Abstract:

Objective: Lactate is frequently utilised in clinical practice. Some have concerns that tourniquet application for venous blood collection may falsely elevate venous lactate. The objective of the present study was to determine the effect of tourniquet time on varying venous lactate concentrations.

Methods: This is a healthy volunteer study, in which subjects were their own controls. A cannula was inserted into each arm, with a tourniquet remaining on one. Subjects were allocated to one of three groups; rest (no activity), exercise (maximal exertion to elevate lactate concentrations) with immediate tourniquet application or exercise with delayed (5-min post-exercise) tourniquet application. In all blood was drawn simultaneously from both cannulas at 0, 2.5, 5, 10 and 15-min post-tourniquet application and analysed for lactate on a point-of-care device. The primary outcome was a clinically significant difference (>1 mmol/L) in tourniquet versus non-tourniquet arm lactate concentration.

Results: There were 10 subjects per group; the exercise groups achieved a mean maximum lactate concentration of 10.4 mmol/L (standard deviation 3.6) (exercise with immediate tourniquet application group) and 8.9 mmol/L (SD 2.5) (exercise with delayed tourniquet application group). There was no clinically significant increase in lactate concentration in the tourniquet compared to non-tourniquet arm in all groups, across all tourniquet application times, and over a range of lactate concentrations. In the rest group after 15-min of tourniquet application the mean lactate concentration of the tourniquet versus non-tourniquet arm was 0.91 mmol/L (SD 0.55) versus 0.89 mmol/L (SD 0.46) (P = 0.99), respectively.

Conclusion: In the present study tourniquet application for blood collection did not significantly increase lactate concentration. Hence, clinically a raised venous lactate concentration should not be attributed to prolonged tourniquet application.

Reference: