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Association between the GALNTL6 polymorphisms and power-oriented athletes

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INTRODUCTION:

N-acetylgalactosaminyltransferase-like 6 (GALNTL6) polymorphisms are associated with various categories such as memory, smoking behavior, and body size (GWAS catalog). Recently, the GALNTL6 rs558129 polymorphism has been associated with sports performance (Rankinen et al., 2016, Díaz Ramírez et al., 2020, Zmijewski et al., 2021). Therefore, this study aimed to compare the gene frequency of GALNTL6 rs558129 polymorphism between power-oriented athletes and controls (Study 1) and to detect other power athletic status-related genotypes by comprehensive polymorphism analysis in the GALNTL6 gene region in wrestlers and controls (Study 2).

METHODS:

Study 1 enrolled 1,515 Japanese subjects, including 376 elite power-oriented athletes who competed in national and international competitions, including the Olympic games (257 men and 119 women), and 1,139 controls (448 men and 691 women). The sports practised by the power-oriented athletes were wrestling (n = 146), weightlifting (n = 151), and powerlifting (n = 79). The analysis of GALNTL6 rs558129 polymorphism was performed by TaqMan SNP Genotyping Assay using DNA extracted from saliva (Oragene-DNA Kit). Study 2 included 33 elite wrestlers and 211 controls, and the comprehensive polymorphism analysis was conducted. The comprehensive polymorphism analysis in the GALNTL6 gene region (162 SNPs) was genotyped using the Japonica Array v2. The p-value < 0.0003 (0.05/162) was considered statistically significant.

RESULTS:

No significant difference in polymorphism frequencies between all power-oriented athletes and controls in Study 1 was found. On the other hand, the frequency of the TT genotype of rs558129 was significantly higher in wrestlers compared to that in the controls (p = 0.044). In the Study 2, there was no significant difference in GALNTL6 polymorphisms. The top SNP of the GALNTL6 polymorphisms were the rs10622983 polymorphism (p = 0.002).

CONCLUSION:

The TT genotype of the GALNTL6 rs558129 polymorphism was only associated with wrestlers. Furthermore, GWAS showed that the GALNTL6 rs10622983 polymorphism was most relevant in wrestlers.

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