**Abstract**

The circadian rhythm, also known as sleep/wake cycle, is a cycle that is constantly running as long as you are alive. The circadian rhythm is on a 24-hour clock that cycles between drowsiness and alertness at regular intervals. The circadian rhythm will affect physiological variables such as heart rate, oxygen consumption and blood pressure which has a large impact on exercise performance. The Bruce Protocol is a treadmill test used to measure maximal oxygen consumption ($VO_2\text{max}$).

The purpose of this study was to evaluate the $VO_2\text{max}$, Rate of Perceived Exertion (RPE), Time of exercise (min: sec), and Maximal Heart Rate measured at different times of the day.

**Purpose**

The purpose of this study was to evaluate the $VO_2\text{max}$, Rate of Perceived Exertion (RPE), Time of exercise (min: sec), and Maximal Heart Rate measured at different times of the day.

**Methods**

Five men (age 21 ± 0.8 yrs) from the University of Texas at Arlington (UTA) student population, volunteered to participate in this study. Each of the participants was required to complete the Bruce protocol. Which increases the speed and elevation progressively until the subject can no longer continue to exercise. The participants had to complete the study twice, once in the morning before 10 AM and once after 3 PM. During each test, maximum oxygen consumption ($VO_2\text{max}$), heart rate, rate of perceived exertion (RPE), and maximal heart rate ($HR_{\text{max}}$), were measured. The alpha level for significance was set at $p \leq 0.05$.

**Protocol/Experiment Design**

The subjects performed two maximal exercise tests using the Bruce protocol on the treadmill. During the test the incline and speed increased every three minutes. During their initial visit to the participants were allowed to exit the treadmill. The participants were then scheduled for the second test.

Instrumentation

The following equipment was used for the study: Headgear, which is responsible for keeping the mouthpiece stable. A Polar heart monitor to measure the subjects’ heart rate. Noisecip was used to keep the subject breathing through their mouth. The Parvo Medics TrueOne 2400 metabolic cart was used to measure the oxygen consumption. Lastly, the treadmill was used to allow the participant to perform the maximal exercise test.

**Results**

The results of this study indicated that the time of day (before 10 am or after 3 pm) did not make a significant difference on any of the variables measured during maximal exercise performance. The findings here didn’t match the findings from the literature reviewed which showed that exercise performance in the morning was more efficient than the afternoon.

**Conclusions**

The results of this study indicated that the time of day did not make a significant difference on any of the variables measured during maximal exercise performance. The findings here didn’t match the findings from the literature reviewed which showed that exercise performance in the morning was more efficient than the afternoon.