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ANNALS OF
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MOOD STATES AND CYTOKINE CORRELATION IN FEMALE SOCCER PLAYERS WITH AND WITHOUT PREMENSTRUAL SYNDROME (PMS)

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Keywords: inflammation, cytokines, mood states, Premenstrual syndrome, soccer

INTRODUCTION

PMS is defined as a group of physical and behavioral changes beginning in the luteal phase and ending during menstruation⁽¹⁾. It's known that intense physical activity is closely associated with changes in many aspects of immune response, such as cytokine production⁽²⁾ as well as that cytokines act on behavior and mood states (3-5). The aim of this study was to evaluate mood states and its relation with cytokine production in female soccer players with (PMS) and without PMS (nPMS) in 4 moments: before and after the game and in the two phases of the menstrual cycle: follicular and luteal.

METHODS

Fifty-two eumenorreic soccer players were evaluated (age: 19.8 ± 4.7 years). The PMS and phases of the menstrual cycle were determined by monitoring for 3 consecu-

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tive months. Evaluation of cytokines IL-1 β , IL-6, IL-8, IL-10 and TNF- α were performed in urine and quantified by Flow cytometry method. The renal function was normal, as could be verified through creatinine analysis. Mood states were evaluated through the Brunel mood scale. This study was approved by the Ethics Committee in Research, from UNIFESP (No.1604/10). ANOVA and Spearman correlation with significance level of 5% were used for data analysis.

RESULTS

No difference in renal function was found in both groups and in the 4 evaluated moments. The group nPMS showed a positive correlation of IL-10 with vigor ($p=0,05$, $r = 0,45$) and a negative correlation of IL-10 with fatigue ($p=0,05$, $r = -0,45$) in luteal phase, pre-game. The PMS group revealed positive correlations of IL-1 β in the follicular phase, post-game with anger ($p=0,05$, $r = 0,37$) and tension ($p=0,01$, $r = 0,52$); as well as the IL-1 β with tension ($p=0,05$, $r = 0,36$) in the luteal phase, post-game.

DISCUSSION

The correlation observed in the group nPMS reveals that IL-10 has a positive correlation with vigor. Moreover, the IL-1 β may contribute to the worsening of anger and tension behavioral states in the group PMS. In addition, our group has demonstrated that athletes with PMS are affected by an inflammatory state with higher levels of pro-inflammatory cytokines production.

• 197

CONCLUSION

The results observed in this study show that the anti-inflammatory cytokine is correlated with the emotion considered positive in the nPMS athletes, while the considered negative emotions are shown to be correlated with pro-inflammatory cytokine in the PMS athletes, reinforcing that the expression of different emotions in sport environment can be influenced by neuro-immuno-endocrine mechanism.

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