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Understanding alterations on blood and biochemical parameters in athletes that use dietary supplements, steroids and illicit drugs

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Abstract

In recent years it was verified there are an alarming growing number of teenagers and young adults using a combination of dietary supplements (DS) anabolic androgenic steroids (AAS) and drugs of abuse. This practice is used to improve physical fitness and appearance, may cause serious side effects. This article shows the alterations in the hematological and renal function parameters associate with these substances in 40 athletes. This research involved three steps: 1- the administration of a self-completion questionnaire; 2- the assessment of hematological and biochemical parameters of renal function and; 3 - toxicological urinalysis. Hematological and biochemical tests were conducted in an accredited laboratory and the toxicological urinalysis was validated in our laboratory using liquid-liquid extraction (LLE) and gas chromatography – mass spectrometry (GC-MS). The testosterone levels in the participants who consumed steroids increased 20 to 60% and alterations in serum creatinine, urea and uric reached values of up to 1.9; 60.6 and 7.5 mg/dL, respectively. The toxicological urinalysis supports self-reports confirming the use of AAS and recreational drugs, putting at risk the health of those athletes increasing the chances of kidney diseases.

Keywords: Dietary supplements, anabolic androgenic steroids, abuse, renal function, hematological parameters, toxicological urinalysis.

1. Introduction

Performance enhancing substances (PES) are substances commonly used by athletes to improve the athletic performance or physical appearance. The anabolic-androgenic steroids (AAS) are the most frequently studied PES (Dodge and Jaccard, 2006). Bodybuilders are a group of elite athletes that have been using steroids during the last five decades to increase muscle mass and to intensify training regimens (Yesalis and Bahrke, 1995). However, the abuse of steroids is not only intended to improve physical performance, but it is also related to stress compensation. In some cases, such abuse of steroids is purely aimed for an aesthetic appeal to reach a feeling of wellness in some users (Bahrke et al., 2000; Dodge and Jaccard, 2006).

The consumption of AAS has become an alarming trend among adolescents and young adults and can be considered a public health problem since the actual number of users is greater than indicated by the statistics (Daher et al., 2009). In a recent study review the use of AAS in adolescents and young male adults were ranging from 4% to 6% (Yesalis and Bahrke, 1995; Nilsson, 1995) while for females the estimative ranged from 0.2 to 2.9%

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