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EXHAUSTING EXERCISE IN YOUNG RATS: EFFECT ON SYSTEMIC AND INTESTINAL LYMPHOID TISSUES

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KEYWORDS: exhausting exercise, mucosal immune system, lymphoid tissues

While moderate exercise has an enhancing effect on immune system, exhausting exercise can be harmful^(1,2). In this context, animal models in which an exercise-derived immunodepression could be reproduced are very limited. The aim of this study was to establish immune markers of exhausting exercise both in the systemic and mucosal lymphoid tissues of rats reflecting the depression of the immune function. Young female and male Wistar rats were trained in an increasing procedure in a treadmill for 4 weeks. Afterwards, rats were submitted to an exhaustion protocol in the same treadmill. Blood and faeces were collected throughout the study. Macrophages were isolated from peritoneal cavity and small intestine were dissected. In addition, the weight of gastrocnemius muscle, heart and lymphoid tissues were registered. Results showed a different exercise pattern between males and females, being young females better runners than young males. Runners had higher gastrocnemius muscle and heart weights than sedentary rats, whereas spleen and thymus weight were lower in runner rats. Reactive oxygen species increased in macrophages from runner rats. Intestinal immune markers showed that faecal IgA decreased by training. In addition, the gene expression of occludin (as a marker of intestinal barrier function) was reduced in runner rats whereas that of mucin was increased. In conclusion, the increasing training exercise applied in rats for 4 weeks followed by an exhausting session produced a harmful effect on systemic and intestinal immune system that can be quantified by lymphoid tissue weights and faecal IgA, as well as intestinal barrier markers.

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