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Nandrolone affects leydig cells function: A pilot *in vitro* study

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Anabolic androgenic steroids (AAS) are some of the most commonly drugs used among athletes, frequently in combination with resistance training, to improve physical performance or for aesthetic purpose. A number of scientific reports showed the detrimental effects of AAS on different organs and tissues. In particular, AAS are known to suppress gonadotropin releasing hormone, luteinizing hormone and follicle-stimulating hormone. The evidence coming from studies performed on animal models suggest a direct testicular toxicity due to synthetic AAS use; however, the mechanisms causing this reduction have not been elucidated. Consequently, the use of *in vitro* assays could help to assess the effects of AAS on Leydig cells and to understand the complex pathophysiology of AAS induced reproductive disorders. In this study we investigated the *in vitro* effects of an AAS, nandrolone, onthe testosterone biosynthesis pathway in Leydig cells and on stress associated proteins, by various methods, including quantitative PCR, western blotting and confocal microscopy. Results showed thatnandrolone treatment decreased the expression of Cyp11A1 (cholesterol side-chain cleavage enzyme), Cyp17A1 (17α-hydroxylase/17, 20 lyase), whereas STAR (steroidogenic acute regulatory protein), and HSD3B1(3-beta-hydroxysteroid dehydrogenase/delta-5-delta-4 isomerase)were upregulated. These results shed light on the mechanisms that may determine a reduced production of testosterone in Leydig cells at the base of the male infertility of the AAS abusers. Further studies are necessaries to confirm these results and to better clarify the extent to which heavy AAS use might contribute to primary gonadal failure.

Biography

Cristoforo Pomara graduated in Medicine at the University of Palermo. He was awarded a PhD in Diagnostic and Therapeutic Methodologies in Surgery and Forensic Sciences. He's Associate Professor of Forensic Science, University of Foggia, Associate Professor of Anatomy, University of Malta and Director of Division of Toxicology and Histopathology of Forensic Dep. Hospital "Tatarella", Cerignola. In 2012 he was awarded the research trust "Fund for Basic Research", FIRB 2012, presenting the project entitled "The abuse/addiction of anabolic steroids and new psychoactive substances (Smart Drugs) as a deleterious social stigma in terms of both health and legal issues. Organ damage in the younger generation of athletes: epidemiological, biochemical, pathological and toxicological evidence, as well as control mechanisms." From August 2014 he has established a laboratory for basic research and animal studies, in which he is experimenting with techniques of molecular biology, cardiac electrophysiology, and neurophysiology in animal models.

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