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Assess the effect of aging on cardiovascular structure and function by echocardiography in wild-type mice

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Aim: Aim of this study is to evaluate the cardiovascular structure and function in the young and old wild-type (WT) mice by echocardiography, in order to assess the effect of aging on cardiovascular function and structure.

Methods: Echocardiographic examination was performed in 45 normal adult WT mice that were divided into four groups according to age and gender (13 cases of 2-mo male, 13 cases of 2-mo female, 13 cases of 24-mo male and six cases of 24-mo female). We measured the cardiovascular structure and function parameters by 2D imaging echocardiography, Doppler and tissue Doppler imaging echocardiography, speckle tracking echocardiography (STE) and analyzed and compared the differences of cardiovascular structure and function in different age and gender groups.

Results: Body weights were increased and DP and MAP decreased in old mice when compared to young mice ($p < 0.05$). In the cardiac structural and functional parameters, EDV, ESV LV mass were increased and IVRT/DT, Max dp/dt and Tau were decreased with advancing age ($p < 0.05$). EF, IVCT, IVCT/ST, MPI, S-GLSR, S-GRS, S-GRSR and S-GCSR had no significant differences within same-gender groups ($p > 0.05$). Analyses by the Spearman rank correlation test showed the positive correlation between IVRT/DT and Max dp/dt (male $r = 0.662$; female $r = 0.639$). In the vascular structural and functional parameters, ascending aorta S and D diameter increased significantly with advancing age ($p < 0.05$). The male mice had progressive, age-related increased aortic stiffness.

Conclusion: The aging process leads to changes in cardiovascular structure and cardiac diastolic function, but systolic function is relatively well preserved. Cardiac diastolic function and arterial stiffness in the male mice may change earlier and more obvious than in female mice.

Recent Publications:

1. Wang J, Duan Y Y, Liu X, Hou W H, Gao G D, Zhao Z W and Qin H Z (2008) The relationship between intraoperative ultrasonography and pathological grade in cerebral glioma. *The Journal of International Medical Research* 36(6):1426-1434.
2. Wang J, Duan Y Y, Liu X, Gao G D, Qin H Z, Zhao Z W and Wang L (2011) Application of intraoperative ultrasonography in guiding micro-neurosurgical resection of small subcortical lesions. *Korean J Radiol.* 12(5):541-546.
3. Wang J, Duan Y Y, Shu Zhen Xu, Yong Zha, Ciugene F Bbu and Li Jun Yuan (2012) Effect of sonographically guided cerebral glioma surgery on survival time. *Journal of Ultrasound in Medicine* 31(5):757-762.
4. Wang J and Duan Y Y (2015) Comparative sonographic study of cerebral hemodynamic differences and changes after oxygen therapy in healthy youths of different ethnicities in Tibet. *Journal of Ultrasound in Medicine* 34(6):1107-1114.

Biography

Jia Wang completed her Doctor of Medicine at Fourth Military Medical University from 2006-2009. She was a Visiting Scholar at Cardiovascular Research Center-University of Pennsylvania from 2014-2015. She has been an Attending Doctor since 2009 in Department of Ultrasound Diagnostics at Tangdu Hospital, Fourth Military Medical University, China.