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Aggression and body image concerns among anabolic androgenic steroid users, contemplators, and controls in Norway

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ABSTRACT

AAS users and contemplators were investigated for differences in aggression and body image concern. Prevalence rates were sought as a secondary aim. 396 male adolescents at Norwegian high schools completed a questionnaire battery during school hours. Prevalence of AAS use showed 4.0%; AAS contemplation showed 5.1%. No significant differences between the AAS users and contemplators were found on levels of aggression and body image concern. AAS users and contemplators reported significantly higher levels of aggression and body image concern compared nonusing controls. AAS contemplators enhance understanding of AAS use by representing psychosocial factors contributing to increased aggression, and AAS use or risk thereof indicative of an aggressive personality profile. Body image concerns for AAS users and contemplators may indicate that AAS use does not diminish body image concern, and that body image concern is a risk factor for AAS use. This is supportive of previous research.

Introduction

An anabolic androgenic steroid (AAS) is an umbrella term for several synthetic derivatives and structural modifications of testosterone, varying in chemical composition and anabolic to androgenic ratio (Kuhn, 2002). It is the anabolic effect that is attractive for AAS users as it increases lean muscle mass and reduces body fat (Wood, 2004). Physical side effects of AAS use include coronary heart decease, testicular atrophy, sterility, and gynecomastia (Bahrke, Yesalis, & Brower, 1998; Torres-Calleja, González-Unzaga, DeCelis-Carrillo, Calzada-Sánchez, & Pedrón, 2001). Psychological side effects are linked to increased irritability and aggression (Perry et al., 2003; Pope, Kouri, & Hudson, 2000), increased risk of affective disorders, psychotic disorders, suicidality (Bahrke et al., 1998), and body dissatisfaction (Olivardia, Pope, Borowiecki, & Cohane, 2004). In addition, a number of side effects have been associated with the discontinuation of AAS use, such as reduced muscle size, depression, and male hypogonadism (Tan & Scally, 2009; Wood, 2004). The typical pattern of AAS use follows a method termed 'cycling'. This involves using steroids in intervals, where the cycle gradually increases in dose of AAS, then tapers the dose towards the end of the cycle (Brower, 2002). Most users also 'stack' AAS, a method involving the combination of several oral and injectable AAS to augment beneficial effects and reduce adverse effects (Wood, 2004). The AAS cocktail typically follows a pattern named 'pyramiding', where the various AASs increase and decrease on a weekly basis (Wood, 2004). This pattern of polypharmacy has been reported in up to 90% of AAS users (Evans, 1997). Some of the concomitant drugs may result in medical emergencies on their own, possibly being more dangerous than the AAS by itself (Evans, 2004). The amount of AAS concentration circulating in the body during a cycle, have been reported to reach a hundred times the physiological range of a typical adult male (Evans, 2004), with doses reaching up to a hundred times more than for medical prescriptions (Brower, 2002). The exact concentration of AAS in the body is difficult to establish, however, due to use of veterinary preparations and false content labels in the manufacturing of AAS for recreational use (O'Sullivan, Kennedy, & Casey, 2000). Overall, there are individuals that either unknowingly or consciously defies potentially lethal side effects when initiating and continuing AAS use. As such, investigating the underlying reasons for AAS use is of utter importance.

Several studies have shown that steroid use is often initiated during adolescence (Faigenbaum, Zaichkowsky, Gardner, & Micheli, 1998; Yesalis, Kennedy, Kopstein, & Bahrke, 1993). Prevalence rates of AAS use in American male high-school students is approximately 3.3% (Centers for Disease Control, 2010) whereas Scandinavian prevalence rates lie between 1.2% and 2.9% (Barland & Tangen,

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2009; Wichstrøm & Pedersen, 2001). Kanayama, Pope, and Hudson (2001) point to the importance of examining prevalence of AAS use internationally. As female AAS use is relatively rare in the general population (Kanayama, Boynes, Hudson, Field, & Pope, 2007), the current study will investigate the prevalence rate of adolescent male students in Norway. Due to the recent aetiology of this research field, relatively few studies have examined the status of at-risk male adolescents for AAS use (Cafri et al., 2005; Pope, Kanayama, & Hudson, 2012). Thus, the current study will also investigate the prevalence rate of adolescents contemplating AAS use.

AAS have traditionally been associated with the field of professional sports, where it has been used with the intent to enhance athletes' performance levels (Wichstrøm & Pedersen, 2001). In the past decades, however, AAS use has emigrated from the field of organised sports to become an increasing public health problem (Kanayama, Hudson, & Pope, 2008). Indeed, Brower (1989) identifies three types of AAS users; the athlete, the aesthete, and the fighting elite. While the athletes use AAS to enhance sports performances, the aesthetes use AAS to enhance physical appearance, and the fighting elite is argued to use AAS to enhance fighting potential (Brower, 1989). In this study, these three types of AAS users will provide a useful framework for the investigation of AAS use.

Many studies have focused on the athlete type AAS user (Burnett & Kleimann, 1994), and according to Miller, Barnes, Sabo, Melnick, and Farrel (2002), wrongfully so. They argue that with the spread of AAS beyond the field of organised sports, a continuation of a research field favouring this perspective will limit other perspectives. The current study will therefore focus on Brower's (1989) aesthete type and fighting elite type AAS user.

