Differences in Assistance Exercise Volume-Load Prescription during Fatigue Induced Resistance Training

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ABSTRACT

The common purpose of assistance lift application within resistance training is to prevent injury of sport-specific predisposed musculature by strengthening a specific muscle or muscle group. The integration of assistance exercises within standard resistance training is frequently observed, showcasing a high ecological validity of assistance exercises. However, specific prescription of assistance exercises has received little empirical examination. **PURPOSE:** Therefore, the purpose of the current investigation was to examine changes in assistance lift performance due to fatigue induced resistance training. **METHODS:** Fourteen resistance trained individuals (male = 7, female = 7, age = 20.93 ± 1.54, ht = 68.07 ± 4.16 cm, wt = 78.33 ± 12.86 kg) participated in 5 resistance training sessions. Session 1 consisted of anthropometric and skinfold testing, one repetition maximum (1RM) testing for barbell back squat (SQ) and barbell bench press (BP), and familiarization of assistance lifts. Session 2-5, involved a standardized dynamic warm up and a comprehensive resistance training session comprising 3 sets of 5 repetitions at 55%, 65%, and 75% 1RM, followed by 1 repetition maximum set at 85% 1RM for SQ and BP, ten minutes passive rest between exercises. Upon 5-minute rest, participants completed 4 sets of 2 repetitions-in-reserve for 3 assistance exercises (barbell reverse lunge [RL], barbell shoulder press [SP], and barbell bent-over row [BR]) in circuit format with 90s rest between circuits. Weight lifted and repetitions completed were recorded and combined as volume-load for each assistance lift. Total session volume-load was the sum of volume-load of all assistance exercises. In order, 72, 48, 24, and 6 h rest periods were assigned as between session recovery intentionally decreasing in time to elicit fatigue. A 3 (exercise) x 4 (session) mixed factorial ANOVA was used to determine difference in assistance lift volume-load. **RESULTS:** Due to the data violating assumptions of sphericity ($p < .001$) ANOVA test statistics are estimated using the Greenhouse-Geisser method. There is a significant main effect for assistance exercise volume-load ($p < .001$). There is no significant interaction between session volume-load ($p = .846$). Bonferroni post hoc expressed significant differences between all assistance exercises within all sessions, except, RL and SP during session 2 ($p = .476$) and RL and SP during session 4 ($p = .130$). **CONCLUSION:** These data suggest assistance exercises are inherently different and exercise specific prescriptions should be established for assistance lifts. While there was no significant interaction, Cohen's d analysis indicated a medium effect size between cumulative session volume-load of session 1 and session 3 ($d = .28$), as well as session 1 and session 4 ($d = .29$). These magnitudinal differences support assistance lift prescription modulation based on fatigue. Furthermore, research examining load, volume, and intensity prescriptions necessitates further investigation to ensure resistance training prescriptions adhere to the principle of specificity.