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UDP-glucuronosyltransferase 2B17 genotyping in Japanese athletes and evaluation of the current sports drug testing for detecting testosterone misuse by female athletes

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Abstract

Uridine diphospho-glucuronosyltransferase 2B17 (UGT2B17) is the most active enzyme in testosterone glucuronidation. The distribution of UGT2B17 genotypes together with urinary androgenic steroid profiles in Japanese athletes (255 male and 256 female) was investigated. The applicability of steroid profiling and carbon isotope ratio analysis in Japanese female volunteers (*del/del*: n=6, *del/ins*: n=3, *ins/ins*: n = 1) after a small intramuscular dose of testosterone enanthate (100 mg) was also discussed.

The distribution rates of the UGT2B17 deletion (*del/del*) in Japanese male and female athletes were 74.5% and 60.2%, respectively. The prevalence of the UGT2B17 deletion genotype was extremely high in Japanese athletes. The testosterone to epitestosterone (T/E) ratio in the *del/del* group was significantly lower than that in the other groups. After the administration of testosterone to female volunteers, the T/E ratios for the *del/del* individuals failed to reach the positivity criterion of 4. By contrast, in all of the *del/del* subjects, the carbon isotope ratio analysis successfully fulfilled the positivity criterion. The overall result has demonstrated the limited effectiveness of population-based T/E ratios in screening tests for testosterone misuse. Subject-based steroid profiling with UGT2B17 genotyping will be an effective strategy for detecting testosterone misuse.

For the complete paper, please refer to:

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