

THE ABUSE OF ANABOLIC-ANDROGENIC STEROIDS BY POLISH SCHOOL-AGED ADOLESCENTS

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Abstract. Although anabolic-androgenic steroids (AAS) are perceived primarily as doping agents for athletes, these substances are also used by adolescents for aesthetic purposes. The aim of this study was to determine the knowledge about AAS, the extent, main reasons and consequences of its use among adolescents in Katowice, Poland. An anonymous questionnaire were answered by 1175 students, both sexes, attending three types of schools: grammar, secondary school preparing for university and vocational school. The results suggest that most adolescents, especially from grammar schools, know nothing or hardly anything about AAS and health consequences of using them. Moreover, 9.38% males and 2.08% females were abusing AAS or had abused them at some time of their life. Students from vocational schools had a higher usage rate of AAS than pupils from the other two types of schools. For most of the users the main reasons for using AAS are connected with the will to change their bodies so as to improve appearance by gaining muscle mass, reduce body fat and/or improve muscle cut. Over a half of the users had suffered from some side effects of AAS: acne, hair-loss, sexual disturbances, irritability, voice deepening, depression etc. The results of this study suggest that there is an urgent need to include AAS issues into drug education programs. *(Biol.Sport 23:225-235, 2006)*

Key words: Adolescent - Anabolic-androgenic steroids - Abuse

Introduction

Although AAS and other anabolic agents, like β 2-agonists or peptide hormones are considered by many people as doping agents used by professional athletes, there is a segment of people, most of them young, who reach for them although they are practicing only recreational sport or even do not practice sport at all, but

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they want to be up to cultural ideals of thin, muscular body shape [19]. From this point of view using AAS for non-medical purposes could be compared to such practices like plastic surgery (liposuction, silicon implants etc.), dieting, using electrical muscle stimulators etc. which enable quick, and for many people as effortless as possible, realisation of aesthetical and performance goals. According to some authors [17,31,25] abusing AAS by non-athletes in many western countries grown to the extent of a social problem, afflicting also children and youth. One of the first research aiming at determining the extent of AAS abuse by adolescents were conducted in the USA in the 80's by Buckley *et al.* [1], Windsor and Dumitru [34] and Johnson *et al.* [6]. The results of their research showed that AAS are abused by 5% to 11% of male and 1.4% female adolescents. Similar values were obtained in many later research, among them in research conducted within the national project Youth Risk Behavior Survey [4,10,23,28,30,32]. At the same time some authors claimed even so early "steroid initiation" as the age of 8 [30]. Similar tendencies have been observed among adolescents in other countries – Canada, Sweden, Norway, France, Trinidad, the Republic of South Africa etc. [3,5,7,8,11,12,13,14,15,16,21,26,27,33].

The extent of AAS abuse by adolescents in Poland has remained an open question because of lack of proper research. Indirect information has been provided by Taniewski *et al.* [29] who have researched 285 students from the Academy of Physical Education, secondary school and athletic school and 45 persons attending Body Club. The authors found that 67% of respondents answered affirmatively a question whether AAS in their social environment are used. Another author, Mędraś [18], wrote that doping is common among adolescents practicing body-building (not necessarily on the competition level), but he could not support his claims by any results of scientific research.

The purpose of the present study was to evaluate the knowledge of adolescents about the AAS and their side effects and to determine the extent of AAS abuse among young people, along with the reasons behind this behavior, patterns of use of AAS and health consequences of these practices.

Materials and Methods

The study was conducted by means of the method of diagnostic sounding. An anonymous questionnaire were answered by 1175 students (including 578 females) at the age of 15-22 (mean 16.75, SD 1.43) from grammar and secondary schools in Katowice, Poland. 290 students were recruited from grammar schools (GS; mean age 15.16, SD 0.39), 441 – from secondary schools preparing for university (SSPU;



mean age 16.70, SD 0.86) and 444 – from secondary vocational schools (SVS; mean age 17.85, SD 1.32). All analyses were performed with consideration to the division into sex and type of school and all calculations of significance of the relationships between variables were made by means of formulas: Pearson's chi-square and in some cases (when the observed and expected frequencies were small) also Fisher exact test and chi-square with Yates correction.

