

Abstract

This study examined effects of periodized maximal versus explosive strength training and reduced strength training, combined with endurance training, on neuromuscular and endurance performance in recreational endurance runners. Subjects first completed 6 weeks of preparatory strength training. Then, groups of maximal strength (MAX, n=11), explosive strength (EXP, n=10) and circuit training (C, n=7) completed an 8-week strength training intervention, followed by 14 weeks of reduced strength training. Maximal strength (1RM) and muscle activation (EMG) of leg extensors, countermovement jump (CMJ), maximal oxygen uptake (VO(2MAX)), velocity at VO(2MAX) (vVO(2MAX)) running economy (RE) and basal serum hormones were measured. 1RM and CMJ improved ($p < 0.05$) in all groups accompanied by increased EMG in MAX and EXP ($p < 0.05$) during strength training. Minor changes occurred in VO(2MAX), but vVO(2MAX) improved in all groups ($p < 0.05$) and RE in EXP ($p < 0.05$). During reduced strength training 1RM and EMG decreased in MAX ($p < 0.05$) while vVO(2MAX) in MAX and EXP ($p < 0.05$) and RE in MAX ($p < 0.01$) improved. Serum testosterone and cortisol remained unaltered. Maximal or explosive strength training performed concurrently with endurance training was more effective in improving strength and neuromuscular performance and in enhancing vVO (2MAX) and RE in recreational endurance runners than concurrent circuit and endurance training.