Rate Of Anabolic-Androgenic Steroid Use Among Students In Junior High School

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Background: **Anabolic-androgenic steroid use has become an increasingly large problem. Studies document steroid use in high-school students, but not students in junior high school. We surveyed 7th-grade students to assess rate of use and knowledge about steroids.**

Methods: **Seventh-grade students completed a 22-question survey instrument that addressed previous steroid use, knowledge about the effects of steroids, other previous substance abuse, and demographic data. The one-sided Z test was used for statistical analyses.**

Results: **Of those students who admitted to using steroids, 4.7 percent were male and 3.2 percent were female. Those more likely to have tried steroids included African-Americans ($P < 0.05$), 15-year-olds ($P < 0.05$), football players ($P < 0.025$), wrestlers ($P < 0.005$), and past users of alcohol ($P < 0.005$) or tobacco ($P < 0.005$). There were significant differences between steroid users and nonusers in knowledge about the effects of anabolic-androgenic steroids on the body: steroid users knew less than nonusers.**

Conclusion: **The establishment of steroid use in junior high school should cause physicians to seek signs or history of steroid use, especially in patients who are members of groups more likely to use them. In addition, physicians should initiate dialogue about steroids with patients before they are likely to have tried them. (J Am Board Fam Pract 1993; 6:341-5.)**

Since the 1950s the development and use of anabolic-androgenic steroids have become increasing problems for professional and amateur athletes. Young persons, athletes and nonathletes alike, also are using anabolic-androgenic steroids. Buckley, et al.[1] found that 6 percent of high-school senior boys used steroids, 66 percent of whom started before they were 17 years old. Terney and McLain[2] found a use rate of 4.4 percent in the 3047 students of a 4-year high school and 4.3 percent rate of use in 9th graders. Windsor and Dumitru[3] found a 5 percent use rate in high-school boys and 10.2 percent use in male high-school athletes.

Risks and side effects of anabolic-androgenic steroid use can include premature epiphyseal closure,[1,4-8] testicular atrophy,[5,6,9,10] male pattern baldness,[4-8,10,11] facial hair in female students,[5-7,10-12] breast development in male students,[4,5,7,9,10] and psychologic problems.[4,5,7,8,10,12-14] Such use can also cause a dependence syndrome.[10,14]

Steroids are considered controlled substances in many states,[15] and their use has been condemned by the American College of Sports Medicine[16] and the American Academy of Pediatrics.[17]

Nowhere in the medical literature are estimates of the prevalence of steroid use in junior high-school students discussed. We surveyed 782 male and female 7th-grade students to measure their rate of anabolic-androgenic steroid use and their knowledge about these steroids.

Methods

All 7th-grade students in public schools in Modesto, California, were eligible to participate during the spring of 1991. In this community, junior high schools comprise students in 7th, 8th, and 9th grades. Modesto, an agricultural-industrial town in the central California valley, has a population of approximately 160,000.

Written parental consent was required before students could answer the 22-item questionnaire,* which was administered by the authors during physical education class. Confidentiality was assured, and no identifying information was allowed on the questionnaires. Immediately following

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*Copies of the questionnaire are available from the authors upon request.

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completion of the questionnaire, students were given a brief presentation about anabolic-androgenic steroid use.

Statistical comparisons between segments of the survey population were made using the one-sided Z test.

Results

Of the total 1624 7th-grade students, 810 returned a signed permission slip and completed the questionnaire. Twenty-eight questionnaires were improperly completed and excluded, leaving 782, for a response rate of 48 percent. Forty percent of all male and 57 percent of all female students completed the questionnaire. The racial distribution of our survey sample was similar to that of the entire 7th grade except for a smaller percentage of whites participating in the survey ($P < 0.005$) (Table 1). Sixty-seven students taking the questionnaire did not designate their race. Most participants were aged 12, 13, or 14 years. Eleven participants were 15 years old (Table 2).

Our results indicate that 89 percent of the respondents had "heard of steroids," 19 percent knew "someone who is using steroids or used them in the past," and 18 percent knew where they could buy steroids. Thirty-six percent thought that by taking steroids, they "did not have to exercise or eat well to get big or strong muscles." Thirty-nine percent thought steroids "would help me perform better in sports."

