

THE PPARA GENE POLYMORPHISM IN TEAM SPORTS ATHLETES

Abstract. Peroxisome proliferator-activated receptor α (PPAR α) is a transcription factor that regulates lipid and glucose metabolism. Accumulating evidence suggests that the intron 7 C allele of the PPARA gene rs4253778 G/C polymorphism has an advantage for power-oriented athletes, presumably due to the hypertrophic effects on skeletal muscle and increase in glucose utilization in response to anaerobic exercise. The G allele, however, is said to be favorable for the endurance-oriented athletes. The metabolic demands of team sports involve aerobic and anaerobic energy pathways, as a result of the intermittent physical activity. The aim of the present study was to investigate the association between the PPARA gene polymorphism and team-sport athletic status. A total of 665 Russian athletes from 14 team sports and 1,706 controls were involved in the case-control study. We found that the frequency of the PPARA C allele was significantly higher in athletes compared to controls (20.5 vs. 16.4%, $P = 0.0009$), suggesting that anaerobic rather than aerobic metabolism may be crucial to the game performance in team sports. This means that our study indicates the association between the PPARA gene G/C polymorphism and team-sport athletic status. Although more replication studies are needed, the preliminary data suggest an opportunity to use the analysis of PPARA polymorphism, along with other gene variations and standard phenotypic assessment in team sports selection.