

IMPROVEMENT OF RENAL HAEMODYNAMICS AND ECHOCARDIOGRAPHIC PARAMETERS IN PHARMACOLOGICAL CONTROLLED HYPERTENSIVES

MARIA LEONARDA	DE ROSA	MD
Luigi Giuseppe	Atripaldi	MD
Sabrina	Iovine	MD
Nicola	Ferrara	MD

Department of Translational Medical Sciences University Federico II

Napoli ITALY

Left ventricular hypertrophy (LVH) is an important factor in the development of long term cardiac complications in hypertension. Reduction of left ventricular mass should therefore be a goal of antihypertensive therapy [1], [2].

In theory, reduction of afterload as a result of blood pressure lowering should reduce myocardial wall stress and lead to a decrease in muscle mass. While regression of LVH occurs with a number of antihypertensive drugs, blood pressure reduction alone does not automatically lead to a decrease in left ventricular mass, nor does the development or regression of cardiac hypertrophy in hypertensive patients depend solely on the level of arterial blood pressure [3], [4].

A study was carried out to evaluate the influence of antihypertensive treatment with combined doses of olmesartan plus amlodipine (40+5 mg daily) compared with those of either drug at a higher dose level (40 or 10 mg daily, respectively) by double-blind, three-way crossover study (balanced Latin square design) in 102 subjects (mean age 51.9 +/- 7.42 years) with essential hypertension. Left ventricular mass and function were evaluated by M-B mode echocardiography, renal function by glomerular filtration rate (GFR) and by serum and 24-h urinary Na⁺ and K⁺ during wash-out period and after 24 weeks of treatment

Results: The supine blood pressure for subjects given placebo was 171/103 mmHg. After 24 weeks of treatment, systolic and diastolic supine blood pressure were significantly lower with 40 mg olmesartan plus 5 mg amlodipine (134/84 mmHg) than with 40 mg olmesartan (137/84 mmHg) or with 10 mg amlodipine (144/85 mmHg). Left ventricular posterior wall and septal thickness were significantly and similarly reduced in all groups. Left ventricular systolic and diastolic end diameters were not significantly changed. Left ventricular mass (LVM) was significantly reduced in Olmesartan plus Amlodipine group and Olmesartan group. GFR was not significantly altered. The 24-h urinary Na⁺ significantly increased with olmesartan more so than amlodipine. The combination was tolerated better than either monotherapy. We observed no clinically significant changes in laboratory variables including blood lipoproteins.

Conclusions: The combination of Amlodipine plus Olmesartan reduced blood pressure more effectively and was better tolerated than other drug alone. All three groups showed similar changes in echocardiographic indices and no change in renal function.

