THE EFFECT OF WEARING COMPRESSION GARMENTS ON RESPONSES TO SUBMAXIMAL EXERCISE

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Review of Literature

The relationship of the study on muscle fatigue was used to establish the influence of Compression Garments (CG) during high intensity exercise. CGs have shown to result in a more rapid intense muscle fatigue due to the increase in intramuscular pressure and resulting ischemia (Maton et al., 2006). Conversely, wearing CGs indicates a shortened amount of time required to recover after muscle performance, because of increased enhancement of blood circulation. To illustrate, the increase in blood circulation is due to a reduction of cross sections through veins, in which blood flow is improved (Surenkok et al., 1999). Furthermore, another aspect of CGs is the contribution of their function as stiff fascia, to improve blood supply during muscle performance (Montgomery et al., 2008). Another aspect of CGs is that they tend to assist in the reduction of muscle oscillation and vibration during an exercise bout (Duffield et al., 2010). Also, CGs have been used as a temperature mediator to help maintain body temperature during warm up and exercise (Maton et al., 2006).

Purpose

The aim of this study was to determine whether or not wearing compression garments has an effect on heart rate, blood pressure, blood lactate levels, and rate of perceived exertion (RPE) during submaximal exercise.

Methods

Each subject reported to the Exercise Science Research Laboratory (MAC 150) on 2 separate sessions; one session with loose sport shorts that they provided, and for the other session they wore compression shorts (Underarmour) that were provided to them. The seat height was adjusted so that there was a slight bend in the knee when the leg was fully extended on the pedal. The measurements for skinfolds were taken at three sites and included triceps, subscapular, and chest. A Polar heart rate monitor was placed around their chest and the wrist watch was attached to the handle bar so that the heart rate could be read every minute. A resting blood lactate was obtained. The subject's finger was cleaned with alcohol and then pricked with a blood lancet to obtain a drop of blood. A capillary tube was attached to a reflation applicator to collect the sample of blood from the subject. The blood sample was placed on a strip of paper inside the Analyzer and the lactate level of that blood was found using the Accusport Lactate Analyzer. The subject were given a piece of gauze and/or a bandaid.

Methods (cont'd)

A resting HR/BP value was recorded and then the subject began pedaling. During the first 5 min the workload on the bicycle ergometer was adjusted to a level that raised their HR to 85% of their age-predicted HRmax. The subject then continued to ride for 15 min. The RPE was recorded every 3 minutes. At the conclusion of the 15 min ride, final HR and BP values were obtained. Then after 5 min of recovery another blood lactate level was determined as stated above. Subjects were tested in a randomized manner with and without compression shorts to account for order effect.

Without

With

Results

Subjects' demographic information [age, weight (kg), height (cm), %BF] resulted in averages of 27 ± 5.43 yrs, 75.02 ± 11.19 kg, 179.32 ± 9.61 cm, and 16.44 ± 9.07 %BF, respectively. There was no significant difference between the variables measured during submaximal exercise without and with compression shorts as indicated by heart rate, blood pressure (SBP/DBP), BLa, and RPE. The mean values of the variables measured with and without compression shorts and their corresponding *p* values are as follows: HR (with) = 122 ± 7.40 bpm; without = 130 ± 7.82 bpm (p=0.36), SBP (with) = 140 ± 7.25 mmHg; without = 136 ± 5.76 mmHg (p=0.07), DBP (with) = 68 ± 7.16 mmHg; without = 66 ± 4.09 mmHg (p=0.63), BLa (with) = 3.94 ± 0.39 mmol/L; without = 4.00 ± 0.20 mmol/L (p=0.67); RPE (with) = 12 ± 2.00; without = 11 ± 1.67 (p=.21).

Results (cont'd)

Table 1: Variables

Variables	Mean	SD
HR-With (bpm)	122	± 7.40
HR-W/out (bpm)	130	± 7.82
SBP-With (mmHg)	140	± 7.25
SBP-W/out (mmHg)	136	± 5.76
DBP-With (mmHg)	68	± 7.16
DBP-W/out (mmHg)	66	± 4.09
BLa-With (mmol/L)	3.94	± 0.39
BLa-W/out (mmol/L)	4.00	± 0.20
RPE-With	12	± 2.00
RPE-W/out	11	± 1.67

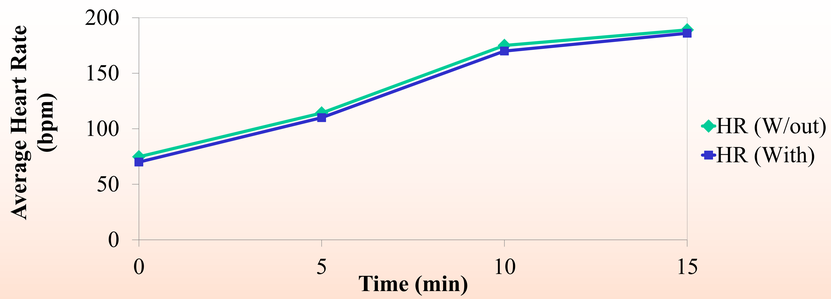

Figure 1: Relationship Between Time And Average Heart Rates (bpm) During Submax Bike Test

Conclusions

The *t*-test analyses revealed that there were no significant differences ($p \geq .05$) between the two treatments (without/with compression shorts). These results indicate that the use of compression garments did not significantly change physiological responses during submaximal exercise. Possible suggestions would be that athletes use compression garments for their intended purpose of maintaining warmth in the lower extremities.