Results

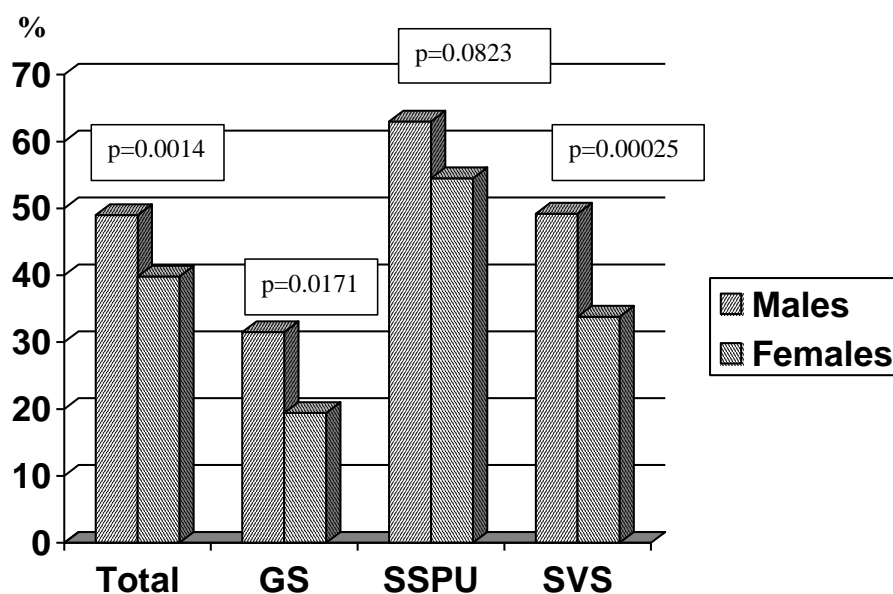


Fig. 1

Comparison of males and females who were able to define AAS

Knowledge about AAS and side effects of its use: The study showed that less than a half of adolescents ($n=523$; 44.51%) were able to define AAS and name these agents. Among those who gave correct answers were significantly more males than females. The same applied to each type of school, although in SSPU there was only a tendency toward significance of the relationships between sexes (Fig. 1). Females more often gave general definitions, without pointing out specific agents, for example: “steroids increase physical efficiency and improve body shape”, “agents which theoretically help gaining physical condition”, “they cause

rapid increase in muscle mass and improvement in endurance during effort”, “so called »koks« used by boys to increase muscle mass and improve physical appearance”. Only some females were able to give specific names of agents, mainly metanabol. Definitions given by males more frequently included names of specific agents (frequently in their slang qualification): omnadren (called “omka”), testosteron (called “teść”; a play on words because it also means father-in-law), deca-durabolin, metanabol (called “metka”), sustenon, HCG (human chorionic gonadotropin, although this substance does not belong to AAS, but peptide hormones), winstrol, primabolan, superanabol, parabolan, proanabol, dianabol.

