Cardiac structure and function in lowlanders at high altitude: short-term adaptation and chronic remodeling

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Abstract

Aims: The purpose of this study was to examine cardiac structure and function in lowlanders at high altitude(HA) to investigate short-term adaptation and long-term cardiac remodeling. Methods: In total of 301 healthy subjects included in this study, short-term exposed (STE) and acclimatized lowlanders (AL) at HA, native Tibetans(NT) and sea level residents(SLR) were comprised of 75,77,69 and 80 participants, respectively. Standard echocardiography was performed on all groups, subjects at HA were examined after return to sea level in <24 hours. Results: SBP and HR did not increase significantly after short-term exposure to HA in STE, but increased after long-term exposure in AL, which could be detected even after returning to the plain. Exposure to HA enlarged right heart, widened pulmonary artery and reduced left ventricular(LV) diastolic function in lowlanders. The degree of diastolic dysfunction was more obvious in AL. LV wall thickness increased even after short-term exposure to HA in lowlanders. Ejection fraction did not change significantly in STE, but decreased in AL. Conclusions: Exposure to HA could enlarged the right heart and decrease the diastolic function of LV in lowlanders. The LV systolic function was preserved after short-term HA exposure, but decreased after long-term HA exposure.

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