

HEAT PACK TRIAL

No influence of physiotherapeutic heat pads on muscle glycogen score as assessed by high-frequency diagnostic ultrasound and cloud-based software

Purpose

The purpose of this study is to determine if application of physiotherapeutic heat pads will influence the glycogen score as assessed by diagnostic ultrasound and cloud-based software.

Methods

4 subjects applied physiotherapeutic heat pads to their right anterior thigh for 15 minutes, assessing glycogen in the rectus femoris using high-frequency diagnostic ultrasound and cloud-based software immediately before and after the application of the heat pads. For each time point, three ultrasound scans were obtained. Scans were also obtained at the aforementioned time points on the left rectus femoris to serve as a control. In order to eliminate the potential influence of recent meals and/or caffeine on glycogen metabolism, subjects were tested in the morning following an overnight fast and refrained from eating or consuming caffeine (coffee, tea, etc.) the morning of the test.

Results

No subject showed a significant change in their rectus femoris glycogen score from pre-hot pack to post-hot pack on either the right or left side. The greatest change that was observed due to the heat pack was a 2 point decrease. The other 3 subjects had a change of 1 point (2 subjects had an increase, 1 had a decrease). The greatest change that was observed on the control side was 2 points. 1 subject had a score increase of 2 while the other subject who had a 2 point differential had a decrease of 2 points. 1 subject had a 1 point increase. The 4th subject had no change. Importantly, these score changes can be interpreted as “no change” because the accuracy of glycogen scores as assessed by high-frequency diagnostic ultrasound is approximately +/- 1 point.

Conclusions

The application of physiotherapeutic heat pads does not change the glycogen score in muscles as assessed with high-frequency diagnostic ultrasound. Thus, a warm muscle will not cause a false elevation or false depression in muscle glycogen content as assessed with high-frequency diagnostic ultrasound. Additionally, subjects who may have their glycogen content assessed in both a non-warmed-up, resting state and during or after exercise when their body temperature is elevated can be confident that varying muscle temperatures at the time of testing were not the cause of score differentials.