

Did he really earn it? An examination of anabolic-androgenic steroid use in sports

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Abstract

Performance-enhancing drug scandals have tarnished the reputation of many professional athletes in a wide variety of sports, from baseball to swimming to cycling. This paper will examine the literature in order to determine the effects of anabolic-androgenic steroids (AAS) on performance and both physical as well as psychological health; the prevalence in both professional and amateur sports; how steroids are used; how they produce their intended effects; and a brief history of doping in sport and relevant organizations created to deal with doping in sport. The literature will be reviewed and used to conclude that anabolic-androgenic steroid use should not be allowed a place in the professional sporting environment. Analysis of this question proves to be increasingly relevant as more players are indicted for illegal use of performance-enhancing drugs, and as the ethics of “cheating” by using PEDs are cited as a reason to keep great athletes from the Hall of Fame.

Keywords: *anabolic steroids, sports, performance-enhancing drugs, doping*

Roger Clemens played for a total of four teams over his 23-year career as a pitcher; accruing 4,672 strikeouts and 354 wins and making him arguably the most dominant pitcher the game of baseball has ever seen (Fantasy Sports Ventures, 2011). At the end of his hall-of-fame-worthy career, Clemens was indicted in the Mitchell Report, a 400+ page report highlighting the rampant use of performance-enhancing drugs (PED) in the game of baseball, which cast his illustrious record in the nasty light of anabolic-androgenic steroid (AAS) use. Abuse of AAS

plagued baseball and many of its players at the end of the 20th century, and even today anabolic steroids are one of the most commonly abused PEDs in many sports. Considering the difficulty of banning these substances, more and more authorities are considering allowing anabolic-androgenic steroid use in sport. This paper will now discuss the reasons why athletes abuse PEDs, what exactly an anabolic-androgenic steroid is, its effects and side effects, an historical account of drug abuse in sport and the prevalence of doping today, and

conclude with the reasons why anabolic steroids do not have a place in the sporting environment.

Colloquially, anabolic-androgenic steroids are known as “anabolic steroids” or even just “steroids”, and their use is often referred to as “doping”. PEDs are used for various purposes and for different reasons depending on the sport. Baseball players use AAS to hit balls farther and to throw balls faster in order to gain a competitive advantage over other players, whereas a bodybuilder might use them for the simple reason of being able to lift heavier weights. Although this paper is concerned with AAS use in sports, AAS abuse is problematic even outside of the sports environment. Some researchers assert that although the media focuses on AAS abuse in sports, the great majority of users are not athletes at all, but rather individuals desiring to become more muscular and more attractive (Kanayama, Hudson, & Pope, 2008).

The World Anti-Doping Agency (WADA) outlaws a number of substances in the sporting environment, most notably stimulants and hormones. Stimulants are often used in cycling, and have led to several deaths in the sport (Catlin, Fitch, & Ljungqvist, 2008). Strychnine, ephedrine, amphetamines and methylphenidate are several examples of stimulants that have historically been abused in sport (for a more complete list of banned stimulants and their effects, see Deventer, Roels, Delbeke, & Van Eenoo, 2011). Steroids are the most abused class of substances that are outlawed by the WADA. Synthetic testosterone, a type of steroid, is detected in the blood through an immunoassay (or urine test), which is administered to every athlete on a regular basis as a requirement to play professional sports (Catlin, Fitch, & Ljungqvist, 2008).

Anabolic-androgenic steroids are a synthesized type of testosterone, a hormone chiefly responsible for muscle development, and are consumed to mimic its effects in the body. They accelerate muscle growth, often to unhealthy extremes. This commonly occurs in conjunction with weight training to speed up tissue repair after damage caused by a workout (National Institute of Drug Abuse, 2011). AAS is often prescribed for therapeutic purposes, and is often used to treat HIV-related muscle wasting and hypogonadal men; however, use without a prescription is against the law and is recognized as cheating in most competitive sporting events (Evans, 2004; National Institute of Drug Abuse, 2011). Men with testosterone blood plasma levels that are below the normal range of 300 to 1000 ng/dl are those who would typically be treated with anabolic steroids (Evans, 2004).

Side effects of steroid abuse include extreme acne, increases in low-density lipoprotein (LDL, or “bad” cholesterol), which leads to elevated blood pressure and related heart problems, and shrinking of the testes in males along with a decreased sperm count and possibly even infertility (National Institute of Drug Abuse, 2011; Grace, Sculthorpe, Baker, & Davies, 2003). Additionally, injuries associated with rapid muscle gain and slow bone growth are often reported, such as muscle tears and bone fractures (see Stannard & Bucknell, 1993). In fact, after reviewing the relevant literature on steroid use and infertility, de Souza and Hallak (2010) strongly recommend that AAS use be avoided based on the fact that the negative effects on fertility are so severe. Lumia and McGinnis (2010) found similar effects of testosterone on rats, along with an increase in aggressive behaviour as well. It is well known that use of AAS is also associated with mood swings,

often referred to as “roid rage.” It is interesting to note that environmental influences seem to play a disproportionately large role in how “roid rage” is expressed. It is well documented that hormones alter our perceptions of social cues and others’ intentions, and as a result it is not simply high levels of androgens that cause increased aggression, but rather the environment in which they are in effect (Lumia & McGinnis, 2010). This is important to consider in the aggressive environment of sports, and compounds the problems of injury and aggression during games when AAS drugs are abused. Additionally, it is important when considering the place that PEDs have in the sporting environment at the end of this paper.

