INTRODUCTION

A central issue involving the training of professional sportsmen is the maximising of training volume whilst allowing enough time for recovery. Modern strength training often utilises multiple workouts within a single day and incorporates additional training sessions during the recovery period so that training volume can be increased (Zatsiorsky, 1995). Although there has been little research on the time course of strength recovery to optimise strength development it has been suggested that supercompensation is achieved 24 hours after completion of a session (Bompa and Cornacchia, 1998). In addition, Bompa (1999) suggests that to maximise long-term development, high and low intensity weight training sessions should be alternated within a periodized program.

This study examined the effect that a subsequent low or high intensity weight training sessions will have on the rate of force development (RFD) when performed 6hr after a high intensity weight training session and compare it to a single session protocol.

METHODS

Eight male subjects (age = 25.7 ± 5.3 yrs; height = 180.3 ± 7.2 cm; mass = 88.6 ± 11.1 kg) who had weight training experience of 6.2 ± 4.0 yrs and a squat five repetition maximum (5RM) of 112.5 ± 23.6 kg volunteered for the study.

A standardised 5-min warm up and individualised stretches were followed by sub-maximal isometric efforts of 50, 70, and 90% performed on an adapted isometric chair and the rate of force development (RFD) was measured on a strain gauge dynamometer (fixed knee angle of 90°). 3 maximal efforts were recorded over 3 seconds with 30 seconds recovery between each effort to evaluate recovery. Five sets of 5RM free weight deep squats (knee angle <90°) with three minutes rest between sets were then performed. Data collection was performed pre-training, immediately following the 5th set (t = 0 min) and at t = 30 min, 2-hr, 6-hr, 24-hr, and 48-hr post-training. A second and third training protocol was performed, 6hrs after the first, using a high (5RM) or low intensity (60% of the 5RM load) weight. Data collection preceded (t=6hr) and followed (t = 0 and 30 min) the second training session.

A 2 factor repeated measures ANOVA was used to establish significance (p = 0.05).

RESULTS AND DISCUSSION

There was no significant difference in the rate of recovery between the high or low intensity protocols up to 48 hours after the initial training session (p=0.983) and the low and high intensity conditions were not significantly different when compared to a single session protocol up to 48 hours (p=0.875).

The full recovery within 6hours in this study was similar to those of Hakkinen (1992) who found that this time period was adequate recovery when using multiple sessions within a day.

The data indicates that a second high or low intensity session 6 hours after a high intensity session facilitates a similar recovery to a single session (fig 1). However the trend of the data implies that in the baseline, single workout condition, improvements (supercompensation) in strength have peaked and are diminishing after 24 hours, which is in agreement with the observations of Bompa and Cornacchia (1998). Of interest is that the recovery curve in the high intensity condition also appears to be declining whilst in the low intensity condition the recovery curve is yet to return to pre-training levels.

Figure 1: Percentage change in RFD over 48 hours.

SUMMARY

The results of the study indicate that multiple daily sessions produce similar rates of recovery when performed in isolation. Therefore the volume of training can be increased without detrimental effects on performance. Future studies need to examine recovery over a longer time period and incorporate a number of sequential days with multiple training before being integrated into an individuals longitudinal periodized training program.

REFERENCES