

## Lactate Concentration Response to Knee Extension Exercise with Various Initial Restrictive Pressures in Females

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### ABSTRACT

Literature remains lacking in regards to the role that initial restrictive pressure (IRP) coupled with resistance training as it pertains to the production and accumulation of metabolic byproducts such as lactate, more specifically in women. **Purpose:** The present study investigates the importance of the IRP as a variable on lactate concentrations during knee extension exercise in combination with blood flow restriction in female subjects. **Methods:** Thirteen female volunteers (age  $21 \pm 1.35$ ) served as the test sample for this study. Initial health screening, PAR-Q, signing of the informed consent, procedural and dynamometer setting familiarization were completed on the first meeting. Prior to exercise, the participants' maximal voluntary contraction (MVC) torque of right leg extensors was measured using an isokinetic dynamometer. Participants performed knee extension exercise with IRP set randomly at either 40-45 mmHg or 60-65 mmHg on two subsequent visits separated by a minimum of 48 hours. On each visit, participants performed 4 sets (1×30 reps and 3×15 reps) of dynamic knee extension exercises with the load set at 20% of their respective MVC. The load lifted for both visits was same and determined using pre-MVC values from the first visit. A lactate analyzer was employed to measure lactate concentration within blood sample from finger pricks. Participants washed their hands before testing started and isopropyl alcohol wipes were used to clean the puncture site before the collection of blood. Levels of lactate concentration were measured prior to exercise, between the second and third sets, and at immediately post exercise. **Results:** A significant main effects for time ( $p < 0.01$ ) was detected, but there was no significant difference in lactate concentrations ( $p > 0.05$ ) between the conditions (40-45 mmHg vs. 60-65 mmHg) over the course of dynamic knee extension exercise. **Conclusion:** Given that females may store more adipose tissue accumulated around their hip and thighs, magnitude of the effect of IRPs may vary within and across genders, resulting in changes in the type of muscle fibers (type I vs. type IIx) recruited, the total number of muscle fibers recruited, and the level of fatigue. More research is required to determine the impact of various IRPs on the level of byproducts production and accumulation.

