficacious than atenolol based treatment is more efficacious than atenolol. Combined therapy is more efficacious but costly.

Our study consisted with the study of Ferrario 2004 Losartan, however, reduced the risk of stroke by 25% compared with atenolol (p=0.001). For a subgroup of patients with isolated systolic hypertension, Losartan...
reduced the risk of stroke by 40%\textsuperscript{10}. After 4 months of treatment with atenolol systolic blood pressure 141±11.4, diastolic blood pressure 91±3.8 were decreased, these results were significant statistically. Losartan decreased systolic blood pressure 126±5.0, diastolic blood pressure 85±4.5 in 4 months of treatment, these results were significant statistically.

In the study of Farsang, 2000 similar significant reductions in SiSBPs (sitting systolic blood pressure) (mean±SD) were obtained with 50 mg Losartan and 50 mg atenolol, from 173.7±10.3 and 173.5±10.7 mmHg at baseline to 149.0±15.5 and 148.2±15.3 mmHg after 16 weeks of Losartan or atenolol treatment, respectively. Sixty-seven percent of the Losartan-treated and 64% of the atenolol-treated patients remained on monotherapy throughout the study. Only 1.5% of the Losartan-treated patients withdrew because of a clinical adverse event (CAE) compared with 7.2% in the atenolol-treatment group. Drug-related CAEs were observed significantly more frequently with atenolol than with Losartan treatment (20.3 versus 10.4%). Losartan 50 mg and 50 mg atenolol produced comparable reductions in SiSBP in patients with ISH but Losartan was better tolerated. This is the first demonstration of the therapeutic value of selective angiotensin II receptor blockade with Losartan in the treatment of ISH (isolated systolic blood pressure)\textsuperscript{11}; in our study After 4 months of treatment with atenolol systolic blood pressure 141±11.4, diastolic blood pressure 91±3.8 were decreased, these results were significant statistically. Losartan decreased systolic blood pressure 126±5.0, diastolic blood pressure 85±4.5 in 4 months of treatment, these results were significant statistically.

CONCLUSION
Patients showed significantly better results on combination therapy of Atenolol and Losartan than monotherapy. Losartan was better than Atenolol in reduction of hypertension.

REFERENCES
11. Farsang, Csaba; Garcia-Puig, Juan; Niegoskwa, Joanna; Baiz, Adalberto Quintero; Vrijens The efficacy and tolerability of losartan versus atenolol in patients with isolated systolic hypertension. Journal of Hypertension: 2000 - Volume 18 - Issue 6-p 795-801.
The amendment of the Professional Vol:17, No.02 (Prof-1450) titled: Dermatological disorders; psychiatric co-morbidity on page 334 is as under;

**INCORRECT**

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