Profile of cytokines and soluble TNF receptors in response to moderate and intense exercises in active and remission patients with systemic lupus erythematosus

PERANDINI LA¹, SALES-DE-OLIVEIRA D¹, MELLO SBV¹, CAMARA NO², LIMA FR¹, BORBA E¹, BONFA E¹, SÁ-PINTO AL¹, GUALANO B¹,³.

1 Rheumatology Division, School of Medicine, University of Sao Paulo, Sao Paulo, Brazil.
2 Laboratory of Transplantation Immunobiology, Department of Immunology, ICB-USP, Sao Paulo, Brazil.
3 School of Physical Education and Sport, University of Sao Paulo, Sao Paulo, Brazil.

ABSTRACT

Introduction: systemic lupus erythematosus (SLE) is a rheumatic autoimmune disease characterized by chronic inflammation that is associated with clinical symptoms and disease severity. Therefore, strategies to reduce inflammation, such as physical exercise, have a potential therapeutic role in SLE due to its anti-inflammatory effects. This study sought to compare cytokines and soluble TNF receptors response to: (1) moderate vs. intense aerobic exercise in active SLE (SLEACT) and remission SLE (SELREM) patients; (2) SLEACT vs. SELREM patients undergoing moderate and intense aerobic exercises; and (3) SLE patients vs. healthy controls (HC) undergoing moderate and intense aerobic exercises. Methods: twelve SELREM (age: 35.3±5.7 yrs; BMI: 25.6±3.4 kg/m²), 11 SLEACT (age: 30.4±4.5 yrs; BMI: 26.1±4.8 kg/m²) and 10 age-and BMI-matched HC (age: 30.6±5.2 yrs; BMI: 24.1±2.3 kg/m²) performed 30-min sessions of moderate (~50% of VO₂max) and intense (~70% of VO₂max) exercises. Serum cytokines (INF-γ, IL-10, IL-6, TNF-α) and soluble receptors (sTNFR1 and sTNFR2) were measured at rest, immediately after the exercise, every 30-min during three hours of recovery, and 24 h after the end of exercise session. Results: there were no differences for cytokines and sTNFRs responses between moderate and intense aerobic exercise for SLEACT and SELREM patients (P>0.05). Similar responses were found when SLEACT and SELREM patients were compared for moderate and intense exercises, except for 1) serum TNF-α, which was lower in SLEACT than SELREM patients after moderate exercise (P<0.05); 2) serum sTNFR1, which was higher in SELREM than SLEACT patients at 30th and 60th minutes of moderate exercise recovery (P=0.027 and P=0.036, respectively); and 3) serum sTNFR2, which remained higher during both sessions of exercise and recovery for SELREM in comparison to SLEACT patients (P<0.01). Also, a time-effect was observed for serum IL-6 and TNF-α (P<0.05) after intense exercise with a posterior reduction under baseline values, reaching the values experienced by HC. Conclusion: cytokines and sTNFRs were not different in both exercise intensities for SLEACT and SELREM, except for a few differences, which pointed out to a "less inflammatory pattern" in SLEACT patients, suggesting that exercise (even more intensive) can be safely performed by SLE patients with active disease. Finally, the reduction shown in serum IL-6 and TNF-α after intense exercise in SLEACT patients supports evidences for an anti-inflammatory effect of exercise and reinforces the importance of physical exercise to SLE treatment.