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Cardiovascular Responses to the Cold Pressor Test Are Not Modified in Healthy Adults with a History of Concussion

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Recent evidence indicates that physiological recovery from a concussion appears to take longer than clinical recovery. We have shown that symptomatic concussed patients have attenuated cardiovascular responses to the cold pressor test versus healthy controls. However, it is unclear if the attenuated cardiovascular responses to the cold pressor test persist in asymptomatic healthy adults who reported experiencing a concussion more than one year ago. **PURPOSE:** We tested the hypothesis that asymptomatic healthy active adults who experienced a concussion more than one year ago have a blunted cardiovascular response to the cold pressor test compared to healthy active adults without a history of concussion. **METHODS:** Thirteen healthy adults without a history of concussion within 1 year from the time of testing performed a 2 min cold pressor test. Subjects were retrospectively grouped into those who reported experiencing a concussion more than a year ago (n=5, CH) and those without a history of concussion (n=8, NH). After 10 min of supine rest, participants immersed their right hand into agitated ice water (~0°C) for 2 min. Heart rate (HR, 3-lead ECG), mean arterial pressure (MAP, finger photoplethysmography), systolic blood pressure (SBP), and diastolic blood pressure (DBP) were continuously recorded. Data were analyzed as the absolute change from baseline and are presented as mean \pm SD. **RESULTS:** At baseline, there were no differences between groups in HR (NH: 58 ± 14 ; CH: 65 ± 5 bpm, $P=0.35$), MAP (NH: 89 ± 9 ; CH: 88 ± 8 mmHg, $P=0.90$), SBP (NH: 121 ± 15 ; CH: 125 ± 13 mmHg, $P=0.67$), and DBP (NH: 69 ± 7 ; CH: 69 ± 6 mmHg, $P=0.93$). At the end of the cold pressor test, there were no differences in the increase in HR (NH: 16 ± 14 ; CH: 9 ± 9 bpm, $P=0.22$), MAP (NH: 20 ± 13 ; CH: 20 ± 12 mmHg, $P>0.99$), SBP (NH: 21 ± 16 ; CH: 21 ± 13 mmHg, $P>0.99$), and DBP (NH: 16 ± 9 ; CH: 16 ± 9 mmHg, $P>0.99$). **CONCLUSION:** These preliminary data indicate that cardiovascular responses to the cold pressor test return to normal in otherwise healthy adults who have experienced a concussion more than one year ago. More frequent assessments of the cardiovascular responses to the cold pressure test in concussed participants are warranted to determine the course of physiological recovery.

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