PROJECT REVIEW

"Exogenous DHEA administration and performance: Possible mechanisms of action and metabolic signature”

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It is generally accepted in the sporting world that dehydroepiandrosterone (DHEA) use enhances physical performance, and DHEA therefore figures on the World Anti-Doping Agency (WADA) list of prohibited substances in sports, both in and out of competition. DHEA is a weak androgen that needs conversion to more potent testosterone, and the assumption is that athletes expect a significant increase in circulating testosterone through exogenous DHEA administration, with a subsequent improvement in performance. The literature on the ergogenic effects of DHEA intake is nevertheless very scant, and to our knowledge none of the studies has presented evidence that DHEA use improves athletic performance. However, this does not mean that an effect should be ruled out as these studies were focused on young male athletes, and no study has yet investigated DHEA effects in female athletes. Most of the time, the urine concentrations of endogenous DHEA are lower than 100 ng/mL in athletes, but in some cases concentrations may reach 200 ng/mL. It was recently demonstrated that exogenous DHEA administration impacted not only DHEA itself, but also the two metabolites, 5α-androstane-3α,17β-diol and 5β-androstane-3α,17β-diol, both of which are included in the steroidal module of the Athlete Biological Passport. However, there are no studies on how DHEA affects the other steroids included in this steroidal module.

We therefore propose to more fully investigate DHEA action during exercise, with a particular focus on:

1) the ergogenic impact of this drug in men and women during supramaximal and maximal exercise, using validated laboratory and field tests;

2) the metabolic and endocrine responses after DHEA administration;

3) the concentrations of urine steroids after physical exercise, in order to determine the metabolic signature of DHEA use as part of the steroidal module of the Athlete Biological Passport.