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Sexual Risk Behaviors and Steroid Use among Sexual Minority Adolescent Boys

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Abstract

Background—Previous research has extensively examined the relationship between the use of alcohol and illicit substances with sexual risk behaviors among sexual minority (i.e., gay and bisexual) male youth; however, no known studies have assessed the association of steroid use to risk behaviors among this population.

Methods—Participants were 556 sexually active sexual minority adolescent boys (M age = 16.2, SD = 1.3), taken from a pooled dataset of the 14 jurisdictions from the 2005 and 2007 Youth Risk Behavior Surveys that assessed sexual orientation. The association between lifetime use of steroids and sexual risk behaviors were examined.

Results—Controlling for number of sexual partners, depression, victimization, and race, boys who reported increased steroid use were at increased odds of engaging in condomless sex, $OR = 1.55$, $p = .003$, and use of alcohol/drugs during sex, $OR = 1.48$, $p = .002$.

Conclusions—Steroid use among sexual minority adolescent boys is prevalent and associated with HIV/STI sexual transmission risk behaviors.

Keywords

Sexual risk; Adolescent boys; Steroids; Sexual orientation; Substance use

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Conflict of Interest

Authors declare no conflict of interest.

Contributors

Author A.J.B. was responsible for the design of the study, conducting of statistical analyses, and drafting the introduction, results, and discussion. Author J.D.J. was responsible for drafting the methods section. Author S.A.S. provided editorial comments on all aspects of the manuscript. All authors have read and approve of the submission of this manuscript to *Drug and Alcohol Dependence*.

1. INTRODUCTION

Sexual minority (i.e., gay and bisexual) male youth represent an identified at risk group for acquiring HIV (Hall et al., 2008), and had the greatest increase in HIV infections from 2008 to 2010, compared to all other age groups (CDC, 2012). A number of factors may explain this disparity, including worse mental health and substance use (Garofalo et al., 1998; Mustanski et al., 2007). Although alcohol and illicit substances have routinely been examined as predictors of sexual risk behaviors (e.g., condomless sex) among sexual minority youth (Mustanski et al., 2007; Rosario et al., 2006) few, if any, studies have explored sexual risk with anabolic androgenic steroid use.

Anabolic androgenic steroids (AAS; e.g., testosterone or synthetically derived testosterone), support protein synthesis and the development of secondary male sex characteristics (Pope and Brower, 2009) and are often initiated to enhance physical appearance (Ip et al., 2011). Substantial sexual orientation health disparities exist in regard to the prevalence of AAS use, with sexual minority boys reporting a lifetime rate of 21% compared to 4% for heterosexual adolescent boys, in 2005–2007 (Blashill and Safren, 2014), over a 5 fold difference. Further, AAS use has been associated with increased sexual risk behaviors among heterosexual males (Blashill et al., 2014; Miller et al., 2002); however, to date, there have been no known studies that have examined AAS use and sexual risk behaviors among sexual minority male youth, one of the most vulnerable groups for acquiring HIV.

Misuse of AAS confers maladaptive health outcomes (e.g., Pope et al., 2014) and also is associated with other forms of substance use (Irving et al., 2002; Miller et al., 2005). Depression and victimization are strong predictors of sexual risk behaviors for sexual minority males, and also covary with steroid use (e.g., Blashill et al., 2014; Blashill and Safren, 2014; Colfax et al., 2004; Koblin et al., 2006); thus, it is important to assess if steroid use exerts an effect on sexual risk behaviors, over and above these known risk factors. Consequently, the aim of the current study was to test the relationship between steroid use and sexual risk behaviors (e.g., condomless sex, alcohol/drug use during sex) among a nationally distributed sample of sexual minority adolescent boys. We hypothesized that steroid use would significantly predict increased sexual risk behaviors, controlling for number of sexual partners, depression, victimization, and race.

2. METHODS

2.1 Participants and Procedures

Participants were 556 sexually active sexual minority adolescent boys. The study analyzed a dataset that pooled 2005 and 2007 Youth Risk Behavior Surveys (YRBS; CDC, 2004; Mustanski et al., 2014) from 14 jurisdictions (Boston, Chicago, Connecticut, Delaware, Hawaii, Maine, Massachusetts, New York City, San Diego, San Francisco, Vermont, Rhode Island, Wisconsin, and Milwaukee) as these were the only jurisdiction in the U.S. that included 1 or more measures of sexual orientation. The general approach to pooling the data and analyzing the pooled dataset, along with the sexual orientation items and characteristics of the sample by jurisdiction, are described in detail in Mustanski et al. (2014).

