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Abstract

Acute Aronia Juice Consumption Affect HSA Thiol Group Content in Recreational Runners after Simulation of Half-Marathon Race †

Marija Takić [1,*], Tamara Uzelac [2], Vuk Stevanovic [1], Nevena Vidovic [1], Ana Pantovic [1], Maria Glibetic [1] and Vesna Jovanovic [2]

[1] Institute for Medical Research, National Institute of Republic of Serbia, Center of Research Excellence in Nutrition and Metabolism, University of Belgrade, 11000 Belgrade, Serbia; vuk.stevanovic@imi.bg.ac.rs (V.S.); nevena.vidovic@imi.bg.ac.rs (N.V.); jelenkovicana5@gmail.com (A.P.); mglibetic@gmail.com (M.G.)
[2] Faculty of Chemistry, Department of Biochemistry and Centre of Excellence for Molecular Food Sciences, University of Belgrade, 11000 Belgrade, Serbia; tamarauzelac31@gmail.com (T.U.); vjovanovic@chem.bg.ac.rs (V.J.)
* Correspondence: marijapo2001@gmail.com
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Abstract: Aronia melanocarpa berries and their products are rich dietary sources of antioxidant compounds with polyphenolic structures, including anthocyanins, flavonoids, procyanidins and phenolic acids. Physical activity (PA) can lead to oxidative stress and reduced thiol group of human serum albumin (HSA-SH). HSA-SH is the key component of the antioxidant system for maintaining serum thiol homeostasis. In this study, the main goal was to examine the effect of aronia juice supplementation before a race on thiol homeostasis in 10 recreational runners, in a single blind crossover placebo-controlled study. Total serum thiols, HSA-SH group content and reactivity, and free fatty acids (FFAs)/HSA ratios were determined before, 15 min (T1), 1 h (T2) and 24 h (T3) after the simulation of a half-marathon race and the consumption of aronia juice (AG) or placebo (PG) before the race. Reduced thiols content and the pseudo-first order kinetic constant of the HSA-SH group's reactivity were determined using 5,5′-dithiobis-(2-nitrobenzoic acid) reagent. Accordingly, PA led to transient oxidative stress, which decreased the HSA-SH group's content in T1 compared to the baseline, and when compared to the AG ($p < 0.01$, and $p < 0.05$, respectively), but there was no significant change in total thiol content. At the same time, the HSA-SH group's reactivity and FFA/HSA ratio increased significantly in T1 and T2 in both groups compared to corresponding baseline values. The positive effect of acute aronia juice consumption on the oxidative stress by reducing oxidative damage of HSA-SH group during PA was revealed in the study. Also, this study indicated that HSA-SH content is a more reliable parameter for the evaluation of oxidative stress during PA than the analysis of total serum thiols.

Keywords: polyphenols; antioxidants; sports nutrition

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