

EFFECTS OF MUSCULAR STRENGTH TRAINING IN HANDBALL PLAYER

Heli Zhang and Haifan Zhang¹

Sichuan Research Institute of Sports Science, Chengdu, SiChuan

People's Republic of China

¹Chengdu Physical Education Institute, Chengdu, SiChuan, People's Republic of China

KEY WORDS: handball, explosive force, isokinetic dynamometer

INTRODUCTION: Isokinetic training and dynamometer assessment is extensively used in sports medicine. At the present time, isokinetic training provides an important method for development of muscle strength, explosive force and for recovery of joint and muscle strength after injuries abroad. However, locally, most tests on the joints and muscle strength of athletes have been done by the isokinetic dynamometer system. The subjects that are tested are usually athletes. Differences in muscle strength of males and females were also reported by this method. Therefore, the purpose of this paper was to determine the changing pattern of isokinetic eccentric contractions of the hand ball athletes. The data produced by this study could provide some theoretical framework for coaches and athletes. This will enable those involved to make out a specific strength-training plan based on isokinetic training theory. Application of the results obtained from this study had shown that overall muscle strength of the athletes increased remarkably after winter training especially explosive force of lower extremities.

METHODS: Muscle strength was measured at two occasions, before and after winter training. Measurements included the handball players' joint strength in knee, ankle, shoulder and elbow by means of CYBEX isokinetic system. The contraction velocity of joint muscles were respectively 30°/s, 60°/s, 120°/s, 180°/s, 240°/s, 300°/s. Every velocity was repeated three times and every class interval is 10s. The explosive force of lower limb muscles under different loads was measured by KISTLER force-platform. Body constitution was evaluated by touching height, standing long jump and a 30m sprint.

RESULTS: With the increased contraction velocity, the peak torque and total work of the knee, ankle, elbow decreased, average power and acceleration of the knee, shoulder, and elbow joint muscles increased and the average power and acceleration of the ankle joints muscles showed a tendency to decrease. After winter training, explosive strength of knee-extensor, shoulder internal rotation, elbow-flexor muscles increased remarkably. The elbow extensor muscles' explosive strength also increased. However, ankle extensor muscle strength not only showed no obvious increase, there was an apparent decrease. On the contrary, shoulder external rotation muscles showed no difference.

CONCLUSION: This study suggests that maximum strength training of muscle in lower extremities, explosive strength of triceps muscle of calf and the tenacity of the shoulder external rotation should be enhanced in handball athletes.

REFERENCES:

Li G.P. (1988). An evaluation to quadriceps muscles of thigh and hamstring muscles' strength and stamina of outstanding athletes with isokinetic dynamometer. *Miscellaneous Chinese Sports Medicine*, 3.