Assess of angiotensin receptor blockers therapy associated to mineralocorticoid receptor antagonists or to calcium channel blockers plus hydrochlorothiazide according central haemodynamic parameters

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Topic(s):
Hypertension: Pharmacotherapy

Citation:
Background: Protective effect of Angiotensin-II Receptor Blockers (ARBs) on major cardiovascular events might be partly independent of the degree of blood pressure reduction. Calcium channel blockers (CCBs), lower arterial pressure by decreasing total peripheral resistance without reducing cardiac output. Hydrochlorothiazide (Hctz) is one of the most commonly prescribed antihypertensive drugs worldwide, but associated with more frequent adverse effects, such as hypokalaemia, hyponatraemia, hyperuricaemia and may increase the glycaemia, It sensitizes the endothelium to the action of angiotensin II, might act on the aldosterone release. The phenomenon of "aldosterone escape" occurs even in the presence of combination therapy with ARBs. The harmful effects of aldosterone are innumerable: induced cardiac and renal fibrosis, sodium and water retention, inflammation, oxidative stress, arrhythmias, glucose intolerance, insulin resistance, among others, that are involved in arterial and myocardium remodelling. Mineralocorticoid Receptor Antagonists (MRAs) therapy improve diastolic function, decrease plasma volume and vascular/myocardial fibrosis.

Purpose: This study aimed to assess the responses of two groups of therapy such as ARBs associated to MRAs or to CCBs+Hctz according to central haemodynamic parameters (CHPs) in hypertensive patients, both genders, with normal kidney function.

Methods: For this cross-sectional retrospective study, data were collected from 391 hypertensive patients who were assisted in the hypertension centre. Female/male 239/152, each gender divided into two groups of therapy: ARB+MRA/ARB+CCB+Hctz. Female 210/29 (average age 57/70) and male 125/27 (average age 55/61). The CHPs were measured with a SphygmoCor System PVX (AtCor-Medical Australia), a validated device employing the high-fidelity technique of applanation tonometry according to established protocols. Also, the difference of Augmentation Index (Diff-AIx) between the observed values and the expected levels was assessed according to normal range by age. No patients had cardiovascular, endocrine, renal and metabolic decompensated diseases.

Results: After measuring the body mass index, waist circumference and heart rate, the two therapy groups were confronted, both genders, had not found the statistically significant difference. The results of CHPs (Central Aortic Pressure, End-Systolic Pressure, Mean Arterial Pressure, Pulse Pressure, Augmentation Pressure), systolic and diastolic blood pressure during association of ARBs+MRAs therapy compared to ARBs+CCBs+Hctz, both genders, showed the lowest values with a highly statistically significant difference. In the female/male the Diff-AIx was found p=0.05/0.04.

Conclusion: These findings suggest that ARBs+MRAs treatment reaches the best haemodynamic conditions because improve the levels of CHPs and arterial stiffness (Diff-AIx) giving an adequate reduction of the stress to the arterial-ventricular coupling.