References

1. E.D. Frohlich

Cardiac hypertrophy in hypertension

N Engl J Med, 317 (1987), pp. 813-823

2 .L. Hansson

Reversal of cardiac and vascular hypertrophy by antihypertensive therapy

Am Heart J, 121 (1991), pp. 995-998

3 B.E. Strauer

Ventricular function and coronary hemodynamics in hypertensive heart disease

Am J Cardiol, 44 (1979), pp. 999-1006

4 R.C. Tarazi, F.M. Fouad

Reversal of cardiac hypertrophy by medical treatment

Annu Rev Med, 1 (1985), pp. 407-412

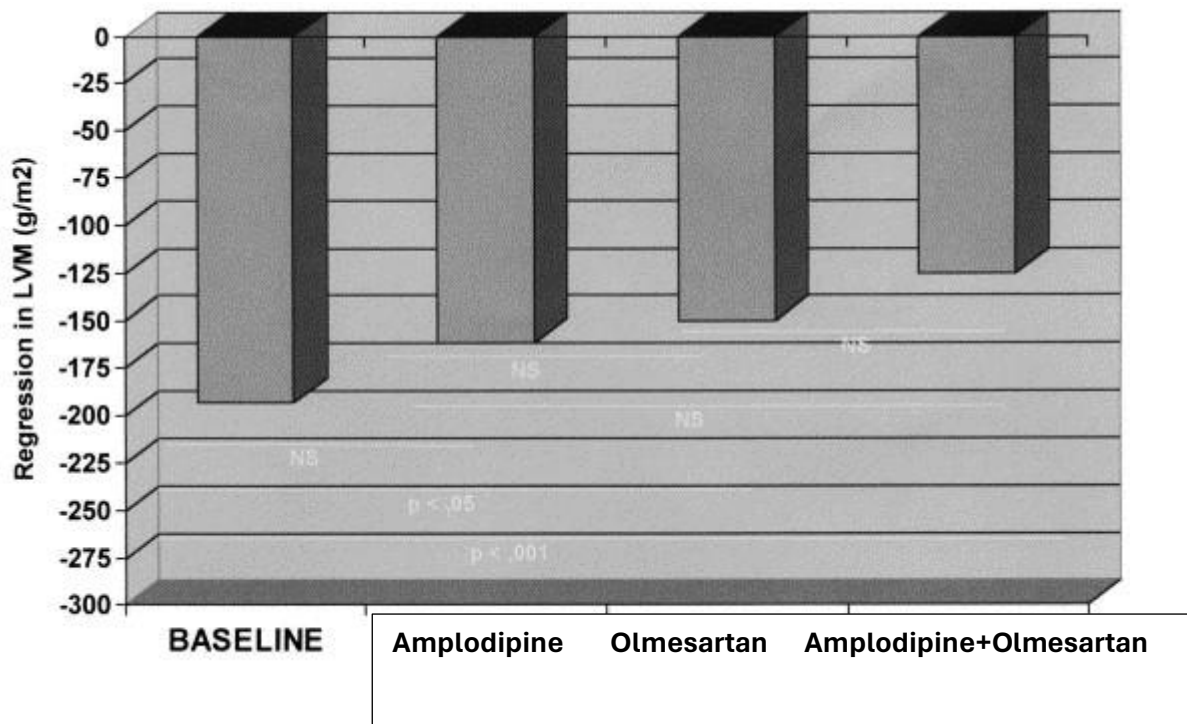


Fig. 1. Both olmesartan monotherapy and a combination of olmesartan plus reduce significantly LVH compared with baseline values.

Renal effects

Table 1 shows that glomerular filtration rate (GFR) did not change significantly compared to baseline, while there was no significant difference between the treatment groups.

Empty Cell	Baseline	Amplodipine	Olmesartan	Olmesartan+Amplodipine	<i>P</i> value
GFR (ml/min)	112.8±21.9	122.8±34.8	144.4±37.8	130.5±34.8	n.s.

Table 2. Echocardiographic findings on left ventricular geometry, before and after 6 months of treatment with amlodipine , olmesartan and olmesartan plus amlodipine , and the difference (adjusted means) compared to baseline (Δ)^a

Empty Cell	Baseline	Amlodipine		Olmesartan		Olmesartan+amlodipine		<i>P</i> value for change
Empty Cell	Empty Cell	After 6 months	Δ	After 6 months	Δ	After 6 months	Δ	between groups
RVSD (cm)	1.2±0.1	1.2±0.1	–	1.1±0.2	–0.1***	1.0±0.1	–0.2**	>0.2
RVSS (cm)	1.4±0.2	1.2±0.2	–0.2***	1.1±0.4	–0.3**	1.2±0.2	–0.2**	>0.2
LVPWD (cm)	1.1±0.1	1.0±0.2	–0.1*	1.0±0.3	–0.1*	0.9±0.2	–0.2*	>0.2
LVPWS (cm)	1.4±0.2	1.2±0.2	–0.2	1.1 0.2	–0.3	1.1 0.2	–0.3	>0.2
LVDd (cm)	5±0.4	5.2±0.2	+0.2	4.9 0.6	–0.1	4.9 0.6	–0.1	>0.2
LVDs (cm)	3.6±0.6	3.9±0.8	+0.3	3.6 0.8	–	3.5 0.6	–0.1	>0.2
LVM (g)	357.6±114.6	275.2±88.9	–79.9	239.4 68.6	–112.6***	238.6 78.9	–113.5**	>0.2
LVMI (g ⁻²)	199.6±66.9	158±53.6	–40.2	143.2 44.9	–54.4	133 46	–65.4**	>0.2

a

Mean values±S.D. are given. **P*<0.001, ***P*<0.01, ****P*<0.1 compared with baseline values.