Some research argues that AAS use is primarily predicted by problem behaviour (Wichstrøm & Pedersen, 2001). Miller, Hoffmann, Sabo, Melnick, and Farrel (2010) found that substance abuse, fighting and risky sexual behaviour were better predictors of AAS use compared to athletic involvement. Other studies have found a link between aggression and AAS use. For instance, laboratory studies have found increased aggressive responses for rats (Wood et al., 2013) and males (Pope et al., 2000) after testosterone supplementation. Research has also showed that adolescent AAS contemplators tend to be more aggressive than nonusers (Elliot & Goldberg, 1996). The current study will therefore examine aggression levels for AAS using and AAS contemplating adolescents compared to a healthy nonusing group of adolescents. This shall be investigated in the light of the Risk Behaviour Syndrome (RBS; Jessor & Jessor, 1977). Middleman, Faulkner, Woods, Emans, and DuRant (1995) portray this syndrome as a clustering of adolescent intraindividual covariation of risk and problem behaviours. Problem behaviours are behaviours condemned by society (Jessor & Jessor, 1977), and seeing that AAS use is illegal in many countries, one may argue that AAS use has common factors with other illegal drugs.

Research investigating body image concerns has found that body dissatisfaction poses as a risk factor for adolescent AAS use (Blouin & Goldfield, 1995; Pope et al., 2012). Evans (1997) found that two thirds of recreational body builders used AAS to enhance their physical appearance rather than enhancing sports performances. Further, Brower, Blow, Young, and Hill (1991) found that dependent AAS use was best predicted by dose of administered AAS and dissatisfaction with body size. This was also shown in another study, where long-term users showed significantly higher levels of body dissatisfaction, to the point of reaching clinical levels of muscle dysmorphia (Cafri et al., 2005). Other studies have found a link between AAS use and body image concern in adolescent samples (Blouin & Goldfield, 1995; Komoroski & Rickert, 1992). Smolak, Murnen, and Thompson (2005) found that middle and high school boys who reported muscle or unspecified body dissatisfaction were more likely to initiate use of AAS and other food supplements. Further, the percentage of adolescent boys worrying about body image has been found to reach the same level as bodily dissatisfied adolescent girls (Ricciardelli & McCabe, 2007). In a society where pressure from media and peers to obtain a mesomorphic body shape play a contributory part to body dissatisfaction and drive for muscularity (Daniel & Bridges, 2010; Hardit & Hannum, 2012), it is likely that investigating male body image as it relates to AAS users and potential users is highly relevant. As such, the current study finds it important to investigate AAS using and AAS contemplating adolescents on the measure of body image concern. This will be examined through Brower's (2002) two-stage model of AAS dependence.

Brower's model (2002) attempts to account for the particularities of AAS use as it differs and relates to other drug dependencies. He argues that AAS dependence does not conform to the typical pattern of drug addiction where drug use is maintained and increased for their euphoric effects. AAS are, rather, cumulative action substances giving a delayed effect of muscle gain (Kanayama, Brower, Wood, Hudson, & Pope, 2009). It develops from a sociocultural context where individuals, with various agendas, seek a larger muscle mass and a mesomorphic body type (Mishkind, Rodin, Silberstein, & Striegel-Moore, 1986). This constitutes the first stage of Brower's (2002) model, and is also known as 'the body image mechanism' of AAS dependence (Kanayama, Brower, Wood, Hudson, & Pope, 2010). At this stage, individuals exercise more frequently and with high intensity, often following a strict diet to obtain the desired muscle gain. It is this very goal-directedness of the weight training that is the most discernible difference from other drug addictions, and Brower (2002) argues that the reinforcing elements of AAS use are the anabolic effects. In stage two of Brower's (2002) model, AAS users have self-administered AAS at supraphysiologic doses for a substantial amount of time, thus enabling the activation of the brain's reward system. As such, AAS dependence at stage two conforms more to classical drug dependence conforming to the positively reinforcing hedonic effects. This hedonic route to AAS dependence is argued to be a subset of the body image mechanism, as there are no reported cases of AAS dependence without stage one's goal-oriented weight training and its body building effects (Brower, 2002). The focus of the present study is that of Brower's (2002) stage one of model of AAS dependence, as it is argued to be the most relevant for a nonclinical group of adolescents.

In summary, this study will investigate self-reported levels of aggression and body image concern relating to AAS use and contemplation in a sample of adolescent male students. The current study also seeks to investigate prevalence rates for AAS use and contemplation in a sample of adolescent male students in Norway.

Method

Participants

The present study consists of 414 male adolescents from six upper secondary schools in the region of Oslo, Norway. Eighteen (4.3%) respondents were excluded from the analyses due to incompletion of the questionnaire battery. The remaining 396 participants had a mean age of 16.8 years ($SD = 1.02$), ranging from 16 to 21 years. The schools were selected on basis of geographical location, to minimise local idiosyncrasies and control for socioeconomic status. The first author approached the school management through telephone and letter, and the school management gave consent to initiate study. Six out of eight approached schools gave consent to partake in the study, giving a response rate of 75%.