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ORIGINAL RESEARCH

Assessment of efficacy of different combination of antihypertensive drugs in the treatment of arterial hypertension

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ABSTRACT

Background: Despite the well-established epidemiological link between high blood pressure and cardiovascular morbidity and mortality, and the substantial evidence supporting the need for antihypertensive therapy, blood pressure control remains inadequate in many cases. Hence; the present study was conducted for comparing the efficacy of different combination of antihypertensive drugs in the treatment of arterial hypertension. **Materials & methods:** The present study was conducted for comparing the efficacy of different combination of antihypertensive drugs in the treatment of arterial hypertension. A total of 60 patients with presence of arterial hypertension were enrolled. Complete demographic clinical details of all the patients were obtained. A total of three study groups were formed as follows: Group 1: Calcium Channel Blocker (Amlodipine) + Angiotensin Receptor Blocker (Valsartan),Group 2: Angiotensin Receptor Blocker (Valsartan) + Diuretic (Hydrochlorothiazide), and Group 3: Calcium Channel Blocker (Amlodipine) + Angiotensin Receptor Blocker (Valsartan) + Diuretic (Hydrochlorothiazide). Comparison was made among three study groups. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. **Results:** Mean age of the patients of group A, group B and group C was 42.3 years, 45.9 years and 44.1 years respectively. All the three study groups showed significant improvement in the blood pressure posttreatment. However; while comparing in between the individual study groups, maximum improvement was seen among patients of group A. **Conclusion:**

Key words: Antihypertensive, Arterial hypertension

INTRODUCTION

The World Health Organization reports that 54% of strokes and 47% of ischemic heart disease cases can be attributed directly to high blood pressure, positioning it as a significant risk factor for cardiovascular disease and mortality. The notable decline in stroke incidence over recent decades can largely be attributed to improvements in blood pressure management.[1- 3] Despite the well-established epidemiological link between high blood pressure and cardiovascular morbidity and mortality, and the substantial evidence supporting the need for antihypertensive therapy, blood pressure control remains inadequate in many cases. This inadequacy may stem from a lack of blood pressure monitoring, insufficient physician response to elevated readings, suboptimal treatment regimens, or patients' non-adherence to prescribed medications.[3- 5] Excessive weight gain is associated with HTN, and obesity is closely related to conditions that can be secondary causes of HTN such as obstructive sleep apnea and/or the frequent use of nonsteroidal anti-inflammatory drugs due to overweight-related early arthritis. Reducing weight towards an ideal body weight decreases BP. Weight loss also improves the efficacy of antihypertensive medications. Weight loss should be achieved through a multidisciplinary approach, including dietary advice, motivational counseling, and regular exercise. In patients with overweight or obesity, a reduction of weight in 10 kg is associated with a decrease of systolic BP of 6 and 4.6 mmHg in diastolic BP. [6- 8]Hence; the present study was conducted for comparing the efficacy of different combination of antihypertensive drugs in the treatment of arterial hypertension.

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MATERIALS & METHODS

The present study was conducted for comparing the efficacy of different combination of antihypertensive drugs in the treatment of arterial hypertension. A total of 60 patients with presence of arterial hypertension were enrolled. Complete demographic clinical details of all the patients were obtained.

A total of three study groups were formed as follows:

Group 1: Calcium Channel Blocker (Amlodipine) + Angiotensin Receptor Blocker (Valsartan),

Group 2: Angiotensin Receptor Blocker (Valsartan) + Diuretic (Hydrochlorothiazide), and

Group 3: Calcium Channel Blocker (Amlodipine) + Angiotensin Receptor Blocker (Valsartan) + Diuretic (Hydrochlorothiazide)

The assessment of non-invasive arterial pressure was conducted utilizing a sphygmomanometer alongside a digital device. Measurements of systolic and diastolic arterial pressures, as well as heart rhythm, were recorded in relation to various combinations of antihypertensive medications administered to the patients. The auscultatory method, commonly referred to as the Korotkoff technique, was employed for the determination of blood pressure. Pretreatment and posttreatment blood pressure was evaluated. Comparison was made among three study groups. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

RESULTS

Mean age of the patients of group A, group B and group C was 42.3 years, 45.9 years and 44.1 years respectively. All the three study groups showed significant improvement in the blood pressure posttreatment. However; while comparing in between the individual study groups, maximum improvement was seen among patients of group A.