Regarding the harmful effects of anabolic-androgenic steroids, 52 percent thought they "could make males develop breast tissue." Seventy-one percent thought steroids could "cause females to lose breast development." Seventy-one percent responded that some "side effects of steroids can be permanent."

Table 1. Distribution by Race of 7th-Grade Students (n = 1624), Survey Participants (n = 782), and Those Reporting Anabolic-Androgenic Steroid Use (n = 30).

Race	7th Grade No. (%)	Participants No. (%)	Steroid Users No. (%)
Asian	178 (10.4)	99 (12.7)	4 (4.0)
African-American	57 (3.5)	29 (3.7)	3 (10.3)*
Hispanic	519 (32.0)	248 (31.7)	11 (4.4)
White	864 (53.2)	326 (41.7)†	9 (2.8)
Other or undesignated	6 (< 1.0)	80 (10.2)	3 (3.8)

*Association statistically significant at $P < 0.05$.
†Association statistically significant at $P < 0.005$.

Table 2. Age Distribution of Survey Participants (n = 782) and Anabolic-Androgenic Steroid Users (n = 30).

Age in Years	Participants No. (%)	Steroid Users No. (%)
12	221 (28)	5 (2)
13	396 (51)	13 (3)
14	119 (15)	7 (6)
15	11 (1)	2 (18)*
Blank or other	35 (5)	3 (9)

*Association significant at $P < 0.05$.

There were statistically significant differences between responses of male and female students to some statements. More male students (7.4 percent) than female students (3.6 percent) had "someone offer steroids to me in the past" ($P < 0.01$). Sixty percent of the male students and 53 percent of the female students thought "steroids are the easiest way to get strong or big muscles" ($P < 0.025$). Seventy-one percent of the male students and 59 percent of the female students thought steroids could "cause testicles to shrink" ($P < 0.005$). Seventy-eight percent of the female students thought steroids could cause depression, compared with only 73 percent of the male students ($P < 0.05$).

More male students (4.7 percent) than female students (3.2 percent) admitted to using steroids. There was a 3.8 percent rate of use overall, and a relatively equal proportion of students used steroids in each racial group except for African-Americans. The 10 percent rate of use by African-Americans was significantly higher than that of the other racial groups ($P < 0.05$) (Table 1). The rate of use increased with age, and 15-year-old students used steroids significantly more often than younger students ($P < 0.05$) (Table 2). The two 15-year-old students who tried steroids were Asian.

There were significant differences in some responses to survey statements between steroid users and nonusers. More steroid users (60 percent) than nonusers (38 percent) thought steroids would make them "perform better in sports" ($P < 0.01$). Fifty-seven percent of the users thought that if they used steroids they did not "have to exercise or eat well to get big muscles" compared with 36 percent for nonusers

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($P < 0.01$). Fifty-three percent of steroid users and 71 percent of nonusers knew that steroids could "cause females to lose breast development" ($P < 0.025$).

There were 601 students (77 percent) who planned "to participate in high-school sports," and 25 (4.2 percent) had tried steroids. Five of the 181 (2.8 percent) students who were not planning to participate in high-school sports had tried steroids. Those students who planned to participate in football and wrestling used steroids significantly more often when compared with others not in these sports. Many students planned to participate in more than one sport (Table 3).

Eighty-three percent of the steroid users had tried other drugs. More steroid users than nonusers had tried alcohol (43 percent versus 13 percent, $P < 0.005$), and marijuana (47 percent versus 25 percent, $P < 0.005$) (Table 4).

Discussion

This study is the first to document use of steroids in junior high-school students. Our finding of a 3.8 percent rate of use confirms findings of other studies that report steroid use starts before high school. Considering that 2.3 percent of 12-year-old students admitted to trying steroids, use could start before junior high school.

Equally alarming is that 30 of the 41 (73 percent) who had been offered steroids in the past had used them at least once. This finding might reflect that availability could promote use or that steroid users see little danger in their use.

Table 3. Survey Participants Intending to Play Each Sport in High School and Those Who Had Tried Anabolic-Androgenic Steroids.

