

Abstract

Title: Time characteristics of the load when climbing the same path on an artificial wall and on a climbing ergometer

Objectives: The aim of this work was to assess the time characteristics of the grip when climbing on a climbing wall and on climbing ergometer and to compare these results.

Methods: Twenty female participants were divided according to their performance into two groups. Two identical routes were climbed- one on a climbing ergometer, the other on an artificial climbing wall. Climbing routes were 18 m long and were rated Grade 7 on the IRCRA scale. There were 45 grips used in total, the starting hand grip was 1.5 m above the ground. The profile of the climbed route was perpendicular (90 °). The task was to climb the route in the specified time. Data were collected by making a video recording of the movement on the climbing wall and the climbing ergometer. To determine the time characteristics, video recordings were analyzed in Dartfish 10 software and the duration of the static and dynamic phases were assessed.

Results: The total time of climbing on the ergometer was 258.0 ± 16.1 s for less advanced, 263.8 ± 4.4 s for more advanced. The total time for wall climbing was 273.4 ± 22.9 s in the less advanced group and 259.5 ± 18.4 s in the more advanced group. The mean time of static phases was 193.0 ± 24.4 s when climbing on an ergometer and 206.7 ± 27.0 s when climbing on a wall in the group of less advanced and 176.6 ± 41.1 s when climbing on an ergometer and $184, 7 \pm 22.2$ s when climbing a wall in a group of more advanced. Holding the grip lasted 5.2 ± 0.3 s on the ergometer and on the wall 5.6 ± 1 s in the less advanced group, in the more advanced group 5.0 ± 0.2 s on the ergometer and on the wall $5.0 \pm 0, 4$ s. The time of the dynamic phase for climbing on the ergometer was 65.0 ± 21.5 s and $66.7 \pm$

18.4 s when climbing on the wall in the group of less advanced and 87.1 ± 41.0 s on the ergometer and on the wall $74, 8 \pm 29.9$ s on the wall in the more advanced group. Rest time in the group of less advanced was 6.1 ± 7.3 s on the ergometer and 5.0 ± 5.7 s on the wall, in the group of more advanced 7.0 ± 9.6 s on the ergometer and 3.7 ± 4.0 s on the wall. The overall ratio of static and dynamic phase in the less advanced group was 3.4: 1 when climbing on an ergometer and also when climbing on a wall. The overall ratio of static and dynamic phases in the more advanced group was 2.6: 1 when climbing on an ergometer and 2.9: 1 when performing on a wall.

Conclusions: The results indicate the fact that the time characteristics of the load when climbing on a climbing ergometer are not the same as when climbing on an artificial wall. However, the time characteristics are not so different and therefore the climbing ergometer does appear to be a promising training tool for the future.

Keywords: sport climbing, loading, static phase, dynamic phase, climbing treadwall