

Apiluk Theanthong 2012: The Effects of Deep Water Running after Plyometric Training: Response and Adaptation of Indirect Symptoms of Muscle Damage. Doctor of Philosophy (Sports Science), Major Field: Sports Science, Faculty of Sports Science.

Thesis Advisor: Assistant Professor Ratre Reungthai, Ed.D. 282 pages.

The purpose of this study was to examine the effect of deep water running after plyometric training on the response and adaptation of indirect symptoms of muscle damage. Included CK and LDH in plasma, flexibility (sit and reach, range of motion (ROM) of ankle extension and flexion), maximal isometric voluntary contraction force (MVIC), drop jump (DJ) and counter-movement jump (CMJ) heights, perceived muscle soreness (SOR) and electromyography of gastrocnemius muscle during maximum and submaximum isometric contraction. The first study was to examine for one week, male sports science students from Kasetsart University were randomly assigned 10 subjects per group, deep water running group (DWR), jogging group (JOG) and stretching group (CON). The second study, male soccer players from Kasetsart University were divided 10 subjects per group. They practiced soccer program combined with plyometric training on Monday and Thursday and soccer training only on Tuesday, Wednesday and Friday. Each group performed different cool down activities as same as first study after a daily training program for six weeks. Each parameter of indirect symptoms of muscle damage were analyzed by using ANOVA. Statistical significance was set at $p \leq 0.05$.

The results showed that the indirect symptoms of muscle damage of DWR group were significantly different from JOG and CON ($p < 0.05$). Included CK (DWR < JOG < CON, 30 min., 24, 48, 72 and 96 hours; reached peak between 36 to 84 hours), ROM of ankle flexion (DWR > JOG > CON, was different at all time points) DJ และ CMJ (DWR > JOG > CON, day 3, day 7 after training for 6 weeks; all groups were at the lowest decrease after training at 24 and 96 hours), SOR (DWR < JOG < CON; different at all time points) and MDF of electromyography at MVIC (DWR < CON < JOG; 30 min., 24, 48, 72 และ 96 hours). The conclusion: the deep water running after plyometric training could help to attenuate muscle damage and enhance the recovery process. The properties of water reduced the impact of loading on the lower limb, and there was no eccentric contraction during the movement in water. Furthermore, After 6 weeks of plyometric program, muscle power, muscle strength and motor unit synchronization were improved.

Student's signature

Thesis Advisor's signature