

Letter to the Editor

Study of Left Ventricular Long Axis Function in Patients with Hypertensive Response to Exercise

To the Editor:

It was with great interest that we read the study of Dr. Takamura *et al.* (1), who recently published a study concerning hypertension. They examined left ventricular diastolic performance using echocardiography-Doppler as well as exercise tolerance in patients with a hypertensive response to exercise. They concluded that irrespective of the presence of resting hypertension, patients with hypertensive response to exercise had impaired left ventricular longitudinal diastolic function and exercise intolerance.

The long axis function of the left ventricle has been studied in the past *via* the M-mode recording of mitral atrioventricular plane displacement (MAPD) (2). More recently, the study of left ventricular long axis function has gained new interest with the development of new echocardiographic techniques, such as tissue Doppler imaging (TDI) (3), like in the study of Takamura *et al.* (1).

In our institution, we studied left ventricular long axis systolic and diastolic function in hypertensive patients (4), utilizing M-mode recording of the MAPD. We suggested that hypertensive patients without overt systolic dysfunction demonstrate left ventricular long axis systolic dysfunction, while long axis diastolic dysfunction always coexists with abnormal diastolic filling patterns. This suggests that long axis systolic dysfunction precedes diastolic dysfunction at the same axis in hypertensive patients. The same finding was reported by Nishikage *et al.* (5), who examined left ventricular long axis function amongst other echocardiographic parameters. These investigators found that the systolic long axis left ventricular function was impaired in 10% of asymptomatic hypertensive patients with preserved ejection fraction. This reduction was closely correlated with impaired diastolic function.

Takamura *et al.* (1) pointed out that there is impaired left ventricular long axis diastolic function and exercise intolerance in patients with hypertensive response, irrespective of the presence of resting hypertension. Moreover, they found impaired left ventricular long axis systolic function at rest. However, they did not discuss this finding in their publication. Probably, this finding could have affected their conclusions. It is well known, that the echocardiographic evaluation of left ventricular long axis contraction at rest can unmask a subnormal left ventricular functional status (6).

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Response to: Study of Left Ventricular Long Axis Function in Patients with Hypertensive Response to Exercise

To the Editor:

We appreciate the insightful comments of Dr. Kranidis and colleagues regarding our study (1). We agree with their previous study that hypertensive patients without overt systolic dysfunction demonstrate left ventricular (LV) long axis systolic dysfunction (2). Consistent with their reports, we showed that mitral annular peak systolic velocity (S') was impaired in patients with hypertension at rest. Interestingly, we found that S' was also impaired in patients with hypertensive response to exercise. As Kranidis *et al.* suggested, LV long axis systolic dysfunction may have affected our results. LV contraction and relaxation would be coupled in humans (3, 4). In fact, S' was linearly correlated with the mitral annular early diastolic velocity (E') in our study ($r=0.48$, $p<0.05$, data are not shown). However, exercise duration was correlated with E' to a greater extent than S' ($r=0.36$ vs. 0.19). It is widely accepted that LV diastolic function abnormalities contribute to exercise intolerance in patients with systolic dysfunction and patients with primary diastolic dysfunction (5, 6). At the current stage of knowledge, we believe that LV long axis diastolic dysfunction plays a central role in the pathophysiology of hypertensive response to exercise.

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