2.2 Measures

2.2.1 Sexual orientation—Nine of 14 jurisdictions included a question about sexual orientation identity. In the most common variation (1a), students were asked “Which of the following best describes you?” Response options included “Heterosexual (straight),” “Gay or lesbian,” “Bisexual,” and “Not sure.” Variation 1b was identical to 1a except that the second response option read, “Homosexual (gay or lesbian).” Variation 1c was identical to 1a except the additional response option “None of the above” was included. These variations were pooled into a single sexual orientation identity variable (see below), with respondents who checked “none of the above” in Variation 1c set to missing.

Twelve of 14 jurisdictions included a question about the gender of sexual partners. In the most common variation (1a), students were asked “During your life, with whom have you had sexual contact?” Response options included: “I have never had sexual contact,” “Females,” “Males,” and “Females and males.” A similar variation (1b) asked: “During your life, the person(s) with whom you have had sexual contact is (are)...” and options were “I have not had sexual contact with anyone,” “Female(s),” “Male(s),” and “Female(s) and male(s).” Variation 1c included the same response options in the singular, but asked, “The person(s) with whom you have had sexual contact during your life is (are).” In several jurisdictions, students were asked about sexual intercourse rather than sexual contact. In this variation (2), students were asked “During your life, with whom have you had sexual intercourse?” Options included “I have never had sexual intercourse,” “Females,” “Males,” “Females and males.” Using these questions and the sex of respondents, we created the following categories: no reported sexual partners, exclusive same sex sexual partners, same and opposite sex sexual partners, and exclusive opposite sex partners.

Attraction was measured in only one jurisdiction with the item (Variation 1), “Who are you sexually attracted to?” Response options included “Males,” “Females,” “Both males and females,” and “I am not sexually attracted to anyone.” Using these questions and the sex of respondents, we created the following categories: attracted to opposite sex, attracted to same sex, bisexually attracted, not attracted to anyone.

A pooled sexual orientation variable was created that allows for inclusion of as many jurisdictions as possible in the analysis sample. Thus, we included individuals who endorsed a minority sexual orientation on any of the three dimensions measured (“gay or lesbian” or “bisexual” in Sexual Orientation Identity, “exclusive same sex” or “same and opposite sex” in Gender of Sexual Partners, and “attracted to same sex” or “bisexually attracted” in Gender of Sexual Attraction). This approach allowed us to use the entire sample to report data on the overall population of sexual minority adolescent boys, and this has been done in prior studies with this dataset (Blashill and Safren, 2014; Mustanski et al., 2014).

2.2.2 Steroid use—Lifetime steroid use was assessed with the following item, “During your life, how many times have you taken steroid pills or shots without a doctor’s prescription?” Participants responded to a 6-point scale that ranged from “0 times,” to “40 or more times.”

2.2.3 Depressive symptoms/Suicidality—Symptoms of depression and suicidality were assessed via 4 individual items, which included feeling sad or hopeless nearly every day for a 2 week period, as well as items assessing suicidal ideation, plans, and attempts over the previous 12 months. All but the latter item (regarding suicide attempts) were responded to via yes/no. The suicide attempts item was dichotomized into “none/ 1 or more”, and a total depression score was calculated on the sum of the 4 individual items (as has been done in prior research; Blashill and Safren, 2014), resulting in a possible range of scores of 0 to 4, with higher scores denoting increased depressive symptoms/suicidality. Scale score reliability for the current sample was adequate ($KR\ 20 = .70$).

2.2.4 Victimization—Victimization was assessed via 6 individual items, which included feeling unsafe, being threatened, having property stolen, and getting into fights at school, along with items that assessed fights and injuries from fights outside of school. Because questions used different response scales, z scores were calculated for each item and a composite score was created to obtain a global victimization score, with higher scores denoting greater victimization. Scale score reliability for the current sample was good ($\alpha = .89$).

2.2.5 Sexual risk behaviors—Condom use was assessed with the following item: “The last time you had sexual intercourse, did you or your partner use a condom?” Responses were coded 1 for “no” and 0 for “yes.” Participants also were asked: “Did you drink alcohol or use drugs before you had sexual intercourse the last time?” Responses were coded 1 for “yes” and 0 for “no.” Lastly, participants reported the number of sexual partners, assessed via: “During your lifetime, with how many people have you had sexual intercourse?” Response options ranged from 1 “none” to 7 “6 or more.”

2.3 Data analysis

Binary logistic regressions were employed to assess the dichotomous outcomes variables (i.e., condom use, and alcohol/drug use during sex). In these models, main effects of steroid use, number of sexual partners, depression, victimization, and race were entered¹. Adjusted odds ratios (AOR) and their 95% confidence intervals (95% CI) were computed for each parameter. As a metric of goodness of fit, Cox and Snell pseudo R^2 was calculated for each model. Given the complex sampling design inherent to the YRBS administration, the complex samples module of SPSS 21.0 was utilized.

3. RESULTS

3.1 Descriptive analyses

The average age of participants was 16.2 ($SD = 1.3$), and the sample was diverse: White (37%), Black/African American (27%), Hispanic/Latino (15%), Biracial/Hispanic (7%), Asian (6%), Biracial/non Hispanic (4%), Native Hawaiian/Pacific Islander (3%), and American Indian/Alaskan Native (1%).

