



THE EFFECT OF HIGH INTENSITY CYCLING ON TEMPERATURE MEASURED BY THERMAL IMAGING OF THE VASTUS LATERALIS



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INTRODUCTION

Thermal heat produced by muscles after exercise can change under certain conditions, although this is not universally observed across all exercise types. In some cases, increased blood flow or muscle "pump" is more evident than temperature changes. Thermal imaging cameras, which use infrared technology to measure heat, have become more commonly used and are trusted for assessing heat emission.

PURPOSE

Does an acute bout of high intensity cycling affect regional temperature as measured by thermal imaging?

METHODS

Thirty-two recreationally trained college students (age 19.79 ± 1.0 years, height 165.4 ± 12.1 cm, weight 69.7 ± 13.3 kg) volunteered for this study. Participants visited the lab on two days. The first day was a familiarization in which peak power output was measured on ergometer bike. On a separate day they performed 5 sets of 2 min bouts of biking at 70% max power. Prior to and following cycling three thermal images of the vastus lateralis were taken using a 259x192 high resolution thermal camera. The vastus lateralis was isolated by a thermal cloth that was placed over the leg that only had the vastus lateralis exposed so that only the muscle area could be seen. Mean temperatures of the three images were used and a paired t-test was used to compare pre and post cycling values.

RESULTS

There was no significant ($p=0.1$) difference in the thermal imaging temperature of the vastus lateralis area (skin and underlying tissue). Pre-mean temperature was 28.9 ± 1.5 ° C compared to 28.3 ± 2.9 ° C post.

CONCLUSION

There was no change in thermal temperature of the Vastus Lateralis area following 10 minutes of high intensity cycling. As one would expect muscle and surrounding tissue to increase temperature following a high intensity bout, we did not observe this. Exercise commonly has a thermogenic effect as there is an increase in blood flow to meet metabolic demand. This leads to a rise in skin temperature as a result of the increase in metabolic activity and vasodilation. The current exercise condition might not have been long enough in duration to elicit these affects. It also could be that there was a specific region of interest (Vastus Lateralis) and the change in temperature might not have been observed do to venous return of the blood and/or dissipation of heat in a more holistic manner

PRACTICAL APPLICATION

10 minutes of high intensity cycling is not enough to elicit changes in leg/muscular temperature. Changes in muscle temperature may not be able to be measured using thermal imaging techniques.

Comparison of Pre and Post temperatures after cycling

