

Blood Pressure Variability and Baroreceptor Sensitivity in Normotensive Obese in Response to Aerobic Exercise

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BACKGROUND: Autonomic dysfunction, with increased sympathetic activity at rest has been reported in obese individuals. Indices of blood pressure variability (BPV) and baroreceptor sensitivity (BRS) can provide insight into aspects of autonomic function, particularly following an aerobic exercise bout.

PURPOSE: To examine BPV and BRS in normotensive obese individuals in response to aerobic exercise.

METHODS: Normal-weight (n=8; 25 yr; 23.0 kg/m²) and obese individuals (n=9; 27 yrs; 32.2 kg/m²) performed a 60-min leg cycling exercise at 60% of VO_{2peak}. Beat-by-beat blood pressure was recorded at baseline, immediately post-exercise and 30 min into passive recovery using finger plethysmography. R-R intervals were obtained at 1,000 Hz with a digital acquisition system. Power spectral analysis was conducted using WinCPRS software for estimates of BPV (very low and low frequency (VLF, LF), and systolic and diastolic deviation (SDev, DDev)). BRS was estimated using the sequence technique. Natural log-transformed was performed on LF BPV (LnLF) to account for non-normal distribution.

RESULTS: HR increased from baseline similarly in both groups (p<0.05). The control group decreased SBP at immediately post-exercise compared to baseline measurements (p<0.05), but not the obese group. A main effect of time and group (p<0.05) existed for BRS. No group differences were found on DBP, LF, LnLF, VLF, SDev and DDev.

CONCLUSION: The results showed no difference in the BPV indices between the obese and control groups. The different response in SBP suggests that control group may have better BRS; however, this is not supported by the lower values in BRS. A limitation of this study may be the small number of participants.

	Control			Obese		
	Baseline	Immediate	30min	Baseline	Immediate	30min
HR (bpm)*	66 ± 11	88 ± 12	80 ± 12	60 ± 6	79 ± 11	74 ± 11
SBP (mmHg)*#&	116 ± 11	104 ± 8 ^{abc}	115 ± 9	122 ± 5	119 ± 6	122 ± 4
DBP (mmHg)	64 ± 10	64 ± 4	68 ± 7	69 ± 5	71 ± 5	72 ± 5
Raw LF (mmHg ²)	9.00 ± 5.37	15.91 ± 15.03	15.24 ± 12.29	5.23 ± 4.65	6.89 ± 4.93	9.64 ± 8.13
LnLF (mmHg ²)	2.07 ± 0.53	2.40 ± 0.89	2.41 ± 0.89	1.37 ± 0.75	1.73 ± 0.66	1.89 ± 0.98
VLF (mmHg ²)	20.83 ± 14.39	29.63 ± 19.77	22.69 ± 13.67	11.91 ± 7.96	18.68 ± 14.70	15.29 ± 10.87
BRS (ms/mmHg)*#	15.95 ± 7.92	5.20 ± 3.48	8.05 ± 4.52	19.38 ± 6.79	12.74 ± 8.70	14.49 ± 7.79
SDev (mmHg)	5.61 ± 1.75	7.14 ± 2.71	6.36 ± 2.25	4.77 ± 1.48	5.83 ± 2.42	5.50 ± 2.02
DDev (mmHg)	3.70 ± 1.08	4.06 ± 1.56	3.84 ± 1.31	3.67 ± 1.33	4.18 ± 1.67	3.90 ± 1.30

All data are mean ± SEM. *Time effect, # Group effect, & time x group effect, a Within-Subjects effect vs Baseline, b Within-Subjects effect vs 30min, c Between-Subject effect vs obese group.