Influence of the administration of flavonoids on the exercise capacity in rats

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Abstract

Background. The antioxidant role of flavonoids, demonstrated particularly in vitro, justifies the studies on their potential protective effects under physical exercise conditions associated with oxidative and nitrosative stress.

Aims. The influence of the administration of flavonoids on the aerobic exercise capacity was studied in rats performing physical exercises of various intensities.

Material and methods. The research was performed on 5 groups of white male Wistar rats (n = 10 animals/group) trained on the treadmill for 21 days: group I – control group; group II – supplemented with flavonoids; groups III, IV and V – supplemented with flavonoids, with 5%, 10% and 15% loading, respectively. The time moments included in the study were days 1, 3, 6, 9, 12, 15, 18 and 21.

Results. The running time was significantly longer in group II compared to other groups on all days, except for T_3, when it was not different from group I. The running time was significantly longer in group I compared to groups III, IV and V at T_1, T_3, T_6 and T_9, it was not different at $T_{12,}$ T_{15} and T_{18}, and it was different at T_{21}. The running time was significantly different between T_1-T_{21}, T_3-T_6, T_6-T_9, T_9-T_{12}, T_{15}-T_{18}, T_{18}-T_{21} in all groups. The running time was significantly different between T_1-T_3 and T_{12}-T_{15} in all groups, except for group II.

Conclusions. 1) Flavonoids have significant ergotropic effects, in animals undergoing physical exercise tests without loading for 21 days. 2) The administration of flavonoids and concomitant physical exercise for 21 days with 5%, 10% and 15% loading, respectively, causes a diminution in the ergotropic effects of flavonoids.

Keywords: flavonoids, physical exercise, aerobic exercise capacity.