ASSOCIATION OF MYF6 AND PGC1A GENE VARIANTS WITH POWER PERFORMANCE AND MUSCLE SIZE IN BODYBUILDERS

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Genetic influence on power performance and extremity circumferences has been suggested by family and twin studies. However, little is known about the effect of particular gene variants on muscle strength and size in bodybuilders. The aim of the present study was to reveal an association between myogenic factor 6 (MYF6, rs3121), peroxisome proliferator-activated receptor-gamma (PPARG, rs1801282), and peroxisome proliferator-activated receptor-gamma coactivator-1-alpha (PGC1A, rs8192678) gene polymorphisms and several physiologic, anthropometric and compositional parameters in professional bodybuilders and female bodyfitness athletes. Sixty one male and female Russian athletes of regional or national competitive standard were recruited from bodybuilding (males, n=40) and bodyfitness (females, n=21). Subjects were questioned about their best results in powerlifting squat, bench press and deadlift. For musculature estimation four extremity circumferences were measured with a tape at the right side of the body. The measures of interest were extended upper arm (EAC), forearm (FC), calf (CC), and thigh (TC). Absolute and relative muscle mass was evaluated using equations formulated by Matiegka. Genotyping for the gene variants was performed by PCR-RLFP. In males, PGC1A Ser allele carriers (Gly/Gly – 160 (23) kg, Gly/Ser – 186 (49) kg; P=0.047) demonstrated greater results in bench press, and MYF6 C allele carriers in deadlift (CC+CT – 231 (37) kg, TT – 195 (47) kg; P=0.023). As expected, in bodybuilders power-related PGC1A Ser allele was associated with greater EAC (Gly/Gly – 37.6 (3.7) cm, Gly/Ser – 40.1 (4) cm; P=0.05), TC (Gly/Gly – 62.2 (4.5) cm, Gly/Ser – 65.7 (5.7) cm; P=0.042) and absolute muscle mass (50.1 (7.2) kg vs. 56.8 (7.8) kg; P=0.038), whilst MYF6 C allele carriers exhibited greater relative muscle mass (CC – 58.4 (2.3)%, CT – 57.4 (5.9)%, TT – 54.9 (9.1)%; P=0.016). Thus, MYF6 C and PGC1A Ser alleles are associated with better power performance and muscle mass gain in bodybuilders.

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