In addition to these relatively short-term side effects of steroid use, steroid use by younger athletes has developmental consequences, leading to stunted growth, an increased tendency towards aggression and altered serotonin levels in the brain (National Institute of Drug Abuse, 2011; Lumia & McGinnis, 2010). Additionally, cardiac problems associated with use of these drugs often continue to persist well into adulthood (Kanayama, Hudson, & Pope, 2008). Furthermore, long-term health consequences such as renal disorders and prolonged changes in brain chemistry leading to psychiatric disorders are associated with extended use of AAS (Deshmukh, Petroczi, Barker, Szekely, Hussain, & Naughton, 2010; Kailanto, Kankaapaa, & Seppala, 2011).

It is worth noting that although AAS abuse is highly dangerous, there are other PEDs that may have a legitimate place in sport. Some types of PEDs, such as Human Growth Hormone (HGH), are often used to speed up recovery after a sports injury. Although HGH is not the focus of this article,

it should be noted that the WADA still outlaws HGH in most sporting environments, and the effects of HGH in the sporting environment are a hotly contested issue and are far from conclusive (see USA Today, 2009). Many advocate for controlled use of this substance to speed up recovery from injury, although its potential for abuse still needs to be explored (for more information on HGH and sport, see Saugy, Robinson, Saudan, Baume, Avois, & Mangin, 2006).

Historically, substance use and abuse in sport goes back as far as the first Olympic Games in Athens, when athletes would use alcohol, bull’s blood and mushrooms to enhance athletic ability (Kamber, 2011). Even in these times, use of substances such as these was banned, even though it would not become a major concern until anabolic substances were produced in large quantities after World War II (Kamber, 2011). As far back as the 1960s, athletes in Germany were facing governmental pressure into taking extremely high doses of anabolic steroids (Savulescu, Foddy, & Clayton, 2004). A doping scandal at the 1988 Seoul Olympics produced the 1990 Dubin Report, investigating steroid and other PED use in Canadian sports (Kamber, 2011). Anabolic steroid use by baseball players in North America during the 1990s and early 2000s was revealed by the Mitchell Report, an investigation of the practice of doping in the MLB (Major League of Baseball). This report drew considerable media attention to the problem of doping in baseball, and indeed sports in general. Unfortunately, this scandal tarnished the reputation of several legendary players like Clemens. After this scandal, more reports on doping practices emerged in other countries, and eventually another major scandal of PED abuse in the 1998 Tour de France triggered the International Olympic

Committee (IOC) to form the WADA, one of the first international-level anti-doping agencies. The formation of the WADA made fighting PED abuse in sport an international initiative for the first time, and was a huge step towards promoting fairness in the sports environment. The WADA still exists today, and is still fighting against the use of PEDs in sport.

How effective is the fight against doping in the sports environment? Gradidge, Coopoo and Constantinou (2011) found the prevalence of AAS use among high school athletes to be 4%, most of them citing that they used it because they felt it gave them a performance advantage. Sports at the high school level can be a stressful and highly competitive environment. Many students depend on sporting scholarships to finance post-secondary education, creating immense pressure to excel in students who are already under plenty of stress. In turn, this stress can foster a desire to use anabolic steroids, and use of AAS creates problems in normal developmental processes (See Lumia & McGinnis, 2010 for complete information on developmental problems associated with anabolic steroid use and puberty). Lorang et al. (2011) revealed a smaller proportion of high school students in the United States (1.4%) used anabolic steroids, but nevertheless found that some athletes practiced doping at a young age. Additionally, between 1 and 3 million people in the United States are thought to have misused AAS at some point in their life (Sjoqvist, Garle, & Rane, 2008; de Souza & Hallak, 2010). These numbers are certainly striking, and highlight the fact that doping is indeed an issue. Unfortunately, it is difficult to determine the prevalence of doping in the current professional sports environment, as athletes who are still active in the sport and using AAS are doing so illegally and thus will

not disclose such information. Athletes may try many methods to avoid detection of their steroid abuse, such as urine switching or the use of diuretics. It should be noted, however, that diuretics are also on the list of WADA banned substances, in part for this very reason (Cadwallader, de la Torre, Tieri, & Botre, 2010).

Why is it so important that doping in sport be eradicated? This is a question that many athletes and spectators ask in an effort to understand just how PED use in sport is damaging. Firstly, AAS use is physiologically damaging. As discussed earlier, the high levels of anabolic steroids that are often used by those abusing the substance (oftentimes 10 to 100 times higher than that which would be used for therapeutic purposes) cause many adverse side effects, most notably increased aggression and decreased fertility along with many cosmetic changes (National Institute of Drug Abuse, 2011). Secondly, the issue of fair play in sport is important to consider, as those who “cheat” by taking PEDs without putting in as much work as those who are “clean” is considered by most to be unfair. In relation to this, Solberg and Ringer (2011) note that that baseball culture is a unique case in that the culture promotes unfairness. Cheating is more accepted in baseball than in other sports, made evident by the fact that stealing signs, corking bats, and throwing “spitballs,” have historically been part of the game. It may be this attitude that contributed to the steroid abuse scandal of the 1990’s, and the higher proportion of baseball players that abuse AAS compared to other sports (Solberg & Ringer, 2011). This attitude continues to pose problems for those trying to eradicate abuse of AAS in baseball.

