

Hypertensive Response to Maximal Exercise Test in Young and Middle Age Hypertensive on Blood Pressure Lowering Medication: Monotherapy vs. Combination Therapy

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Abstract : Background: Hypertensive response during maximal exercise test provides important information on the level of blood pressure control and evaluation of treatment. Method: A single center retrospective descriptive study was conducted among 117 young (aged 20 to 40) and middle age (aged 40 to 65) hypertensive patients, who underwent treadmill stress test. Currently on maintenance frontline medication either monotherapy (Angiotensin-converting enzyme inhibitor/Angiotensin receptor blocker [ACEi/ARB], Calcium channel blocker [CCB], Diuretic - Hydrochlorthiazide [HCTZ]) or combination therapy (ARB+CCB, ARB+HCTZ), who attained a maximal exercise on treadmill stress test (TMST) with hypertensive response (systolic blood pressure: male ≥ 210 mm Hg, female ≥ 190 mm Hg, diastolic blood pressure ≥ 100 mmHg, or increase of ≥ 10 mm Hg at any time during the test), on Bruce and Modified Bruce protocol. Exaggerated blood pressure response during exercise (systolic [SBP] and diastolic [DBP]), peak exercise blood pressure (SBP and DBP), recovery period (SBP and DBP) and test for ischemia and their antihypertensive medication/s were investigated. Analysis of variance and chi-square test were used for statistical analysis. Results: Hypertensive responses on maximal exercise test were seen mostly among female population ($P < 0.000$) and middle age ($P < 0.000$) patients. Exaggerated diastolic blood pressure responses were significantly lower in patients who were taking CCB ($P < 0.004$). A longer recovery period that showed a delayed decline in SBP was observed in patients taking ARB+HCTZ ($P < 0.036$). There were no significant differences in the level of exaggerated systolic blood pressure response and during peak exercise (both systolic and diastolic) in patients using either monotherapy or combination antihypertensives. Conclusion: Calcium channel blockers provided lower exaggerated diastolic BP response during maximal exercise test in hypertensive middle age patients. Patients on combination therapy using ARB+HCTZ exhibited a longer recovery period of systolic blood pressure.

Keywords : antihypertensive, exercise test, hypertension, hypertensive response

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