Abstract: 540

Left atrial dynamics during exercise in mitral regurgitation of primary and secondary origin: insights from exercise echocardiography combined with gas exchange analysis

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Topic(s):
Stress Echocardiography

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Background: The importance of left atrial (LA) dynamics in cardiovascular performance has been long recognized and is impressively receiving attention in modern times but a challenging and quite unexplored area of investigation appears the study of the effects of different types and severity of mitral regurgitation (MR) on LA dynamic during progressive exercise and the underlying pathophysiology.

Methods: 195 MR patients (80 primary and 115 secondary), and 54 control subjects underwent cardiopulmonary exercise testing evaluation combined with Echo-Doppler with assessment of LA dynamics and divided into 5 groups according to etiology and severity of MR during exercise using cutoff value of 3+.

Results: All MR groups had a lower LA-strain and strain rate at rest compared with Control (Control, n=54, 35 ± 8%, -2.9 ± 0.9 /s; Primary MR <3+, n=42, 26 ± 10%, -1.6 ± 0.7 /s; Primary MR =3+, n=39, 29 ± 12%, -1.7 ± 0.9 /s; Secondary MR <3+, n=75, 21 ± 11%, -1.7 ± 1.1 /s; and Secondary MR =3+, n=40, 13 ± 9%, -0.9 ± 0.9 /s, P <0.05 vs Control, figure). In Primary MR <3+, LA-strain and strain rate were improved during exercise, but not in Secondary MR. In Secondary MR, LA-strain and strain rate at rest and exercise and peak oxygen consumption (18 ± 6, 18 ± 7, 18 ± 6, 14 ± 4*, and 12 ± 3 ml/min/kg*) were decreased than other 3 groups (*P <0.05 vs other 3 groups, respectively). In Secondary MR =3+, ventilation versus carbon dioxide slope was higher compared with other 4 groups.

Conclusions: In MR patients of any origin, LA pump and reservoir function including their functional reserve have a key role in the abnormal response to exercise in the hemodynamic and ventilatory cardiopulmonary performance.
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