

Comparative Effect of Valsartan and Amlodipine on Serum Lipoproteins (LDL and HDL) Levels among Hypertensive Patients

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ABSTRACT

Introduction: Hypertension is a modifiable risk factor for cardiovascular diseases and is associated with several metabolic disorders like dyslipidemia. Drugs that control blood pressure effectively can increase the potentially atherogenic serum low-density lipoprotein (LDL) cholesterol fraction and triglycerides. In view of the available literature, the present study was undertaken to compare the effect of Valsartan and Amlodipine on LDL and HDL levels among hypertensive patients.

Material and Methods: The present study was conducted among fifty patients diagnosed with mild or moderate essential hypertension. Blood pressure was controlled in twenty-five patients with Amlodipine (group A) and twenty-five patients with valsartan (group B) and their adaptation to the treatment was monitored. The patients were monitored for a period of 12 weeks and serum lipoproteins (HDL, LDL) was carried out at 0 week and then after 12 weeks.

Results: Mean serum LDL-Cholesterol level was 146.16 ± 8.12 in the group A and 148.58 ± 6.39 in group B. After 3 months of administration of Amlodipine it was significantly reduced to 127.21 ± 4.29 in group A and after 3 months of administration of Valsartan it was significantly reduced to 142.16 ± 10.05 in group B. Mean serum HDL-Cholesterol level was non-significantly reduced in both the groups.

Conclusion: The present study concluded that in addition to the marked decrease in blood pressure, both Valsartan and Amlodipine reported beneficial effect on LDL level and in comparison to Valsartan, Amlodipine reported more beneficial effect on reduction of LDL levels.

Keywords: Amlodipine; Dyslipidemia; Serum lipoproteins; Valsartan.

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INTRODUCTION

Hypertension is a modifiable risk factor for cardiovascular diseases and is associated with several metabolic disorders like dyslipidemia. Higher levels of triglyceride and low-density lipoprotein (LDL) are quite strong factors for the development of cardiovascular diseases.¹

Hypercholesterolemia is not only a co-existence but an independent and causal relationship is present between lipids and hypertension and there is a physiologic rationale and evidence for statins use especially in patients with complicated hypertension or in patients with more than two risk factors. The ultimate goal of antihypertensive therapy is cardiovascular risk reduction. Thus, whilst blood pressure lowering is undoubtedly beneficial, treatment must go beyond blood pressure and the most effective way is to add a statin.²

High levels of LDL cholesterol, increases risk of heart disease

whereas high levels of HDL cholesterol prevents plaque buildup in the arteries by transporting the LDL cholesterol out of the blood to the liver and thus eliminates from the body.³

Drugs that control blood pressure effectively, such as thiazide-type diuretics can increase the potentially atherogenic serum low-density lipoprotein (LDL) cholesterol fraction and triglycerides. Beta blockers without partial intrinsic sympathomimetic activity increase serum triglycerides and tend to lower the potentially antiatherogenic high-density lipoprotein (HDL) cholesterol. Calcium channel blockers, angiotensin converting-enzyme inhibitors and alpha 1-receptor blockers do not adversely affect lipoprotein or carbohydrate profiles.⁴ In view of the available literature, the present study was undertaken to compare the effect of Valsartan and Amlodipine on LDL and HDL levels among hypertensive patients.

MATERIAL AND METHODS

The present study was conducted among fifty patients diagnosed with mild or moderate essential hypertension. Blood pressure was controlled in twenty-five patients with 5 mg or 10 mg dose of Amlodipine (group A) and twenty-five patients were given a daily dose of 80 mg or 160 mg of valsartan orally (group B) and their adaptation to the treatment was monitored.

Patients were recalled at 2 weeks, 6 weeks and 12 weeks and blood pressure was observed at each visit. The patients were monitored for a period of 12 weeks and serum lipoproteins (HDL, LDL) was carried out at 0 week and then after 12 weeks. Data so obtained was analysed using SPSS version 16 and statistically analysis was carried out using Chi-square test with p value <0.05 considered as significant value.

