ACE, FTO AND VDR POLYMORPHISMS ARE ASSOCIATED WITH MORPHOLOGICAL CHARACTERISTICS OF THE ELITE ROCK-CLIMBERS

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The aim of the study was to examine possible relationships between I/D polymorphism of ACE, T/A polymorphism of FTO and G/A polymorphism of VDR genes with selected anthropometrical characteristics among 12 (6 males and 6 females) elite rock-climbers, aged from 20 to 30 years. Polymorphisms of these genes are associated with physical capacities (ACE), increased risk of fat accumulation (FTO) and decreased bone mineral density (VDR). Detailed anthropological characteristics of this investigated group are presented in our previous article (Gaydamakina et al., 2013). The program included standard anthropometric measurements (Bunak, 1941). For molecular genetic analysis buccal smears were collected. Genome DNA was extracted with the technique of alkaline extraction. Genotypes were determined with the minisequencing technique followed by MALDI-TOF detection (Ross et al., 1998). Statistical analysis was performed with the software «Statistica 8.0». Results: the distribution of the genotype frequencies of all examined genes are not in accordance with the Hardy–Weinberg equilibrium. Each person in the investigated sample carries at least one insertion (I) allele of the ACE gene, which could reveal increased aerobic capacities of the elite rock-climbers. There are no AA genotype carriers of the FTO gene among the investigated athletes. Thus, elite rock-climbers do not have genetically determined risk of an increased fat accumulation. Previously it was shown that peak mineral density is decreasing in the rock-climbers compared with other athletes (Sherk et al., 2010). In the total sample only two persons have GG genotype of the VDR gene, which determines normal bone mineral density. Most of the participants (83%) carry at least one mutant (A) allele, which determines a decreased bone mineral density. The investigation of three molecular-genetic makers ACE, FTO and VDR among the elite rock-climbers has shown the following tendencies: the occurrence of I-allele of the ACE gene, T-allele of the FTO gene and A-allele of the VDR gene. Our results correspond with the investigations by other authors (Djarova et al., 2013; Sherk et al., 2010) and with our previous study of morphological characteristics of the elite rock-climbers (Gaydamakina et al., 2013). This research is supported by the RFBR grants #13-06-00702.

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