**ORIGINAL ARTICLE**

# Comparative Study of Anti Hypertensive Drugs

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## ABSTRACT

**Objective:** To evaluate the effectiveness of antihypertensive drugs.
**Materials and method:** These four drugs were given to patients having hypertension. There were made four groups, each group consisted of 75 patients, total number of patients were 300, the study period was up to 60 days. The blood pressure was recorded at 15 days, 30 days and 60 days.
**Result:** In all the groups the blood pressure decreased and maximum decrease was found among the patients with ibesartan, the drug ibesatan seems to be more effective as compared to other drugs.
**Conclusion:** Ibesatran is more effective drug according to our study. However more studies are required to reach authentic conclusion.
**Keywords:** Antihypertensive drugs, irbesartan, amlodipine, atenolol, captopril.

## INTRODUCTION

The risk of atherosclerotic coronary heart disease is related to the increased levels of systolic and diastolic blood pressure. The prevalence of left ventricular hypertrophy increases with age and is higher in patients with hypertension[1] (Frohlich et al 1992).

Blood pressure can be defined as the force exerted by the blood against any unit area o the vessel wall. The systolic arterial pressure is the Maximum pressure in the arteries during systolic and diastolic pressure depends upon cardiac output and peripheral vascular resistance[2] (Guyton et al 2006).

It has long been recognized that mortality and morbidity increase as both systolic and diastolic blood pressure rise and that in individuals over age 50, the systolic blood pressure is a better predictor of complications[3] (Massie 2006).

Several epidemiologic studies have declared the relations of hypertension are consistent in both man & women in young, middle aged and older subjects among different and racial and ethnic groups and within countries[4] (Vasan et al 2001). The elevated blood pressure is said to be abnormal when it is associated with a clear increase in morbidity, this level varies with age, sex, race, and country, the diastolic BP in young adult above 100mmHq and or systolic BP above 160mmHg is taken as definitely hypertensive and diastolic BP above 95 mm Hg is regarded as probably hypertensive[5] (Chobaxian et al 2003).

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A number of physiological mechanisms are involved in the maintenance of normal blood pressure and their derangement may play an important role in the development of essential hypertension. The factors taking part are genetics, endothelial dysfunction[6] (Schiffrin et al 2000).

There may be structural thickening of the vessel walls or functional vasoconstriction[7] (Vikrant 2001). Population studies suggest that the blood pressure is a continuous variable with no absolute dividing line between normal and abnormal[8] (Pastor-Barriuso et al 2003). Hypertension is a heterogenous disorder in which patients can be stratified by different pathophysiological characteristics that have a direct bearing on risk of cardiovascular complications[1] (Frohlic et al 2003). Hypertension can be classified as either essential hypertension indicates that no specific medical cause can be found to explain a patient's condition. About 90-95% of hypertension is essential hypertension[10] (Carretero 2000).

## MATERIAL & METHOD

Total 300 Three hundred patients were selected and enrolled after life style modification for 1 month i.e., weight reduction adaptation of DASH eating plan, dietary sodium restriction and regular physical activity such as brisk walk at best 30 minutes per day and distributed into four groups i.e., Amlodipine, Atenolol, captopiril and irbesartan groups each group comprising 75 patients. Patients of either sex, ages between 25 to 75 years with newly diagnosed essential hypertension, in whom life style intervention done for at least one month with in controlled blood pressure was included in the study. Patients having history of allergy to test groups of anti hypertensives, with known history of MI, coronary artery disease or instable angina, pregnant and lactating women, with hepatic disfunction already taking NSAIDS, patients

with asthmatic history, patients who showed poor compliance during research and patients already taking anti hypertensive drugs were excluded from the study. BP was recorded three times a day mean reading was determined.

## RESULTS

The patients with Amlodipine at day 0 had systolic BP mean 154.2±SEM 1.62±at day 30 they had systolic BP 152.0±SEM 1.94, at day 60 they had SBP 143.8±1.98% decrease in SBP was 4.7% (Table 1). The patients with Atenolol had SBP at start 157.8± 2.72 at 30 days they had 146.6±2.91, at 60 days they had 137.2±2.40 and there was decrease in percentage 8.6% (Table 1). With captopril at start the SBP was 157.3±2.43 at day 30 it was 148.6±2.51 at day 60 the SBP was 139.8±2.98, the difference remained 7.7% (Table1). With Irbesartain the SBP was 160.2±1.97 at 30 days the same was 145.8±1.80, at 60 days same was 131.4±2.28 the difference percentage was 13.4) (Table 1).

