Paradigms and Paradoxes of left Ventricular Hypertrophy: from the Research Laboratory to the Clinical Consultation

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Abstract

Cardiac hypertrophy can occur as an adaptive response to increased cardiac work. Different forms of cardiac hypertrophy arise as a result of a combination of genetic, physiologic, and environmental factors. When hypertrophic growth of the heart leads to left ventricular dysfunction and heart failure, the response was considered as maladaptive or pathological hypertrophy.

After we analyzed left ventricular functional and structural changes in rats by arterial hypertension, banding of aortic root, isoproterenol administration or myocardial infarction and in patients with arterial hypertension, aortic stenosis or hypertrophic cardiomyopathy, we found a maladaptive response as pathological hypertrophy. However, the adaptation of the left ventricle found in response to physical activity or to pregnancy in humans seemed to help the heart adapt to increase in workload as physiological hypertrophy.

These considerations allow us to speculate for the use of future interventions to stimulate the development of physiological hypertrophy in several pathological situations or to change a pathological into a physiological response.

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