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Resistance training reduces T helper cytokine levels but not cardiometabolic risk factors in HIV-infected individuals receiving art

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RESISTANCE TRAINING REDUCES T HELPER CYTOKINE LEVELS BUT NOT CARDIOMETABOLIC RISK FACTORS IN HIV-INFECTED INDIVIDUALS RECEIVING ART

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KEYWORDS: HIV, lipodystrophy, resistance training, whey protein, cytokines

Lipodystrophy syndrome and cardiometabolic diseases are conditions that affect HIV-infected individuals on ART. A shift from T helper (Th) 1 to Th2 cytokine profile is associated with disease progression in these individuals and has been linked with lipodystrophy. Resistance training (RT) in combination with protein-containing nutrition has been considered an important tool to improve strength and body composition. The aim of this study was to determine the effect of combined RT and whey protein on body composition, Th1 and Th2 cytokines and cardiometabolic risk in HIV-infected individuals receiving ART. Methods: Forty HIV-infected participants (40.8 $\pm$ 7.7 yrs, 70.8 $\pm$ 16 kg, BMI 30.9 $\pm$ 7.2 kg/m²) receiving ART ($\geq$ 18 months) were randomly assigned either whey protein/progressive resistance training (PRT) (n=18), placebo/PRT (n=14) or as a control (n=8). Participants received either 20g whey or placebo (maltodextrin) pre and immediately post each PRT session. Whole body RT was performed 2/week for 3 months with loads progressing from

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40-85% of one repetition maximum (1RM). Measurements including height, weight, waist, hip, DEXA and 1RM testing were performed 48-72 hrs before (pre = T1) and after 3 months (T2) PRT program and 3 months (T3) following cessation of the PRT program. Additionally, venepuncture was performed to measure systemic immune, inflammatory and cardiometabolic risk markers. Statistical analysis included two-way ANOVA with multiple comparisons in the PRT groups and one-way ANOVA with repeated measures in the control group. Alpha was set at $p \leq 0.05$. Results: There was a significant ($p < 0.001$) main effect of time for PRT groups and control group for the HOMA-IR index. Post-hoc testing demonstrated that HOMA-IR index significantly increased from T1 to T2 ($p = 0.002$) and from T1 to T3 ($p < 0.001$) for placebo/PRT and whey/PRT groups, respectively. There was significant ($p = 0.05$) main effect of time for PRT groups for the Th2 cytokine IL-10. There was a significant main group effect for the immunity marker CD8% ($p = 0.05$), anti-inflammatory markers IL-10 ($p = 0.01$), IL-13 ($p = 0.05$) and the pro-inflammatory marker IL-12 ($p = 0.02$). Post hoc testing revealed a significant group effect with placebo/PRT lower over the 3 time points for IL-10 ($p = 0.008$) and IL-12 ($p = 0.016$). Conclusion: HIV serves as both a metabolic and an inflammatory challenge. Our study demonstrated that a PRT programme can decrease anti-inflammatory and pro-inflammatory cytokines possibly reflecting reduced systemic inflammation in HIV-infected individuals.