Anabolic steroids: lots of muscle in the short-term, potentially devastating health consequences in the long-term

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Why do people use anabolic steroids? Most researchers and health professionals with an interest in this area could tell you, correctly, that the answer is increasingly "to be more muscular and attractive" rather than "to compete better in my sport" or "to do my job better" [1]. Embedded within this motivation, however, is a rarely acknowledged fact that has implications for researchers, health professionals and the public: Steroids are extremely effective at building large amounts of muscle in a very short amount of time [2]. In contrast, the most significant health consequences of steroid use, including a two-fold increase in mortality due to cardiovascular causes [3], appear only in the long-term, many years after the commencement of use. Acknowledgement and understanding of the effectiveness of steroids is important for remedying users' perceptions that health professionals "don't know" anything about steroids, improving aetiological models of steroid use, and for improving prevention and treatment efforts.

To fully appreciate just how effective steroids are at building muscle, one should turn to the research of Shalendar Bhasin, the world's foremost authority on the effects of exogenous testosterone (steroids) on male body composition. In one study [2], 35 young men were randomised to one of five groups to receive weekly injections of testosterone enanthate – a commonly used steroid – in amounts that varied from 25 to 600 mg per week. After 20 weeks, the men who received 600 mg per week had gained, on average, 8 kg of muscle, and lost, on average, 1 kg of body fat. These figures are impressive enough, but the real eye-opener is that the men were instructed *not* to participate in strength-training or endurance exercise during the course of the study. Essentially, these results could have been achieved while sitting on the couch. Moreover, 600 mg of testosterone enanthate per week is the amount used by most *beginner* or *first-time* steroid-users [1]. Experienced users frequently

report injecting in excess of 1000 mg of testosterone enanthate per week [4]. In another study [5], Bhasin randomised men to one of four conditions: 600 mg of testosterone enanthate and no exercise, 600 mg of testosterone and standardised exercise, placebo and no exercise, and placebo and standardised exercise. At 10 weeks, the men given 600 mg of testosterone enanthate who did *not* exercise had put on more muscle mass than the men who were not on testosterone steroids and who *did* exercise. The implications of this research are hard to ignore: other things being equal, a person cannot out-train, out-diet or outperform steroids.

In contrast, the most significant health consequences of steroid use appear only in the long term. Users have twice the cardiovascular morbidity and mortality rate of non-users [3] and damage to the neuroendocrine system may lead to infertility and lifelong dependence on testosterone replacement therapy [6]. High doses of steroids may also be neurotoxic [7], ominously suggesting that steroid use carries the potential for brain damage later in life. To this end, a recent study found large cognitive deficits in the visuospatial memory of chronic steroid users compared with non-users [8].

Why, however, is it important to acknowledge the exceptional effectiveness of steroids for building muscle in the short-term? Surely we should be focusing on the impairment associated with steroid use, not the so-called 'benefits', risking appearing to sanction their continued use? Undeniably it is true that we need to help clients and the public understand the harm associated with steroid use. However, understanding the science behind steroid efficacy is also critical for those researchers, health professionals and policy makers who aim to prevent or treat steroid abuse. For starters, steroid use, like all illicit drug use, exists in a social context [9], and understanding steroid efficacy helps us to understand the allure of steroids. It helps to explain how steroid use can propagate through groups of boys who attend

the gym together, wherein a steroid-using peer is able to achieve results that his non-using peers simply cannot hope to emulate. It helps to explain the psychology of some first-time users, who profess that they will use only for the short-term, that they can do "just one cycle" of steroids, and then "hold-on" to the body they have achieved [10]. It helps to explain why many steroid users are so reluctant to discontinue use and why those who do are prone to relapse and return to use. And it helps to explain the aetiology of anabolic-androgenic steroid dependence, a condition of psychological dependence on the drug that affects approximately one third of steroid users [11]. These contingencies are under-researched and inadequately discussed.

A better understanding of steroid efficacy may help to remedy the widespread perception among steroid users that healthcare professionals "don't know anything" about steroids [1]. Anecdotal reports of steroid users being told by general practitioners or mental health professionals that steroids "simply don't work" are particularly concerning because they signal a lack-of-understanding that compromises the therapeutic relationship and discourages critical discussion about why the individual is using steroids. Steroid users know that steroids work [9]. It is worth remembering that only 30 years has passed since the United States Food and Drug Administration and other influential health and sporting organisations claimed (incorrectly) that anabolic steroids do not enhance athletic performance [11].

In eating disorders prevention and treatment, efforts to discourage the misuse of laxatives and diuretics are facilitated by evidence showing that neither of these drugs reduces calorie absorption, hence neither is conducive to weight loss [13]. In steroids, however, we face a drug with demonstrated efficacy and, as a consequence, a public relations challenge. Empirical discourse on steroids has justifiably focused on the health consequences of

anabolic steroids, a picture that appears increasingly grim. We need, however, to create a new discourse that entails, as a starting point, appropriate acknowledgement of the efficacy of steroid use in achieving its goals. We can then seek to make progress by researching individuals' beliefs about the efficacy of steroid use and how these may contribute to the development and spread of steroid use, by developing interventions that offer a safer alternative to using steroids to build muscle, and by seeking to understand the allure of steroid use in the context of increasing internalisation of the idealised, lean and muscular, male body. The importance of these efforts is underscored by the current landscape of steroid prevention and treatment research, which is underdeveloped and focused predominantly on cheating in sports, or "doping", among athletes [14].

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