From a psychological point of view, AAS use has compounding effects within a sport.

For instance, when it is learned by one athlete that another player competing for either wins or their spot on the team is using PEDs, it becomes a perceived necessity to abuse substances as well. A survey conducted by Dr. Bob Goldman highlights the power of competition in relation to doping behavior. In this survey, respondents were asked if they would take a substance that would cause them to remain unbeaten for five years, but would subsequently be the cause of their death. Over 50% of respondents said they would take the substance (Bird & Wagner, 1997). The intense effects of competition on drug abuse becomes an especially important point to consider when this paper discusses the effect that a perceived disadvantage can have on a player (Stirin, Ganzach, Pazy and Eden, 2012). The powerfully compelling psychology behind competition probably fueled the baseball PED scandal of the late 20th century even further, and continues to make implementing successful anti-doping measure difficult.

It has long been suggested that AAS use should simply be given a place in sport. Anti-doping measures cost national anti-doping agencies millions of dollars each year, and some believe them to be a waste of resources (World Anti-Doping Agency, 2006). The argument for legalizing any PED stems from eliminating these costs, and from the fact that if they were legal, everyone would use them and there would no longer be any unfair advantage. However, looking at the damaging effects that long-term use of AAS has on the athlete, it is ethically difficult to give substances like AAS a place in sport, especially when the high levels of aggression that are already present in competitive sporting environments are considered. Even though much time and money could be

saved by not having to test for the presence of anabolic steroids, it is hard to imagine children growing up and idolizing a competitor for their athletic prowess knowing that they did not earn it through hard work.

Research conducted by Stirin et al. (2012) underscores the psychological effects of a few athletes doping versus standardized doping. Their experiment examined how perceived disadvantage in a competitive situation affects performance, and revealed evidence that a perceived advantage (for instance, by taking steroids) in itself can give a performance enhancement, while a perceived disadvantage decreases performance. Therefore, it seems that if all athletes are taking steroids these effects might disappear. In fact, it is possible that as performance becomes attributed to a highly externalized source (the drug), the widespread use of these drugs may operate to wash out any natural ability differences that each athlete might perceive (i.e., they would assume that because each competitor is on the same drug, they will perform roughly the same), which might diminish incentives to prepare for competition. This research suggests that when AAS use is standardized among all players, there are diminishing returns on performance for identical risks to health.

Some researchers believe that PED use should be standardized across specific sports, or at least monitored in a different way. In one article, Savulescu, Foddy and Clayton (2004) explain why legalizing most hormonal PEDs and instead monitoring the hormone levels in the body would level the playing field, save time and money on detection, and still ensure a safe, competitive environment for all athletes. Levels of both natural and synthetic hormones in the body (for example, HGH)

could be measured and as long as they do not breach a certain threshold the athlete will be allowed to compete. This allows for athletes to use therapeutic hormones while still competing, or to correct for natural deficiencies in these hormones that would otherwise make performing at a competitive level impossible. Although the authors raise some very good points, it is still important to note that they do not recommend that anabolic steroids specifically become legalized, as anabolic steroids are in themselves harmful, whereas many PEDs (like HGH) are not (Savulescu et al., 2004).

Competitive sport has been plagued since its origin by a history of drug abuse in order to obtain an unfair advantage. Anabolic-androgenic steroid use is perhaps the most problematic, and historically it has been a huge problem in the world of professional baseball, where a “cheating positive” atmosphere and the need for larger muscles create a great incentive to abuse the drug. Although some argue that AAS use in sport should be legalized to save money and remove the problem of fair play, this conclusion would be ignorant of the damaging effects that anabolic-androgenic steroids have on the body and of the psychological effects surrounding competitive advantage and drug abuse. Additionally, sport has a responsibility to set an example for those spectators who draw inspiration from their favourite pitcher or quarterback. Sport needs to send the message that hard work and determination - and not a drug - are the most important tools for success. Although some performance-enhancing drugs may be legalized in the near future, the effects, history, and prevalence of anabolic steroids reviewed in this article clearly suggest that the standardized use of AAS should still be vehemently protested. New detection

techniques are constantly in development to try and stop AAS use, and future research should focus on new technology in this area as well as investigating how often athletes turn to other, legal competitive advantages like psychological skills training. Awareness of these skills could deter athletes from abusing PEDs. Anabolic-androgenic steroid use in sports today pulls dominant records held by legends like Roger Clemens into question, and makes us ask ourselves: “Did he really earn it?”

Declaration of Conflicting Interests

The author declared they have no conflicts of interests with respect to their authorship or the publication of this article.

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