

Exercise Pressor Reflex in Type 1 Diabetic Rats is Not Different Between Sexes

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ABSTRACT

Diabetes is a major risk factor for cardiovascular disease and is associated with complications such as autonomic and peripheral neuropathy. The pathophysiology and prevalence of cardiovascular disease differ between sexes. Diabetic patients have an exaggerated pressor and sympathetic response to exercise compared to healthy individuals, which may increase the risk of myocardial infarction and stroke during physical activity. **PURPOSE:** The purpose of this study was to determine whether the cardioaccelerator and pressor responses to static contraction and tendon stretch differ between sexes in type 1 diabetic (T1DM) rats. **METHODS:** We injected 50 mg/kg Streptozotocin (STZ) or the vehicle (CTL) i.p in fasted female and male Sprague Dawley rats and waited 10.5±2.5 days (female CTL: BW=274±5 g, glucose=195±12 mg/dL, HbA1C=4.4±0.07%; male CTL: BW=384±4 g, glucose=189±3 mg/dL, HbA1C=4.7±0.1%; female STZ: BW=259±9 g, glucose=485±20 mg/dL, HbA1C=7.3±0.4%; male STZ: BW=294±10 g, glucose=458±17 mg/dL, HbA1C=9.6±0.6%) before performing experiments. All experiments were performed on unanaesthetized, decerebrated rats. We either statically contracted the hind limb muscles or stretched the Achilles tendon for 30 s and measured changes in mean arterial pressure (MAP) and heart rate (HR). **RESULTS:** We found that the pressor (female CTL: Δ MAP=15±1 mmHg, n=8; male CTL: Δ MAP=16±1 mmHg, n=9; female STZ: Δ MAP=29±6 mmHg, n=8; male STZ: Δ MAP=25±3 mmHg, n=9, p=0.62) and cardioaccelerator (female CTL: Δ HR=17±2 bpm, n=8; male CTL: Δ HR=12±1 bpm, n=9; female STZ: Δ HR=13±5 bpm, n=8; male STZ: Δ HR=24±5 bpm, n=9, p=0.051) responses to static contraction were not significantly different between sexes in T1DM rats. Likewise, the pressor (female CTL: Δ MAP=21±6 mmHg, n=8; male CTL: Δ MAP=33±2 mmHg, n=9; female STZ: Δ MAP=37±8 mmHg, n=10; male STZ: Δ MAP=31±5 mmHg, n=12, p=0.11) and cardioaccelerator (female CTL: Δ HR=9±2 bpm, n=8; male CTL: Δ HR=12±1 bpm, n=9; female STZ: Δ HR=12±4 bpm, n=10; male STZ: Δ HR=14±3 bpm, n=12, p=0.33) responses to tendon stretch were not different between sexes in T1DM rats. The developed tensions from contraction or tendon stretch were similar within each comparison (p>0.05). **CONCLUSION:** We conclude that the pressor and cardioaccelerator responses to static contraction and tendon stretch are not different between female and male T1DM rats.