Table 1: Comparison of blood pressure

Study group	SBP before treatment	SBP after treatment	DBP before treatment	DBP after treatment
Group A	177.2	112.3	110.3	80.2
Group B	176.3	118.5	108.4	80.3
Group C	170.9	120.8	104.9	81.9

Table 1: Comparison of Total cholesterol

Study group	Total cholesterol before treatment (mg/dL)	Total cholesterolafter treatment (mg/dL)
Group A	20.3	18.9
Group B	22.9	20.7
Group C	21.8	19.8

DISCUSSION

Arterial hypertension (AHT) is the leading cause of death worldwide and is one of the most important public health problems. Arterial hypertension is a major cardiovascular risk factor with an increasing incidence. Hypertension is defined by increasing blood pressure (BP) above 140/90mmHg. The World Health Organization (WHO) defined AHT as a persistent increase in systolic BP values above 140mmHg and/or diastolic≥90mmHg in persons not receiving antihypertensive therapy. The 2018 ESH-ESC guidelines recommend that the first therapeutic goal should be to reduce values below 140/90mmHg for all patients. If treatment is well tolerated, values should be lowered to 130/80mmHg or even below for most patients. In most patients below 65 years of age it is recommended to decrease the systolic blood pressure (SBP) in the range 120-129mmHg. The prevalence of AHT increases with age, especially in over 30 years old patients.[5- 8]

Mean age of the patients of group A, group B and group C was 42.3 years, 45.9 years and 44.1 years respectively. All the three study groups showed significant improvement in the blood pressure posttreatment. However; while comparing in between the individual study groups, maximum improvement was seen among patients of group A. Paz MA et al assessed the blood pressure (BP) reduction attributed to antihypertensive drugs and identify characteristics associated with BP decrease.Double-blind, randomized clinical trials whose main result was the reduction in BP by antihypertensive treatment, with study population ≥50 or ≥25 if the study was a crossover, follow-up of at least 8 weeks, and available required data.Two hundred eight trials including 94,305 patients were identified. In monotherapy, most drugs achieved 10 to 15 mm Hg SBP and 8 to 10 mm Hg DBP decreases.Olmesartan/amlodipine, olmesartan/hydrochlorothiazide, felodipine/metoprolol, and valsartan/hydrochlorothiazide were the combinations leading to the greatest mean SBP reductions (>20 mm Hg). Female sex and body mass index >25 kg/m2 were associated with more pronounced SBP and DBP reductions, whereas Afro-American ethnicity was associated with BP reductions smaller than the median. Results were adjusted by study duration, cardiovascular disease, and diabetes mellitus. Still, the estimation was performed using the mean administered doses, which do not exactly match those of the available drug formats.Certain drug combinations achieve BP reductions ranging from 20 to 25/10 to 15 mm Hg. Sex, ethnicity, and obesity are associated with antihypertensive response.[9]

Antihypertensive management should be individualised according to the characteristics of each

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patient, so it is difficult to generalise. However, two meta-analyses have recently found advantages for combinations that include a RASI with a calcium antagonist.The first study included 25,451 patients from eight clinical studies and found that associating a calcium antagonist (dihydropyridine or a nondihydropyridine) with a RASI, whether it is an inhibitor of angiotensin-converting enzyme or an angiotensin receptor blocker, was accompanied by a reduction in cardiovascular mortality, nonfatal myocardial infarction and nonfatal cerebral vascular disease (although not mortality from any cause) when compared with other combinations, despite achieving similar reductions in blood pressure.The second meta-analysis included 49,418 patients from 27 studies and found that, in hypertensive patients with type 2 diabetes mellitus, the combination of a RASI plus a calcium antagonist achieved greater reduction in mortality than monotherapy or other combinations, though it is related to a greater reduction in blood pressure figures with this combination.[10, 11]

CONCLUSION

Combination of Calcium Channel Blocker (Amlodipine) + Angiotensin Receptor Blocker (Valsartan) showed maximum efficacy.

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