Does wearing a chest strap heart rate monitor affect an individual’s physical working capacity?

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Introduction

The current study focused on whether wearing a chest strap heart rate monitor affects an individual’s physical working capacity (PWC) the maximum amount of work an individual can do during physical activity. A submaximal test was designed to determine if there is an effect of the chest strap on heart rate and breathing patterns, providing an alternative to maximal testing procedures, such as the VO_{2max} test. Previous work has used the VO_{2max} test to identify the maximal physical working capacity for an individual. The VO_{2max} PWC170 test is a submaximal test that was maximized for this study using a chest strap heart rate monitor. The VO_{2max} test was not the ideal test to use as the chest area was around the heart, thus the chest strap was designed to fit snugly around the chest to minimize any disturbance to the respiratory system. This study investigated whether wearing a chest strain heart rate monitor has an effect on an individual’s physical working capacity, as chest strain may not be able to adequately monitor the strain on the oxygen uptake of an individual’s cardiovascular system.

Methodology

Twelve active, but non-elite, male university students were recruited for this study. Each Ethics significant. Results indicated a significant amount of tension for every participant, based on pre-test and force measurements by Samson (2011). One participant was unable to complete the test, and a second participant was unable to elicit a heart rate within the required range of 120-170 beats per minute, so both sets of data for these participants were disregarded.

Results

Results indicated that the physical working capacity of the individual when they were not wearing the chest strap heart rate monitor was significantly higher (mean difference = 44.6, SD = 61.6) than when they were wearing the chest strap. A significant difference was found, the effect size was calculated to determine if the difference was practically significant. However, the effect was still real and thus worth looking into.

Discussion

The purpose of this study was to determine if wearing a chest strap heart rate monitor would affect an individual’s physical working capacity at a heart rate of 170 beats per minute during submaximal exercise. It was hypothesized that wearing the chest strap would result in a lowering of the effective heart rate. The results of the current study support the hypothesis, as it was determined that wearing the chest strap reduced the effective heart rate by 8.5% of the individual’s chest circumference resulted in a significantly lowered VO_{2max}.

This study is experimental and provides evidence that wearing a chest strap could affect an individual’s physical working capacity. Future research needs to be performed in a controlled environment to determine the effect of wearing a chest strap on respiratory and cardiovascular function.