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Exercise Duration Augments Inter-Arm Systolic Blood Pressure Difference

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Blood pressure is a universal measurement used to aid in appropriate clinical decision-making and monitor safe exercise participation. An inter-arm systolic blood pressure difference (ISBPD; difference of ≥ 10 mmHg between arms) at rest is associated with vascular disease, arterial stiffness, and premature morbidity and mortality. The most commonly reported prevalence of ISBPD at rest is 10%. Recently, our laboratory observed a similar frequency of resting ISBPD and a greater occurrence when short-term (e.g. < 5 min) moderate-intensity aerobic exercise was used as a perturbation. Despite our observations, the incidence of ISBPD during exercise has yet to be clearly established in apparently healthy individuals. **PURPOSE:** To determine the exercise-induced response of ISBPD during a prolonged steady state bout of aerobic exercise. **METHODS:** Participants completed a VO_{2peak} test on a cycle ergometer. On a subsequent visit, participants cycled (60 rpm) at a workload equivalent to 50% of their VO_{2peak} for 30 min. Heart rate (HR) and systolic blood pressure difference (SBPD) was measured sequentially using standard auscultation in both arms at rest, 5, 10, 20, 30-min of exercise (EX-5, EX-10, EX-20, EX-30), and active recovery (AR). Descriptive and comparative statistics were generated. Further, logistic regression analysis was used to determine the change in the odds ratio (OR) of ISBPD given exposure to exercise. **RESULTS:** The prevalence of ISBPD at rest was 19%. Occurrence increased to 42% at EX-5 and EX-10, 56% at EX-20, 53% at EX-30, and 22% at AR. Males were more likely to present with ISBPD at EX-10 and EX-30 ($p < 0.05$). Interestingly, an additional 1 mmHg difference in SBPD at rest was associated with an increased OR at EX-10 and AR (1.34 and 1.23, respectively, $p < 0.05$). EX-5 resulted in a higher OR (1.14, $p < 0.05$) in participants that utilized a greater proportion of their peak HR reserve. **CONCLUSIONS:** The occurrence of ISBPD during moderate-intensity aerobic exercise increased with duration. Sex and submaximal HR response to prolonged exercise are closely related to exercise-induced ISBPD.