The Impact of Rest Periods on Repeated Sprint Performance

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Introduction

It is not uncommon for coaches to have athletes run multiple sprints with short rest periods as a form of conditioning (Bishop 2011, Nakamura 2015). Many coaches do not know how the rest period impacts sprint performance. Therefore, the purpose of this study was to determine the impact of rest periods on repeated sprint performance.

Methods

Thirteen Division III athletes competing in various sports participated in a repeated sprint test on two separate days. Each testing day consisted of a standardized warm-up followed by five 40-meter sprints. Each participant was randomly assigned one of the two testing conditions. The athletes were instructed to maximally sprint from one electronic timing gate to the end gate, which was placed 40-meters away. They repeated this five times with a 30-second rest between each on one day, and a 3-minute rest between each on the other day. The times for each sprint were recorded for analysis. Testing days were separated by 24 hours to ensure that the athletes were recovered from the previous testing session. The electronic timing system that was used was a Brower Timing System. All the athletes were tested on the indoor track at Carthage College. In order to determine if any differences existed between the five sprints, a repeated measures analysis of variance (ANOVA) was used. In addition, Cohen’s d was calculated to determine the magnitude of change in sprint time and was categorized as: trivial < 0.2, small 0.2–0.6, moderate 0.6–1.2, large 1.2–2, and very large 2.0–4.0 (Hopkins, 2002).

Results

Stepwise increasing means from the 30-second rest period condition are shown in figure 1, while fairly constant means from the 3-minute rest period condition are shown in figure 2. Results from the repeated measures ANOVA showed that there was not a significant difference between the sprint conditions (p = 0.480), between individual sprints with 30-second rest periods (p = 0.293), and between individual sprints with 3-minute rest periods (p = 0.812). The magnitude of change from sprint one to sprint five was approaching moderate (d = 0.558) for the 30-second rest condition, however this same statistic was trivial (d = 0.046) for the 3-minute rest condition.

Discussion

One important finding was that no statistically significant change in sprint time occurred. In contrast, there was a “small” increase in sprint time with the 30-second sprint time condition. This indicates that sprint performance did begin to decline with the shorter rest period. Although this finding was not statistically significant, there may be a practical significance to these data. Figure 1 shows that with the short rest period sprint times steadily increased. If the athlete were to run 10 sprints in a row, instead of five, it is likely that acute fatigue would lead to a statistically significant increase in sprint time. The underlying physiological mechanisms behind this fatigue are unknown, but indirect evidence would suggest by-products like inorganic phosphate and hydrogen ions accumulate to a greater extent in under-rested muscles that are completing high-intensity recurrent activities (Gaitano 1993). In addition to by-product accumulation, short rest periods allow less time for phosphocreatine resynthesis between repetitions, which has been shown to decrease sprint performance (Bishop 2011). Future research should use more sprints and/or longer sprints to determine the optimal rest period for repeat sprint performance.

References