

Cytokine Response to Traditional and Cluster Sets in Resistance-trained Women

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ABSTRACT

Resistance exercise that incorporates intra-set rest between repetition blocks (i.e., cluster sets [CS]) can produce a smaller metabolic stress and endocrine response than traditional sets (TS). **PURPOSE:** To examine the effect of CS on the acute cytokine response in resistance trained women. **METHODS:** 12 resistance-trained women (mean \pm SE; 23.7 \pm 1.1 years; 160.1 \pm 1.5 cm; 62.5 \pm 1.7 kg; 5 \pm 1 years training) completed 3 sessions in the follicular phase. One-repetition maximum (1RM) back squat (BS) (98.7 \pm 4.1 kg), and BS:body mass (1.6 \pm 0.1) were determined in Session 1. For Session 2 (3 days post Session 1) and Session 3 (7 days post Session 2), subjects were randomly assigned to either 4 sets of 10 reps with 120 seconds (s) inter-set rest (IS) or 4 \times (2 \times 5 reps) with 30s intra-set rest and 90s inter-set rest (CS). All performed both protocols at 70% 1RM BS. Instructions were to perform every rep "as explosively as possible". Blood was collected pre-exercise (PRE), immediately after sets 1, 2, 3, 4 (IP), and at 5 (+5), 15 (+15), 30 (+30), and 60 (+60) min post-exercise and analyzed for interleukin (IL)-1 β , IL-2, IL-6, IL-8, IL 10, and IL-15. Data were analyzed using repeated measures ANOVAs (2 \times 9). **RESULTS:** A significant main effect of time ($p < 0.05$) was found for IL-1 β , IL-2, IL-8, IL-10, and IL-15. Concentration of IL-1 β was smaller at +5 (3.9 \pm 0.4 ng/mL), +15 (3.6 \pm 0.4), +30 (3.5 \pm 0.3), and +60 (3.7 \pm 0.4) compared to IP (4.1 \pm 0.4). IL-2 was greater after set 1 (10.8 \pm 1.0 ng/mL), and set 2 (11.0 \pm 1.2) compared to PRE (10.2 \pm 1.0), and smaller at +30 (9.9 \pm 1.0) compared to IP (11.0 \pm 1.0). IL-8 was greater after set 1 (8.4 \pm 0.6 ng/mL), set 2 (8.6 \pm 0.7), and set 3 (8.5 \pm 0.7) compared to PRE (8.0 \pm 0.6). IL-10 was smaller at +30 (31.3 \pm 7.4 ng/mL) compared to PRE (34.0 \pm 7.4), and also smaller at +15 (32.6 \pm 7.9), +30 (31.3 \pm 7.4), and +60 (33.4 \pm 8.6) compared to IP (38.0 \pm 8.6). IL-15 was greater at IP (15.5 \pm 4.0 ng/mL) compared to PRE (13.4 \pm 3.5), and smaller at PRE (13.4 \pm 3.5), +30 (11.9 \pm 3.3), and +60 (11.6 \pm 3.2) compared to IP (15.5 \pm 4.0). No condition \times time point effects were observed. **CONCLUSION:** Both TS and CS induced an acute cytokine response in resistance-trained women; incorporating intra-set rest (CS) did not appear to affect this cytokine response.