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Table of Content

Sport Coaching

COMPARISON PLYOMETRIC ROPE JUMPING WITH DIFFERENT WORK INTERVAL 10, 20, 30 SECOND TOWARD AGILITY

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Abstract

Introduction: Plyometric rope jumping is an easy and cheap training, and it can be done anywhere, also have an effect of physical performance. The goal of this research is to compare the effectiveness of plyometric rope jumping training with 10, 20 and 30 second – work interval toward speed and agility. **Method:** The total of subjects in this research was 33 students (trained) which would be divided into 3 groups of 10 second – work interval (n=11), 20 second – work interval (n=11), and 30 second – work interval (n=11). The measurement of agility's time was by using AFL test. This research used consecutive sampling method with pre-test – post-test control group design. **Results:** Research has shown mean of age 19,30±0,91 years old, body mass index 22,05±2,46 kg/cm^2, leg 85,09±4,98 cm. There were significant differences (p>0,05) in agility with 10 second – work interval group (0,001) while there were no significant different in work interval 20 and 30 seconds. In the ANOVA test there were significant differences in agility (0,000). **Conclusion:** Plyometric rope jumping increase agility with work interval 10 second while work interval 20 and 30 second can not increase agility.

Keywords: Plyometric rope jumping, agility

INTRODUCTION

The training of plyometric can increase performance. Plyometric training, a well-established tool used to improve sports performance and prevent injury, has recently been adapted for lower extremity rehabilitation (Chmielewski et al. 2006). The plyometric training increase speed, strength and power (Chu & Myer, 2013). Plyometric refers to those activities that enable a muscle to reach maximal force in the shorten possible time (Haff &Tripplet, 2016). The rope jumping is one of plyometric trainings that is easy to do. The plyometric training can improve neuromuscular function. Plyometric exercise is a quick, powerful movement using a prestretch, or countermovement, that involve the stretch shortening cycle (SSC). Rope jumping exercise can increase agility and reaction time (Hariyanto, 2010). Using a rope and measuring tape, this rope jumping training can be done whether it is individual or collective. A key factor for agility task in particular is the use of visual input when executing and coordinator movement (Gamble, 2012). The training of plyometric uses ATP-PC and as energy system.

This research aimed to know the comparison of plyometric rope jumping training using 10, 20 and 30 second – work interval increase of agility.

METHOD

The type of research that was used was experimental field using a research plan of pre test and post test control group design in three groups. The samples of this research were sport science students in FIK UNESA mayor sport science two semester which were chosen

through consecutive sampling. The number of samples was 33 students in total where were divided into three groups randomly. The first group used a training using 10 second – work interval, the second group used a training using 20 second – work interval, and the third group used a training using 30 second – work interval. The plyometric rope jumping training was done by jumping a rope as high as 40 cm medial and lateral. This research was done as long as six weeks and measuring an agility used AFL test.

RESULTS AND DISCUSSION

There were many data which were gained from this research then they were analysed and matched with research's aim. The results of research which were gained : the mean of ages of all groups 19,30±0,9 years old, BMI 22,59±6,7 kg/cm^2, leg 85,09±4,9 cm. The age data, BMI(body mass index) and leg were homogenity due to $p>0,05$. The mean and standard deviation of plyometric rope jumping were 4,82±0,3 seconds. On the other hand, the value of homogeneity test using Bartlett test produced homogeneous data due to $p>0.05$. The results of homogeneity test on agility before the training of plyometric rope jumping were 0,09. On the mean of pre – test and post – test on agility, the first group using 10 second – work interval experienced a increase from 4,93±0,44 seconds to 4,66±0,22 seconds, the second group using 20 second – work interval experienced a increase from 4,73±0,14 seconds to 4,70±0,13 seconds, and the third group using 30 second – work interval experienced a decrease from 4,80±0,24 seconds to 4,85±0,25 seconds. However, the agility variable revealed where the first group using 10 second – work interval showed a siginificant different (p=0,001), the second group using 20 second – work interval showed there are no significant different (p=0,569), the third group using 30 second – work interval showed there are no significant different (p=0,508). The anova test results of plyometric rope jumping training groups using 10, 20 and 30 second – work interval on agility indicated that siginificant different (0,000). The increasing of work interval 10 second because maximum recruitment muscle fiber and then the stretch reflex shape from neural adaptation in six weeks. While work interval 20 second and 30 second can not increase because fatigue and stretch reflex is impossible.

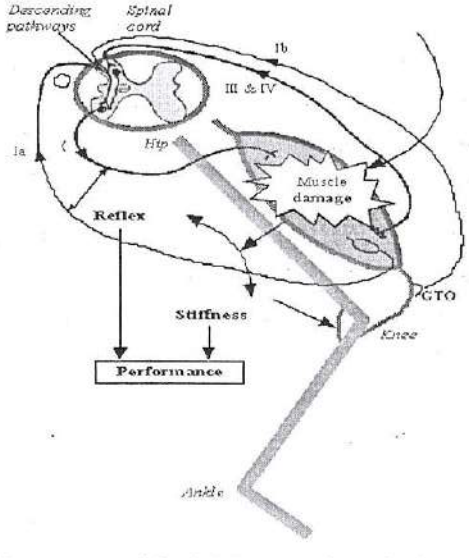

Figure 1 Propose with SSC exercise, induced muscle damaged and performance reduction (Zatsiorsky, 2000).

Figure 1 summarizes our current view of the possible interactions between muscle damage, reduced stretch-reflex sensitivity, reduce stiffness regulation and deterioritation in SSC performance (Zatsiorsky, 2000). As regards the latter process, our current data rule out the possibility of any significant influence of reduced fusimotot support to the musle (Zatsiorsky, 2000).The work interval 20 second and 30 second reduce performance because fatigue. Instead, however they strongly suggest that the muscle spindle could be directly or indirectly inflyenced by exgaustive SSC fatigue.(Avelaet al. 2000).

Conclusion and Suggestion: The first group using 10 second – work interval can increase an agility. The second group with work interval 20 second and the third group with work interval 30 second can not increase agility. Results obtained here my help in develop guide to fixed carefull work interval to enhance performance in sport with agility like rugby, football and martial art.

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