

Abstract

# Effects of Plant-Origin Superoxide Dismutase Supplementation on Selected Parameters of Inflammation and White Blood Cell Count in Athletes <sup>†</sup>

Olina Dudašova Petrovičova <sup>1,\*</sup>, Ivan Stanković <sup>1</sup>, Brižita Đorđević <sup>1</sup>, Neda Milinković <sup>1</sup> , Violeta Dopsaj <sup>1</sup> and Milivoj Dopsaj <sup>2</sup> 

<sup>1</sup> Faculty of Pharmacy, University of Belgrade, Vojvode Stepe 450, 11221 Belgrade, Serbia; istank@pharmacy.bg.ac.rs (I.S.); brizitadjordjevic@gmail.com (B.Đ.); nedan@pharmacy.bg.ac.rs (N.M.); violeta.dopsaj@pharmacy.bg.ac.rs (V.D.)

<sup>2</sup> Faculty of Sport and Physical Education, University of Belgrade, Blagoja Parovića 156, 11000 Belgrade, Serbia; milivoj.dopsaj@gmail.com

\* Correspondence: olina.dudasova@gmail.com

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**Abstract:** Background and objectives: Regular moderate exercise is considered a protector against chronic inflammatory diseases. Intense exercise causes a significant release of pro-inflammatory cytokines and free radicals depending on exercise intensity and duration. The aim of this study was to investigate the effects of antioxidant supplementation on parameters of immunity and inflammation in athletes. Methods: The study included 14 elite rowers (group 1) and 10 recreational athletes (group 2). All participants were supplemented with 500 mg/day (500 IU SOD) plant-origin superoxide dismutase (Glisodin®) during a 6-week pre-competition microcycle preparation period (rowers, 120 min training/6 days weekly; recreational athletes, 60 minutes training/3 days weekly). Venous blood samples were taken in the morning after a 24-hour resting period. White blood cell (WBC) and its subpopulation count were determined using an AcT Diff Hematology Analyzer (Beckman Coulter, Inc., Brea, CA, USA) and CRP concentration using the biochemistry analyzer Olympus AU400 (Beckman Coulter, Inc., Brea, CA, USA) at the Faculty of Pharmacy, University of Belgrade. Selected cytokines IL-4, IL-6, IL-8, and IL-10 were measured by hs ELISA kits (R&D Systems). All data were analyzed using nonparametric tests (Mann–Whitney U test, Kruskal–Wallis test). Results: WBCs and their subpopulation were all in the reference range in both groups before and after supplementation, without significant differences within and between groups according to tests considering supplementation. In rowers, IL-6 was significantly higher before and after supplementation ( $p < 0.001$ ,  $p < 0.001$  respectively), CRP was higher before supplementation ( $p = 0.025$ ), and IL-10 was higher at initial and final testing ( $p = 0.030$ ,  $p = 0.040$  respectively). In the recreational group, IL-8 and IL-4 were higher at both measuring points ( $p < 0.001$  and  $p < 0.01$  respectively). Observing changes in variables within the groups, there was a significantly decreased level of IL-6 ( $p = 0.019$ ) and increased level of IL-4 ( $p = 0.001$ ) in rowers and a higher IL-4 level in the recreational group ( $p = 0.059$ ) after supplementation. Discussion: The results of this investigation indicate that there are positive effects of Glisodin supplementation on parameters of inflammation (decreased IL-6, increased IL-4), especially in highly trained rowers, who are more prone to exercise-related oxidative stress. More studies including a greater number of participants are necessary to confirm the influence of antioxidant supplementation on immunity and inflammation in athletes.

**Keywords:** athletes; Glisodin; supplementation; inflammation

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