



H171 Generalized Organomegaly and the Use of Performance-Enhancing Substances Identified Following Sudden Death

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Learning Overview: The goal of this presentation is to highlight the death of a 43-year-old Caucasian male due to hypertensive and atherosclerotic cardiovascular disease, in which the use of body-building enhancers was a significant contributing factor.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by illustrating the potential effect of anabolic steroids on organ structure and how these changes can lead to organomegaly and cardiovascular damage.

Introduction: Performance-enhancing drugs are pharmacologic agents that professional and recreational athletes use to improve competitive performance or physical appearance. These drugs include anabolic-androgenic steroids, human growth hormone, and blood boosters such as erythropoietin.¹ There are significant gaps in scientific knowledge regarding the adverse health effects of performance-enhancing drugs. Anabolic-androgenic steroids have been associated with increased systolic and diastolic blood pressure, left ventricular hypertrophy, cardiomegaly, and acute myocardial infarction.^{2,3} There is evidence that mortality is significantly increased in steroid abusers over non-abusing athletes.² Case reports typically feature a male poly-drug user with drug toxicity being the most common cause of death and extensive cardiovascular disease being a notable feature.⁴ Per this study's research, this is the first case report linking generalized organomegaly with use of performance-enhancing drugs.

Materials and Methods: This case involved a well-developed (6 feet 4 inches, 252 pounds), trim, muscular 43-year-old Caucasian male who collapsed suddenly while exercising on a treadmill. He had been complaining of headaches with facial reddening over the weeks before death. He was known to use body-enhancing substances.

Results: Postmortem examination revealed generalized organomegaly and extensive cardiovascular disease. The pancreas was uniformly markedly enlarged and weighed 450 grams. The kidneys weighed more than 300 grams each, the liver weighed 3,350 grams, and the spleen weighed 450 grams. The decedent was found to have cardiac hypertrophy (630 grams), concentric left ventricular hypertrophy (2.1cm), and right ventricular hypertrophy (0.6cm). There was atherosclerosis with slight (50%) multifocal luminal impingement in the basilar artery and Circle of Willis arteries, as well as marked three-vessel coronary artery atherosclerotic stenosis (75%–95%). Further examination revealed a remote myocardial infarct in the left lateral ventricular wall (3cm x 3cm x 2.1cm), and an adjacent recent myocardial infarct in the posterior lateral left ventricular wall (5cm x 3cm x 2.1 cm).

Discussion: Generalized organomegaly could be an adverse effect caused by body-enhancing substances and warrants further investigation in future studies. The potential dangers of performance-enhancing drugs are likely underreported because anabolic-androgenic steroids are not routinely screened during autopsy, as testing for performance-enhancing substances can be difficult and expensive.¹ In addition, it is often difficult to obtain a complete and accurate history regarding the use of these substances. This case emphasizes the need for further investigation regarding the prevalence of performance-enhancing drug use and the mechanisms by which these drugs cause adverse effects.

Reference(s):

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Body-Building Enhancers, Organomegaly, Anabolic Steroids