급속과 점증체중감량이 태권도선수의 호흡교환율, 심박수 및 근력에 미치는 영향

권영우

영남대학교

Abstract

Kwon, Y. W. Effects of acute and chronic weight loss of taekwondo players on RER, heart rate and strength. *Exercise Science*. 20(3): 319-328, 2011. The purpose of this study was to investigate the effects of rapid and gradual weight loss (6%) on RER, heart rate and strength of athletes. Twenty male Taekwondo players participated in this study and were divided to rapid (RW, n=10) and gradual weight loss group (GW, n=10). RW group reduced their body weight for 3day by fluid and energy restriction and forced sweating by sauna and exercise. GW group reduced their weight for 14day by energy restriction and exercise. Exercise sessions took place on a treadmill performing 4 minutes of running to reach targeted intensity (75% HRmax) and continued during 30 minutes. After 30 minutes, work rate was gradually increased (0.9 mile per hour every 3 minutes, 2% degree elevation) until exhaustion. RER and heart rate were measured before, during (30minutes) and immediately after an incremental treadmill test to exhaustion. Muscle strength was measured from pre and post body weight loss. RER significantly increased with exercise and this exercise induced increase was lower RW group than GW group. Acute and chronic weight loss increased heart rate with exercise but their were any significant different with RW and GW. Back and grip strength did not show any significant change with weight loss, but sit up decreased significantly after rapid weight loss. In conclusion, rapid weight loss enhanced fatty acid utilization and decreased muscle strength of taekwondo player. Further study needed to elucidate the exact mechanism related to glycolytic and oxydative enzyme change with acute and chronic weight loss.

Key words : Weight loss, RER, Heart rate, Strength

초 록

권영우. 급속과 점증체중감량이 태권도선수의 호흡교환율, 심박수 및 근력에 미치는 영향. *운동과학* 제 20권 제3호. 319-328, 2011. 본 연구는 태권도선수의 급속 및 점증체중감량(체중의 6%)이 호흡교환율, 심박수, 근력에 미치는 영향을 규명하기 위한 것이다. 20명의 태권도선수가 본 연구에 참여하였으며 급속감량집단(n=10)과 점증감량집단(n=10)으로 나누었다. 급속감량집단은 3일 동안 수분과 식이제한, 사우나와 운동에 의한 발한으로 체중을 감량하였다. 점증감량집단은 14일 동안 수행되었으며 식이제한과 운동에 의하여 이루어졌다. 운동은 트레드밀을 이용하였으며 4분 이내 최대심박수의 75%강도에 도달하게 한 후 30분간 달리기를 수행하였다. 그 후 운동강도는 매 3분마다 0.9 mile/hour, 경사도는 2% 증가시켜 고갈 때까지 운동을 수행하였다. 호흡교환율과 심박수는 안정 시 운동 30분, 운동 직후에 측정되었으며 근력과 근지구력은 체중감량전과 후에 측정되었다. 결과 호흡교환율은 최대하운동에 따라 증가하였으며 급속감량집단이 점증감량집단에 비하여 감소율이 높았다. 심박수의 경우 체중감량 후 감소하였으며 급속과 점증감량에 따른 변화차이는 없었다. 근력의 경우 악력과 배근력의 차이는 없었지만 윗몸일으키기의 경우 급속감량집단이 감량 후 유의하게 감소하였다. 결론적으로 급속체중감량은 지방의 이용을 증가시키고 근력은 부분적으로 감소시키는 것으로 나타났다. 보다 명확한 규명을 위해서는 급속과 점증감량에 따른 산화효소와 해당효소의 변화와 관련된 추가적인 연구가 요망된다.

주요어 : 체중감량, 호흡교환율, 심박수, 근력

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