

Assessment of Cardiac Autonomic Function in Young Adults with a Positive Family History of Hypertension

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Having a positive family history of hypertension (+FHH) is a major risk factor for developing hypertension. However, the mechanisms contributing to this increased risk are not fully elucidated. The autonomic nervous system plays an integral role in the regulation of cardiovascular function, and autonomic dysregulation is known to contribute to the development of hypertension. Whether autonomic dysregulation is a precursor of hypertension in individuals with a family history of hypertension has not been clearly established. Therefore, we aimed to test the hypothesis that young, normotensive adults with a +FHH would exhibit impaired cardiac autonomic functions compared to normotensive, age-matched adults with a negative FHH (-FHH). Nineteen normotensive adults with +FHH (median age = 27 [interquartile range, IQR:26-28] years) and nineteen adults with -FHH (age = 27 [27-29] years) underwent the following standard cardiac autonomic tests: head-up tilt test (HUT), deep breathing test (DBT), Valsalva manoeuvre (VM), and 30% isometric handgrip test (HGT). Heart rate (ECG) intermittent blood pressure, and respiration (pneumobelt) were continuously recorded during all tests while grip force was also measured during the HGT. Standard autonomic function metrics for the above tests were calculated. The two groups were compared using an independent sample t-test (mean \pm SD) or Mann-Whitney-U test (median [IQR]). Resting heart rate, systolic blood pressure and diastolic blood pressure (DBP) were not different between the two groups ($p > 0.05$ for all). HUT-postural index ($p = 0.789$) was not different between the two groups. DBT-delta heart rate ($p = 0.337$) and Expiratory: Inspiratory ratio ($p = 0.618$) was also not different between groups. Similarly, the VM-Valsalva ratio ($p = 0.186$) and the HGT-maximum DBP difference ($p = 0.209$) were not different between +FHH and -FHH group. These findings indicate that cardiac autonomic functions do not appear to be affected in young, normotensive adults with +FHH. Whether cardiac autonomic functions would be altered in older individuals with a +FHH prior to development of hypertension needs to be investigated.

Keywords: Cardiac autonomic tests, parental hypertension, blood pressure regulation

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