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Fatiguing exercise alters leukocyte subpopulation frequency in the bone marrow and peripheral blood in C57BL/6 mice

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FATIGUING EXERCISE ALTERS LEUKOCYTE SUBPOPULATION FREQUENCY IN THE BONE MARROW AND PERIPHERAL BLOOD IN C57BL/6 MICE

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KEYWORDS: physical exercise, immune function, leukocytes.

Previous studies have demonstrated the influence of intense exercise on immune function including changes in the population of leukocytes such as neutrophils, lymphocytes and monocytes on the blood circulation. A common finding is that the numbers of leukocytes subpopulation alters after different protocols of exercise.

AIM

Here, we investigated the effects of progressive fatiguing exercise protocol on the leukocytes frequency on the blood circulation and in the bone marrow in the C57BL/6.

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METHODS

An electric treadmill was used for the fatiguing exercise protocol. The initial speed was set at 5 meters per minute (m/min) for 30 minutes to familiarize the mice with the appa-

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ratus and task. The speed was then increased 1 m/min every 3 min, at a 5% grade, until the animal stopped running and was fatigued, which was judged by the refusal of the mouse to continue moving on the treadmill belt more than 10 seconds. The control group did not perform fatiguing exercise protocol and exercised group exercised until fatigue by running for 56.3 ± 6.8 min. Blood and bone marrow were collected by 1 h after the end of exercise and analyzed in flow cytometry for the following markers: Ly6C-monocytes, Ly6G-neutrophils and CD3-T cells.

RESULTS

The results show that after 1 hour of the end of fatiguing exercise protocol, C57BL/6 mice, there was an increase in the frequency of neutrophils (from 22.8% to 48.6%) and monocytes (from 34.8% to 70.5%) in the blood while there was elevation of the lymphocyte population (from 5.5% to 8.1%) in the bone marrow. We believe that this profile may undergo modifications in later times and we are working in this proposal. **Conclusion:** Taken together, these results suggested that the fatiguing exercise protocols induces immunological changes and provokes significant, although transient, modulation of the immune system, specifically of the leukocyte sub-population.