Abstract

Title: Analysis of selected gene variants in athletes – runners at 400 m

Objectives: This work aims to find out what the genetic profile of athletes – runners at 400 meters, who are working in lactate mode, looks like.

Methods: A cross-sectional investigation involved 203 East European Caucasian males and was conducted collaboratively at the FTVS UK and Józef Piłsudski University of Physical Education in Warsaw (AWF Warsaw). The athletes, after a brief warm-up, participated in a single 30-second Wingate test. DNA samples were collected non-invasively through saliva swabs. Lactate levels were measured using an invasive approach.

Results: In the polymorphisms rs4646994 gene *ACE* was found to have a significant difference in genotypic ($p = 0.001$, $x2 = 14.90$) and allelic ($p = 0.004$, $x2 = 8.52$) frequencies between the overall athlete group and the controls. A notable difference in the *ACE* gene showed the comparison of the genotypes ($p = 0.001$, $x2 = 13.66$) and between the alleles ($p = 0.003$, $x2 = 8.89$) between the control group and elite athletes. The last statistically significant difference was observed among the genotypes ($p = 0.03$, $x2 = 6.79$) between the sub-elite athletes and the control group. When assessing the genotypic and allelic frequencies for the polymorphisms rs1815739 in the *ACTN3* gene, we identified no significant differences in either genotypic frequency ($p = 0.33$, $x2 = 2.25$) or allelic frequency ($p = 0.82$, $x2 = 0.05$).

Keywords: Genetic, *ACE, ACTN3,* athletes, runners at 400 meters, endurance performance, power and strength performance