Hyperlipidemia Associations with Hypertension Medications

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Abstract

Simultaneity of hypertension and hyperlipidemia as added risk factors for renal and cardiovascular disease cannot be approached without considering concomitant effect of some antihypertensive agents causing secondary hypercholesterolemia or hypertriglyceridemia. Hypertension and atherosclerosis are two important and related risk factors associated with the morbidity and mortality of patients with chronic renal failure. Increased prevalence of hypertensive nephropathy as a major cause of end stage renal disease has been reported. Among these patients, the cardiovascular morbidity is estimated around 10 to 20 times that observed in the general population and may be present in half of patients under dialysis. Hypertension accelerates the development of atherosclerosis. On the other hand, dyslipidemias are associated to a higher damage of hypertensive renal disease, aswell as to myocardial hypertrophy and to the incidence of cardiovascular events in hypertensive patients. Treatment of hypertension can modify the lipid profile and atherosclerosis induced by hyperlipidemia.

Keywords: Dyslipidemia; Hypertension; Risk factors; Cardiovascular disease; Prevention; Atherosclerosis

Abbreviations: LDL-c: Low Density Lipoprotein Cholesterol; TC: Total Cholesterol; VLDL-c: Very Low Density Lipoprotein Cholesterol

Introduction

In order to adequately address the treatment of hypertensive patients with dyslipidemia, we have to remember the importance of these two pathologies as risk factors for coronary heart disease. In addition to proven the two main factors [1], Systemic Arterial Hypertension and Dyslipidemia act synergistically, increasing cardiovascular risk [2]. Epidemiological studies [3-5] have shown that the risk of cardiovascular mortality increases with cholesterol levels - in a 55-year-old man, the risk is 0.6%/year for a cholesterol level of 245 mg/dL, dropping to 0.2% if the cholesterol level is reduced to 180 mg/dL. Published data [6] showed that 40% of all individuals with blood pressure greater than 140/90 mmHg or using antihypertensive mediation have serum levels of total cholesterol (TC) greater than 240 mg/dL; and 46% of those with TC > 240 mg/dL also have blood pressure greater than 140/90 mmHg. A frequent association of hypertriglyceridemia and hypoalphalipoproteinemia is also reported as elements of plurimetabolic syndrome described by Reaven, known as X Syndrome. Another relevant data in the recognition of these patients is the presence of metabolic alterations of glucose intolerance and lipid alterations resulting from the treatment of hypertension, reflecting possible adverse effects of hypotensor agents [7,8] on insulin sensitivity; obesity and sedentary lifestyle, factors that can be modified, contribute to a condition conducive to atherogenesis.

Effects of Antihypertensive Medicines

As previously reported, lipid and glucose intolerance alterations are more common in treated hypertensive patients, possibly reflecting the adverse effects of hypotensive agents [9,10] on insulin sensitivity. The possible cause of this condition are diuretics and beta-blockers.
Diuretics [11]

Thiazides are those who have proven to perform a negative action in the lipid profile; act by increasing the action of lipoprotein lipase, which hydrolyzes triglycerides and VLDL-c lipoproteins, increasing the production of LDL-c and TC. These changes are discrete and may return to normal with suspension of treatment.

Beta-blockers

Act by inhibiting the activity of adenyl cyclase in fatty cells, reducing hydrolysis of fatty acids and triglycerides; TC elevation (LDL-c and VLDL-c) and triglycerides [12]. As endothelial injury is the common basis for the actions of these two pathologies in the arterial wall, the ideal is that we try to use drugs that, in addition to not interfering in a negative metabolic form, have an antiproliferative and/or protective role on the arteries [13]. Calcium antagonists and angiotensin-converting enzyme inhibitors are the ones that best fit as a treatment option for dyslipemic hypertensive patients [8,14,15] (Table 1).

Drug Interactions

The known or theoretically possible interactions to occur are [17,18]:

- a) Reduction of LDL-c with the use of sequelae of bile acids and thiazide diuretics.
- b) Interference in the action of various antihypertensives when used in conjunction with nicotinic acid, aspirin or non-steroidal anti-inflammatory agents.
- c) Potential adverse effect of thiazide diuretics on hyperglycemia when administered together with nicotinic acid.

Acknowledgment

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Conflicts of Interest

No conflict of interest.

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