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Publicado por: Imprensa da Universidade de Coimbra

URL persistente: URI:<http://hdl.handle.net/10316.2/44127>

DOI: DOI:https://doi.org/10.14195/2182-7087_ex2018_64

Accessed : 26-Apr-2023 11:36:14

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CHANGES IN THE IMMUNE RESPONSE DURING AN ATHLETICS TRAINING AND COMPETITION SEASON IN 800 M HIGH-LEVEL ATHLETES

Beatriz Bachero-Mena¹; Fernando Pareja-Blanco¹; Juan José González-Badillo¹

INTRODUCTION

White blood cells are an important part of the immune system, playing a role in defense against disease agents. The immune system may be affected by the level of activity in which an athlete is engaged ⁽¹⁾. Through several mechanisms, the immune system may be depressed during intense endurance activity, resulting in an increased risk of illness or infection ⁽²⁾. The aim of this study was to analyze the changes in the immune response during a complete athletics season in 800 m high-level athletes.

METHODS

Thirteen male athletes of national and international level in 800 m (personal best ranging from 1:43 to 1:58 min:ss) participated in this study (age: 22.9 ± 5.3 years; height: 175.2 ± 5.5 cm; body mass: 62.9 ± 4.4 kg). A total of 3 blood samples tests (T1, T2, T3) were taken from October to June, every 4 months. The participants were asked to rest from training the day before the sampling. Before blood sampling the athletes rested on a bed for at least 10 minutes. Blood samples were taken from the athlete in supine position from the antecubital vein by a qualified laboratory technician using the Vacuette system and collected in tubes containing EDTA K 3 (3 ml). White blood cells (WBC), neutrophils, lymphocytes, monocytes, eosinophils, basophils, platelets and mean platelet volumen (MPV) counts were measured using hematology analyzer XN-9000 (Roche Diagnostics, USA). One-way ANOVA and post-hoc Bonferroni method with significance level of 5%, were used for data analysis.

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RESULTS

Significant decreases in WBC ($P < 0.05$), neutrophils ($P < 0.05$), and monocytes ($P < 0.05$) were observed from T2 to T3. Significant increases occurred in MPV ($P < 0.05$) from T1 to T3, and from T2 to T3. The rest of the parameters analyzed did not show significant variations.

CONCLUSION

Significant decreases occurred in WBC, neutrophils, and monocytes from T3 to T5, suggesting a depression of the immune system at the end of the season. This finding is in line with Horn et al. ⁽³⁾, who observed a decreased number of monocytes and WBC in triathletes. This depressed response observed in our study could be due to the more intense and specialized exercises performed during the summer competition period (from T2 to T3), and could increase the risk of illness or infection. Besides, the significant increase of MPV is consistent with the well-established evidence that aerobic physical activity is effective to enhance circulating activated platelets ⁽⁴⁾. Therefore, monitoring the immune response in athletes may help coaches and athletes to optimize the regulation of training contents and may be useful to diagnose states of overreaching or overtraining in athletes.

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