

PROJECT REVIEW

“Monitoring of endogenous steroids in female serum”

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Androgenic anabolic steroids (AAS) misuse is widespread in sports and represents the majority of adverse analytical findings reported by WADA-accredited laboratories. The steroid profile of the athlete is routinely monitored by GC-MS(/MS) analysis of urine samples limited to a series of selected endogenous steroid compounds. Nevertheless, the urinary steroid profile suffers from the complexity of this matrix that can influence its interpretation. To overcome those limitations, measurements of blood steroids using UHPLC-MS has proven to be an interesting and complementary strategy.

Additional testosterone produces a great advantage in sports and in particular in women. Indeed, excess production of endogenous testosterone due to inborn disorders of sexual development may convey a competitive advantage. The production of endogenous testosterone is 20 to 30 times higher in males than female which suggests that females have the capacity to gain a greater relative increase from AAS use than males. This hypothesis underlines the scarce knowledge on the biological response to the use of steroids in female subjects. Indeed, a majority of clinical trials investigating steroid administration and the consequent urinary or blood steroid profiles has been achieved only with male subjects. The lack of similar female-based trials thus represents a major challenge for the understanding in gender metabolism's differences and the interpretation of female athletes' profiles.

Therefore, the goal of this project is to monitor different classes of endogenous serum steroids using UHPLC-MS in female subjects for the detection of steroids. This approach will more importantly point out main differences in metabolism between male and female subjects that have never been explored before either. It will also help for the distinction between doping with steroids and hyperandrogenism in female athletes. Finally, a direct comparison between urinary and blood steroid profile in women subjects will be possible.