Table 1: Variation in the levels of serum Lipoproteins (LDL and HDL)

Serum Lipoproteins	Group A (Amlodipine)			Group B (Valsartan)		
	At 0 month	At 3 months	p-value	At 0 month	At 3 months	p-value
LDL	146.16±8.12	127.21±4.29	< 0.05	148.58 ± 6.39	142.16 ± 10.05	< 0.05
HDL	42.04±2.05	41.21±1.06	>0.05	41.59 ± 2.06	41.35 ± 2.59	>0.05

RESULTS

The mean age of patients in the present study was 52.12±5.13 years. The mean systolic blood pressure in the study group was 147.28 ± 4.03 and mean diastolic blood pressure was 95.67 ± 1.02 at the time of initiation of the medicinal therapy. After 3 months, mean the systolic blood pressure was 129.12 ± 1.16 and diastolic blood pressure was 82.00±1.15. Mean serum LDL-Cholesterol level was 146.16±8.12 in the group A and 148.58 ± 6.39 in group B. After 3 months of administration of Amlodipine it was significantly reduced to 127.21±4.29 in group A and after 3 months of administration of Valsartan it was significantly reduced to 142.16 ± 10.05 in group B. On comparing between the groups, a significant reduction of LDL (p< 0.05) in amlodipine group as compared to valsartan group was found (table 1).

Mean serum HDL- Cholesterol level was 42.04±2.05 in the group A and 41.59 ± 2.06 in group B. After 3 months of administration of Amlodipine and Valsartan, it was non-significantly reduced in both the groups (table 1).

DISCUSSION

Effective blood pressure control has led to a decrease in cerebrovascular morbidity and mortality.⁴ Increased plasma LDL-C concentration is an important risk factor for coronary artery disease.⁵ The beneficial effects of anti-hypertensive agents on the cardiovascular system can be counterbalanced by the induction of metabolic disorders, such as hyperlipidaemia.⁶ The present study was undertaken to compare the effect of Valsartan (angiotensin II receptor antagonist) and Amlodipine (Calcium channel blocker) on LDL and HDL levels among hypertensive patients and the study reported beneficial effect on LDL level and non-significant effect on HDL levels. Atacan I et al⁷ studied curative effect of valsartan on hypertension and lipid profiles among hypertensive patients and reported that the use of valsartan reduced LDL levels. Chrysant SG et al⁸ evaluated the lipid profiles of hypertensive patients and revealed higher HDL levels (P less than .05) and lower CHOL:HDL and LDL:HDL ratios (P less than .01) in Amlodipine treated patients than placebo-treated patients.

Arslan Z et al¹ investigated the effects of valsartan and amlodipine on the lipid profile and observed a beneficial effect of amlodipine on the lipid profile with a significant reduction of LDL compared to valsartan. Salehi I et al⁹ conducted an animal study to evaluate the effects of amlodipine and revealed that amlodipine decreased

oxidative stress in the heart and blood and improved the lipid profile in cholesterol fed rabbits and in view of this, it may be considered a useful tool for the reduction of oxidative stress and improvement of lipid profiles in diseases related to atherosclerosis.

Hanefeld M et al⁶ evaluated the effect of the valsartan, on the lipid profile in patients with mild-to-moderate hypertension and it significantly reduced total and LDL cholesterol levels in addition to the marked decrease in blood pressure whereas no significant changes were observed in the levels of triglycerides, high-density lipoprotein cholesterol, very low-density lipoprotein (VLDL) triglycerides, VLDL cholesterol and apolipoprotein B after valsartan treatment.

Increase in the levels of serum cholesterol, serum-triglycerides and lowered values of HDL adversely affect the process of atherosclerosis, increasing the risk of coronary artery disease. This particular fact that calcium channel blockers do not produce deleterious effect on lipid profile seems to be advantageous over beta blockers which are known to affect the lipid profile adversely.¹⁰

CONCLUSION

The present study concluded that in addition to the marked decrease in blood pressure, both Valsartan and Amlodipine reported beneficial effect on LDL level and non-significant effect on HDL levels. In comparison to Valsartan, Amlodipine reported more beneficial effect on reduction of LDL levels.

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