¹Polysubstance use was considered as a covariate, but given concerns regarding multicollinearity with steroid use (e.g., $r = .80$), it was not retained in models. However, in sensitivity models with polysubstance use and steroid use entered simultaneously, steroid use still emerged as a significant predictor of sexual risk behaviors.

3.2 Condomless sex

The overall logistic regression model was significant, $F_{(5, 123)} = 6.6, p < .001$, and the Cox and Snell pseudo R^2 for the overall model was .12. One parameter emerged significantly, steroid use (AOR = 1.55, 95% CI [1.17, 2.05], $p = .003$). This result indicates that as steroid use increases, as do the odds of engaging in condomless sex.

3.3 Alcohol/drug use during sex

The overall logistic regression model was significant, $F_{(5, 125)} = 20.3, p < .001$, and the Cox and Snell pseudo R^2 for the overall model was .30. Four parameters emerged significantly, steroid use (AOR = 1.48, 95% CI [1.16, 1.90], $p = .002$), depressive symptoms (AOR = 1.30, 95% CI [1.03, 1.65], $p = .027$), number of sexual partners (AOR = 1.35, 95% CI [1.16, 1.59], $p < .001$), and victimization (AOR = 1.86, 95% CI [1.40, 2.47], $p < .001$). These results indicate that as steroid use, depression, number of sexual partners, and victimization increases, as do the odds of consuming alcohol/drugs during sex.

4. DISCUSSION

The current study is the first known examination of steroid use as a risk factor for sexual risk behaviors among sexual minority boys. Results revealed that increased lifetime steroid use was associated with increased odds of condomless sex and alcohol/drug use during last sexual intercourse. Importantly, these effects were significant even after controlling for well-established risk factors. Condomless sex and alcohol/drug use during sex are significant risk factors for acquiring HIV and other sexually transmitted infections (STIs), and thus, sexual minority boys who use steroids are likely at an elevated risk for contracting and transmitting HIV and other STIs.

An obvious next question is *why* does steroid use confer sexual risk for sexual minority adolescent boys? Some potential pathways may include impulsivity, sexual arousal, and (hypo)mania, as males who use steroids report elevated trait level impulsiveness (Galligani et al., 1996) and experimental data indicate that acute steroid use leads to increased sexual arousal (Su et al., 1993), and symptoms of (hypo)mania (Pope et al., 2000). These factors, in turn, are associated with increased sexual risk behaviors (Ariely and Loewenstein, 2006; Malow et al., 2001; Raffaelli and Crockett, 2003). However, it is also important to note that chronic use of steroids may not confer the same effects on sexual arousal (Kim and Wood, 2014), and may be a phenomenon exclusive to acute and/or infrequent users.

The current study is not without limitations. The design was cross sectional, precluding temporal inferences. Although it may be somewhat unlikely that sexual risk behaviors cause steroid use, longitudinal designs are needed to more properly address temporality. The assessment of steroid use also warrants discussion. The wording of the YRBS does not explicitly state “anabolic androgenic” steroids, but rather, simply “steroids.” Due to this wording, it is possible that participants may have inadvertently responded to this item thinking about non AAS, such as glucocorticoids; however, this concern may also be tempered given that within the YRBS, the steroid item is placed alongside other illicit substances (e.g., cocaine, heroin, and MDMA). This pooled YRBS dataset included data

from 2005 and 2007, and the data may not be fully independent, as it is possible that the same participants could have responded in both 2005 and 2007. However, it has been argued that this does not comprise validity, due to such a small percentage of repeat participants (see Mustanski et al., 2014). Finally, the data from the pooled YRBS were sampled from progressive, urban areas, and thus, results may not generalize to rural, or more conservative areas of the U.S.

The results of the current study may impart clinical implications. Given the associations revealed between steroid use and sexual risk behaviors among sexual minority adolescent boys, interventions that aim to decrease HIV/STI sexual transmission risk behaviors may be effectively augmented by incorporating the role that steroid use may play. Although not assessed in the pooled YRBS, body dissatisfaction is one of the strongest predictors of steroid use among males (Ricciardelli and McCabe, 2004), and there is emerging research that elevated body disturbance is also associated with sexual risk behaviors (Blashill et al., 2015; Wilton, 2009) and STIs (Brennan et al., 2012) for sexual minority males. Thus, integrating interventions that address sexual risk within the context of body image and steroid use may be an effective approach to target multiple behavioral outcomes.

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Highlights

- We examined the relationships between steroid use and sexual risk behaviors.
- Participants were sexual minority adolescent boys.
- Increased steroid use predicted increased condomless sex.
- Increased steroid use predicted increased use of drugs/alcohol during sex.