

Sex-Specific Differences in Cardiovascular Parameters in Spinal Cord Injured Individuals

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Introduction: Females represent 20% of the spinal cord injury (SCI) population, yet sex-specific differences in cardiovascular parameters have not been examined. Given that SCI is associated with an increased risk of cardiovascular disease, establishing whether sex-specific differences in cardiovascular health exist is essential.

Objective: To examine sex-specific differences in cardiovascular parameters between females and males with a traumatic, chronic (>1 year), motor-complete (American Spinal Injury Association Impairment Scale A-B) SCI.

Methods: Eleven females (43 ± 7 years; C4-T5; 20 ± 8 years post-injury) and 11 age and lesion-level matched males (43 ± 7 years; C4-T5; 19 ± 9 years post-injury) participated in the study. Applanation tonometry was used to calculate aortic pulse wave velocity (aPWV) from arterial pressure waves collected at the carotid and femoral arterial sites. Discrete measurements of brachial artery systolic (SBP) and diastolic (DBP) blood pressure and heart rate (HR) were collected for 10 minutes during supine rest, and for 15 minutes following a passive sit-up test. The change (Δ) in SBP and DBP from supine to seated was calculated, and the incidence of orthostatic hypotension (ΔSBP ≥ -20 mmHg or ΔDBP ≥ -10 mmHg) was determined.

Results: Height (1.80 ± 0.06 vs. 1.69 ± 0.07, p=0.001) and mass (75.1 ± 13.6 vs. 60.8 ± 7.4, p=0.008) were higher in males compared to females, respectively. There were no between-group differences in aPWV, supine or seated hemodynamics, or ΔSBP and ΔDBP (see Table 1). In both females and males, the incidence of OH was 36%. When height and weight were included as covariates, there were still no between-group differences in aPWV.

Conclusion: Findings from this pilot study suggest there are no sex-specific differences in cardiovascular parameters between females and males with SCI. However, further investigations are warranted.

Table 1. Cardiovascular parameters

Variable	Females (n=11)	Males (n=11)	p value
aPWV (m/s)	7.5 ± 0.8	7.6 ± 1.1	0.688
Supine SBP (mmHg)	114 ± 13	116 ± 14	0.761
Supine DBP (mmHg)	67 ± 8	68 ± 10	0.804
Supine HR (bpm)	57 ± 7	60 ± 7	0.344
Seated SBP (mmHg)	110 ± 15	122 ± 20	0.131
Seated DBP (mmHg)	64 ± 8	69 ± 12	0.279
Seated HR (bpm)	63 ± 7	69 ± 13	0.223
ΔSBP (mmHg)	-14 ± 17	-6 ± 15	0.301
ΔDBP (mmHg)	-8 ± 9	-8 ± 12	0.921

Data are means ± SD.