The diastolic BP at the start of treatment with Amloipic was 96±0.96 at day 30 it was 93±1.63 at day 60 the same was 88.6±1.86 difference remained 04.20% (Table 2). With Atenolol DBP was 97.6±1.53 at day 30 it was 91.8±1.58 at day 60 it was 87.2±1.78 the difference was 5.46% (Table 2). With captopril at the start the DBP was at start 97.4±1.05 at day 30 DBP was 91±1.42 at day 60 it was 87.6±1.94 the difference was 7% (Table 2). With Irbesartan at start the DBP was 97.2±1.45mmHg at 30 days the same was 93.2±1.44 at day 60 the same was 85.6±1.72 the difference was 11.30% (Table 2). The percentage of side effects is shown in table 3.

Table 1: Changes in mean systolic BP from day 0 to day 60

| Groups | Day 0(mmHg) | Day 30(mmHg) | Day 60(mmHg) | % Decrease(mmHg) Day 0-60 |
|---|---|---|---|---|
| Amlodipine dose(n=75) | 154.2±1.62 | 152.0±1.94 | °143.8±1.98 | 04.7% |
| Atenolol dose(n=75) | 157.8±2.72 | *146.6±2.91 | °137.2±2.40 | 08.6% |
| Captopril dose(n=75) | 157.3±2.43 | *148.6±2.51 | °139.8±2.98 | 07.7% |
| Irbesartan dose(n=75) | 160.2±1.97 | *145.8±1.80 | °131.4±2.28 | 13.4% |

*Mean ± SEM: *P<0.01 significantly decreases from Day 0. °P<0.01 significantly decreases from Day 0 and Day 30.*

Table 2: Changes in mean diastolic BP from day 0 to day 60

| Groups | Day 0(mmHg) | Day 30(mmHg) | Day 60(mmHg) | % Decrease(mmHg) Day 0-60 |
|---|---|---|---|---|
| Amlodipine dose(n=75) | 96.0±0.96 | 93.0±1.63 | *88.6±1.86 | 04.20% |
| Atenolol dose(n=75) | 97.6±1.53 | 91.8±1.58 | **87.2±1.78 | 05.46% |
| Captopril dose(n=75) | 97.4±1.05 | 91.0±1.42 | **87.6±1.94 | 07.00% |
| Irbesartan dose(n=75) | 97.2±1.45 | 93.2±1.44 | **85.6±1.72 | 11.30% |

*Mean ± SEM: *P < 0.01 significantly decreases from Day 0. **P < 0.01 significantly decreases from Day 0 and Day 30.*

Table 3: Percentage of side effects with various antihypertensives

| Side effect | Amlodipine | Atenolol | Captopril | Irbesartan |
|---|---|---|---|---|
| Drowsiness | 04% | 08% | 04% | 02% |
| Headache | 01% | 08% | 04% | 32% |
| Lethargy | 04% | 06% | 03% | 02% |
| Weakness | 01% | 01% | 0% | 01% |
| Abdominal pain | 0% | 0% | 01% | 01% |
| Diarrhoea | 0% | 0% | 0% | 0% |
| Backache | 0% | 0% | 0% | 01% |
| Dry cough | 0% | 0% | 30% | 05% |
| Weight loss | 0% | 02% | 01% | 0% |

## DISCUSSION

A Number of agents that act via different mechanism are now available for the treatment of hypertension. This broad choice is very helpful since essential hypertension is a heterogenous disease which explains why it is still difficult to find or the individual hypertensive patient a drug regimen that is at the same time efficacious and well tolerated. The Amlodipine decrease the SBP as shown in table 1 and DBP was also decreased with P value atenolol has also decreased both SBP & DBP with P <0.010. In captopril group both systolic and diastolic BP decresed with P value <0.010. In Irbesartan group both the SBP and DBP decreased with P Value <0.010. Ibesarten a long acting antihypertensive receptor antagomist was compared with atenolol. Irbesartan was found more effective in lowering both SBP and DBP as campared to atenolol. This finding was found to be consistant with[11,12] et al 1998 & warber 2001.

The antihypertensive study of atenolol observed in present study can be compared with[12] (Dahlofet all 2002). Freshman[14] et al 1988 concluded that the efficacy and safety of amlodipine is less than that of Atenolol in patients with mild to moderate essential hypertension. Which is in accordance with our study which also showed higher efficacy of atenolol in reducing both SBP and DBP as compared to Amlodipine[14].

Our study show, dose related efficacy of Irbesartan for hypertension, results of this study showed higher efficacy of Irbesartan at higher disease as compared to normal recommended dose there has been maximum reduction both in DBP and SBP the results can be compared with reves[15] et al 1998. Irbesartan is found to be an effective and safe antihypertensive agent in present study when given once daily for the treatment of mild to moderate hypertension this study can be compared within pool[16] et al 1998.

## CONSULION

It has been found that Irbesartan is an effective and better drug for treatment of hypertension.

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