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Influences of musk administration on the profiles and the carbon isotope ratios of urinary steroids

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Abstract

Musk is the dried secretion of the musk pod (sac) of adult male deer. It is widely used as a traditional drug in East Asia with an oral dosage of 0.03 - 0.1 g per day. The application of musk pod formulation was regarded as the reason of some adverse analytical findings in the 2011 FIFA Women's World Cup. In order to investigate the influence of musk administration on the doping test, raw material analysis and excretion study was executed. The carbon isotope ratios of steroids in four batches of musk were determined by GC/C/IRMS. Two healthy male volunteers were orally administered a single dose of 100 mg of musk (subject A for musk from wild deer, and subject B for musk from domestic deer respectively). Spot urine samples were collected from volunteers before and after administration. The profiles and carbon isotope ratios of urinary steroids were determined by GC-MS and GC/C/IRMS. The $\delta^{13}\text{C}$ -values of steroids from wild deer musk showed more depleted than those of domestic deer musk by GC/C/IRMS analysis. Some musk grains had steroids with ^{13}C values in the range reported for naturally produced steroids in human body, which make it hard to detect the possible abuse of this kind of musk by IRMS. The single oral administration of 100 mg musk showed no significant impact on the urine steroids profile and carbon isotope ratios from 0 to 48 hours after administration.

References

He Y, Wang J, Liu X, Xu Y, He Z. (2013) Influences of Musk Administration on the Doping Test. *Steroids* **78**(11):1047-1052. doi: 10.1016/j.steroids.2013.06.010.