Inflammatory response and neutrophil functions in players after a futsal match

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Futsal players suffer injuries resulting from muscle fatigue and contact/collision among players. Muscle lesions can be detected by measuring creatine kinase (CK) and lactate dehydrogenase (LDH) in plasma. After an initial lesion there is an increase in the plasma levels of C-reactive protein (CRP) and proinflammatory cytokines. These mediators may activate neutrophils and contribute to tissue damage, as well as increase susceptibility to invasive microorganisms. In this study, we investigated the effect of a futsal match on muscle lesion markers, cytokines and CRP in elite players. The basal and stimulated neutrophil responsiveness after a match was also evaluated based on measurements of neutrophil death, phagocytic capacity, reactive oxygen species (ROS) and cytokines production. Blood samples were taken from 16 players (26.4±3.2 yrs, 70.2±6.9 kg, sports experience of 4.4 ± 0.9 years) before and immediately after a match. Exercise increased the serum activities of CK (2.5-fold) and LDH (1.3-fold). Playing futsal also increased the serum concentrations of IL-6 (1.6-fold) and CRP (1.6-fold). TNF-α, IL-1β, IL-8, IL-1ra and IL-10 serum levels were not modified in the conditions studied. The futsal match induced neutrophil apoptosis, as indicated by phosphatidylserine externalization (6.0-fold). The exercise induced priming of neutrophils by increasing ROS (1.3-fold), TNF-α (5.8-fold) and IL-1β (4.8-fold) released in non-stimulated cells. However, in the stimulated condition, the exercise decreased neutrophil function, diminishing the release of ROS by PMA-stimulated neutrophils (1.5-fold), and the phagocytic capacity (1.6-fold). We concluded that playing futsal induces inflammation, primes/activates neutrophils, and reduces the efficiency of neutrophil phagocytosis after a match.

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