Andersson H, Bøhn SK, Raastad T, Paulsen G, Blomhoff R, Kadi F. Differences in the inflammatory plasma cytokine response following two elite female soccer games separated by a 72-h recovery. Scand J Med Sci Sports. 2010 Oct;20(5):740-7. doi: 10.1111/j.1600-0838.2009.00989.x.

Abstract

We investigated changes in a large battery of pro- and anti-inflammatory cytokines in elite female soccer players following two 90-min games separated by a 72-h active or passive recovery. Blood samples were taken from 10 players before, within 15-20 min, 21, 45 and 69 h after the first game and within 15-20 min after the second game. The leukocyte count was analyzed, together with several plasma pro- and anti-inflammatory cytokines, using a multiplex bead array system. After the first and second game, the total leukocytes and neutrophils increased significantly. Likewise, increases ($P<0.05$) in pro-inflammatory cytokines [interleukin (IL)-12, tumor necrosis factor-α (TNF-α), interferon-γ (INF-γ), IL-17], chemokines [monocyte chemotactic protein-1 (MCP-1), IL-8 and monokine induced by gamma interferon (MIG)], anti-inflammatory cytokines (IL-2R, IL-4, IL-5, IL-7, IL-10, IL-13, INF-α) and the mixed cytokine IL-6 were observed. Leukocyte and cytokine levels were normalized within 21 h. Active recovery (low-intensity exercises) did not affect the cytokine responses. A dampened cytokine response was observed after the second game as only IL-12, IL-6, MCP-1, IL-8 and MIG increased ($P<0.05$). In conclusion, a robust pro- and anti-inflammatory cytokine response occurs after the first but not the second soccer game. The implications of the dampened cytokine response in female players after the second game are unknown.