Comparison of the blood plasma catecholamines level in Thoroughbred and Arabian horses during the same-intensity exercise

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Abstract

The aim of this study was to compare changes in epinephrine (E), norepinephrine (NE) and dopamine (DA) levels in blood plasma of two racehorses breeds: Arabian and Thoroughbred during moderate intensity exercise performed in the same conditions.

The increase in plasma E level just after exercise was higher in Thoroughbreds than in Arabians. During the whole test, the Arabians showed the higher levels of NE and DA as compared to those found in Thoroughbreds.

Key words: catecholamines, training, Arabian and Thoroughbred horses

Introduction

Thoroughbred and Arabian horses take part in similar competitions on the racetracks, but they are different from genetic point of view. The muscles of Arabians are richer in type I fibers with better ability to lipids oxidation; Thoroughbreds on the contrary, with higher amount of fast type II fibers, show a preference in the utilization of glucose involving a higher production of lactic acid (LA) (Snow and Guy 1980). During the physical exercise, the sympathoadrenal activity increases, what is reflected by the rise of catecholamines level in blood of investigated subjects. In horses, the blood levels of epinephrine (E) and norepinephrine (NE) rise during exercise tests and also in response to stress (Snow et al. 1992, Tischner et al. 2005). The plasma dopamine (DA) concentration has been less studied in exercised horses.

The purpose of the present study was to compare changes in catecholamines level induced by the same work, which was realized in the same conditions, in two racehorse breeds: Thoroughbreds and Arabians.

Materials and Methods

The effect of moderate intensity exercise was studied in 20 stallions – ten Thoroughbreds aged 2-3 years and 10 Arabians 3-4 years old. The horses were trained and maintained in the same racetrack (Warsaw Sluzevic, Poland) and they had already competed in official races before the beginning of the study.