ISEI Abstract – Clinical prescriptions for exercise in athletes – what are the key messages for prevention of illness and adequate recovery for athletic populations? - 7

Running economy and cytokines: what the influence of IL-6 and IL-10?

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ABSTRACT

Introduction: During the exercise performing the muscle produce cytokines, named "myokines". These molecules show autocrine, paracrine and endocrine effects. One of them IL-6 demonstrates both pro and anti-inflammatory actions. Usually they have an anti-inflammatory action when produced by working muscles and when produced by other tissues, especially adipose, they assume a pro-inflammatory profile. Athletes´ performance, especially those that run long distances races (endurance) is associated with higher levels of maximal oxygen uptake (VO2max). Running economy (RE) is a methodology used to evaluate the performance of runners and is defined as "the rate of oxygen consumption (VO2) required for maintain a specific speed". RE is determined by the energy cost of running (Cr), which is the energy required to transport body mass in a specific running speed (km/h). Despite some studies demonstrated the importance of RE in a performance of athletes, there is no studies relating running economy and cytokines. The aim of this study was to investigate the correlation between cytokine profile and running economy. **Subjects**: Twenty-two male recreational runners living in the city of São Paulo were recruited for the study that had been approved by the UNIFESP-EPM Ethics Committee. None of the participants were using lipid-lowering medications, no smokers, addicted to alcohol consumption, obese or had systemic arterial hypertension, neither liver, renal, metabolic, inflammatory or neoplastic diseases. Methods: Blood sample was collected at rest. Blood draw for all the individuals was performed after 12 hours of fasting. IL-6 and IL-10 were measured by ELISA in serum. **Statistics:** Pearson's correlation coefficient was used to identify a correlation between Running Economy (RE) and cytokine levels. The significance level was set to 5% ($p < 0.05$). **Results and Discussion:** In the group of athletes studied we found that a significant correlation between RE and IL-6 (figure 1A), showing that runners with better RE presented decreased IL-6 levels. However, no correlation was observed in relation to IL-10 levels and RE (Figure 1B). Previously we demonstrated that pro-inflammatory cytokines influences negatively the VO2max that is used to calculate the aerobic capacity. So, we assumed that athletes with more time and volume of training would have lower levels of IL-6 which in our results is associated to greater RE. However, we couldn´t find any correlation between these parameters.

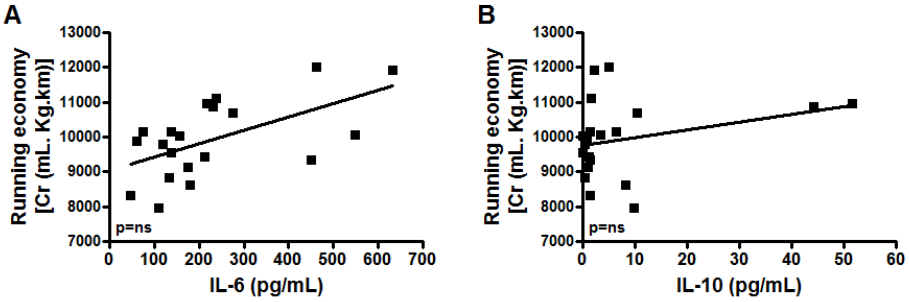

Figure 1: Corrrelation between the Runinig Economy [Cr (mL.Kg.km)] and serum IL-6 (A) and IL-10 (B) levels (pg/mL) in runners.