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Study on Improving Lower Limb Strength among Junior Soccer Players Aged 14

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Abstract

The aim of this study is to improve leg strength through specific exercises among junior soccer players using exercise ball athletics. We would like to see if the leg strength of junior 14-year old players can be improved significantly within 8 weeks. We want to see the extent to which exercise ball training can be effective in improving explosive strength by measuring physical indicators for players of this age. The study was conducted on two groups of junior players aged 14: for the experimental group, the weight range was 54.38±11.66 and the height range was 170,16+10,94; for the control group, weight was 54.77+11.17 kg and height was 169.22+8.30 cm. This research included 36 players and the experiment was conducted during July-August 2012. During the experiment the players performed 4 weekly workouts that included in two of the training sessions specific exercises combined with exercise ball athletics to develop leg strength. In order to observe the evolution of subjects during our research we conducted a series of tests on the following parameters: Squat Jump - hands on pool and hands free; Counter Movement Jump - hands on and hands-free pool; Standing Long Jump.

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Keywords: explosive strength, junior, legs, the physical parameters, soccer

1. Introduction

Fleck and Kraemer (1993), claim that strength exercises with bodyweight resistance is a favorable starting point for most children under 8 years old, or any child who begins a strength training program. For Zaţiorschi (1968), explosive strength is based on "time for the force to increase to half its maximum value". Bosco (1995) states that explosive strength is the ability of the muscles to develop high degrees of force in a short time. Harre (1973) considers that force-velocity is characterized by "the capacity of the entire neuromuscular system to overcome resistance with the highest possible speed." Weineck (1992) believes that to achieve a precise

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movement minimum force and minimum speed are necessary. The main condition for sports performance is strength training (Bompa, 2002). Insufficient power delays appropriate execution accelerates fatigue and affects precision of gestures. Evidence suggests that power increases in accordance with the development of the nervous system, which is paramount in the exercise and developing of muscle strength (Ekbolm, 1989). The reactive-ballistic aspect of explosive strength is important in soccer because all technical movements and dynamic actions of the players depend on this ability that allows them to shoot the ball at a speed of over 100 km/h, although this speed is influenced primarily by the ability of a technical player (Luhtanen, 1989). In strength training very low resistance points (weight) should be used to allow fast contraction. Workforce development activity must be established for at least 8 weeks, at least 3 times a week during at least 15-20 minutes/workout, proposing extended periods of recovery between workouts (Ferrante, 2000). Studies on improving the players' leg strength with explosive type exercises during 8 weeks were also conducted by other researchers.

1.1. Hypothesis

We assume that if we apply specific training programs to improve leg strength through specific exercises combined with exercise ball athletics, we are able to improve the explosive strength in soccer players aged 14.

1.1. Material and Methods

1.2.1. Subjects

This research included 36 players who were divided into two experimental groups (age 14, weight 54.38+11.66 kg, height 170.16+10.94 cm) and controls (age 14 years, weight 54.77+11.17 kg, height 169.22+8.30 cm) and the experiment was conducted during June-August 2012. There were no reported health problems and the gear used was identical in both tests. During the experiment 4 weekly workouts were performed, two of them including specific exercises to develop leg strength with exercises in athletics, jumping, combined with an exercise ball. Children were informed about the study and agreed to conduct these training exercises for developing explosive strength.

1.2.2. Procedures

Training sessions were held outdoors on the soccer field and running track. In order to be able to monitor the development of the explosive strength of the subjects' lower limbs we performed an initial and a final testing, the children involved using similar sports gears in both trials (shirt, shorts and shoes). The investigated subjects worked out 4 times a week, and in two training sessions, on Tuesdays and Thursdays, they practiced explosive type exercises (Table 1). Subjects started each exercise session with specific warm-ups.

1.2.3. Testing

The parameters tested were: Squat Jump (SJ), Counter Movement Jump (CMJ) and Standing Long Jump (SLJ).

Squat Jump and Counter Movement Jump test subjects had to execute first hands on swimming in the second test handsfree sides. Each subject test was run twice and the best result was retained. Similar tests were conducted by Michailidis et al. (2013) over a period of 12 weeks. The effect of explosive type exercises was also introduced in training by Meylan and Malatesta (2009), who tested during 8 weeks the influence of plyometric exercises on practicing soccer. Our study aimed to improve leg strength through explosive type exercises.