Sport	Number Who Planned to Play in High School*	Students Who Had Tried Steroids No. (%)
Football	169	11 (6.5)†
Track	77	5 (6.5)*
Wrestling	41	6 (14.6)‡
Swimming	164	9 (5.5)
Baseball	195	8 (4.1)
Other sports	249	12 (4.8)
No sports	181	5 (2.5)

*Many students planned to participate in more than one sport.
†Association significant at $P < 0.025$.
‡Association significant at $P < 0.005$.

Table 4. Percentage of Students Who Had Tried Other Drugs in Anabolic-Androgenic Steroid User and Steroid Nonuser Groups.

Drug Used*	Steroid Users	Steroid Nonusers
Tobacco	30	25
Alcohol	43	14†
Cocaine	20	31
Crack (methamphetamine)	23	32
Marijuana	47	26†

*Many students have tried more than one drug.
†Association significant at $P < 0.005$.

Anabolic-androgenic steroid users were more misinformed about the effects of steroids. More than one-half believed gains in strength and mass were possible without exercise. In fact, good diet, previous training, and continued training are needed to show gains.[18] Paradoxically, steroid use could limit a student's potential for growth by causing premature epiphyseal closure.

It is not surprising that 83 percent of steroid users planned to participate in athletics, as many thought steroids would enhance their performance. Our findings are similar to those of Buckley, et al.,[1] who reported that 64.8 percent of male senior high-school students who used steroids participated in school-sponsored sports, and to those of Terney and McLain,[2] who reported that 79 (84 percent) of 94 students using steroids were sports participants.

Our findings showing 83 percent of steroid users have tried other drugs are similar to those of Whitehead, et al.,[19] who found that more than 70 percent of high-school steroid users have tried other drugs. Peer pressure, the drug culture, or impulsive behavior characteristic of adolescents could explain the strong correlation, especially for those who tried steroids only once.

The higher-than-expected number of 15-year-old students in 7th grade could be due to previous poor academic performance, or it could reflect a large number of recent Southeast Asian immigrants who for language reasons were assimilated in classes with younger students. Accumulated exposure to drugs might explain the higher rate of steroid use in older students.

Higher rates of steroid use were expected in students participating in the so-called power

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sports such as football and wrestling. Steroid use in students in nonpower sports was surprising but could reflect athletic participation in more than one sport by many students. It could also reflect a desire for enhanced appearance, which has been reported as a major reason for steroid use.[1,19]

Because 89 percent of the students knew steroids existed and 18 percent knew where they could buy them, there were a large number of students who could potentially try steroids. In particular, increasing age, African-American race, participation in power sports, and past use of alcohol or marijuana were characteristics associated with steroid use. While male students were more likely to have been offered steroids, use by female students was a problem, with 3.2 percent having tried steroids.

Why a smaller percentage of whites participated in this study is unclear. White students could comprise many of the group of "undesignated" race or might not have been motivated to participate because of confidentiality concerns. If the white students not participating were steroid users, it would explain the different rates of use between whites and those of other races. On the other hand, the overall rate of steroid use (3.8 percent) that we measured would be falsely high if many of the nonparticipating whites were nonusers.

As with all survey studies, the possibility exists of incorrect reporting by the participants. Underreporting steroid use was more likely than overreporting because students would be concerned about confidentiality, and steroid users might have been less motivated to get parental consent to participate in the survey.

The results of this survey demonstrate steroid use at an age younger than any previously reported. These findings would not be applicable to all populations of this age group, but they raise questions as to how widespread steroid use is at this age and when use actually starts.

Although steroid use will likely be further documented at this young age, there is a more pressing concern: how can we effectively prevent steroid use before it starts? Television, friends, and magazines are more frequent sources of information about steroids than physicians.[2] Education about steroid use in students of high-school age is ineffective if done as a one-time intervention[20] or if scare tactics are used.[21]

As caregivers of the adolescent population, family physicians need to be aware that steroid use is a problem at this age. Seldom the source of information about steroids, physicians must take the initiative to discuss steroid use and its potential adverse effects with their patients. These discussions should occur before others who are less qualified become information sources.

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