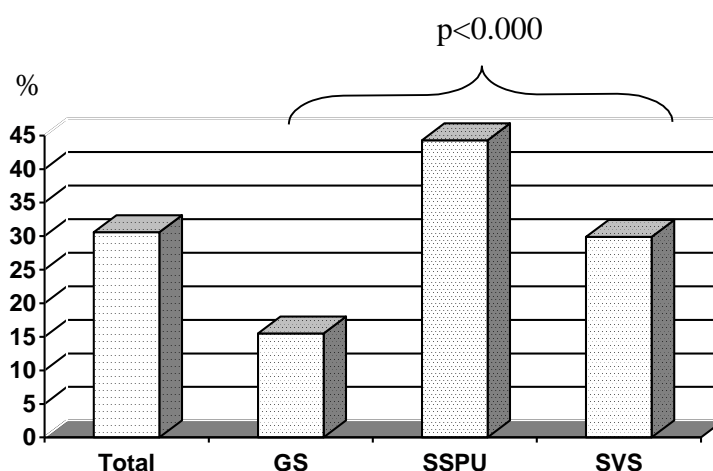


Fig. 2

Percentage of adolescents who revealed recognition of side effects of AAS

Only 359 (30.55%) respondents revealed recognition of side effects of abusing AAS, especially males and students from SSPU (Fig. 2). Cardiovascular illnesses (cardiac hypertrophy, heart attacks), reproductive disturbances (impotence, infertility, testicular atrophy), skin changes (acne, hair-loss, stretch marks, facial hair in females), psychiatric effects (overexcitability, irritability, mood swings, being excessively touchy and overreacting, aggressiveness), hepatic injuries, addiction and death were the most frequently quoted side effects. Some students recognized excessive muscle grow as a side effect. Some of the students expressing their opinion about side effects of AAS stated that they are based on their personal acquaintance of peers using these agents – for example one of the females wrote

“stretch marks and they can’t manage in sex (my boyfriend for example)”, and another “nervousness and lack of self-control – I have seen that in my own eyes”. Of course among respondents writing about side effects of AAS there were users of these agents (see further), and a percentage of them was significantly higher than of non-users (44.12% and 31.24%, respectively, $p=0.0274$). This is not surprising as users are “by nature” more interested in the effects of AAS on humans, also negative ones (although they frequently underestimate the gravity of these effects), furthermore some of these people experienced side effects of AAS on their own bodies.

Sources of knowledge about AAS: Only a small part of adolescents’ knowledge about AAS comes from sources, that could be deemed to be desirable from the educational point of view, for example from health/physical educators. Yet, for the most part of the interviewed (73.11%) the major source of information about AAS were peers. The second source of information was press (33.49%), especially magazines for body-builders, like “Flex”, “Muscle”, “Kulturystyka i fitness” (“Body-building and fitness”), “Forma” (“Shape”), but also sport newspapers, pop magazines (for example “Bravo”, “Girl”), popular science magazines (for example “Świat Wiedzy” – “The World of Knowledge”), and newspapers and weeklies (for example “Polityka” – “Politics”). It should be mentioned that however sports magazines can be useful in educating young people about AAS (and other doping agents), contents of some articles (especially in body-building magazines) are frequently morally ambiguous, to say the least. For 15.96% of the adolescents the source of information about AAS are books – scientific (however respondents do not specify what they mean by “scientific”), popular books about drug addiction, textbooks of biochemistry and medicine and handbooks of doping practices coming from underground printing. Other sources of information included TV (9.09%), coaches/sports instructors (7.42%) and internet, and for few respondents (one percent and less) also school and teachers (for example lessons of prophylaxis of addiction), parents (for one male it was a parent working as a coach) and other family members (especially siblings, and for one of the interviewed uncle, who himself was AAS user), leaflets/posters and for a few males simply ... their own experience.

Over one third of adolescents ($n=399$; 33.96%) admitted that they personally know somebody taking AAS, and for 33 (2.81%) respondents AAS users are “nearly all of my acquaintances”, “nearly everybody in our gym” or a “many many people around me”. Males were significantly more likely to know AAS users than females – 243 (43.78%) compared to 156 (28.07%), respectively ($p=0.0005$).



Abuse of AAS by adolescents: Of the 1175 adolescents surveyed, 68 (5.79%) reported past or present abuse of AAS (and other anabolic agents, like growth hormone or insulin) and 35 (2.98%) didn't answer the question regarding this issue. The vast majority of AAS users were males (n=56; 9.38% of all males or 82.35% of all AAS users, compared to 12 females; 2.08% of all females) and students from VS (75.35% of all users and over 11% of students in such type of school) (Table 1). The lowest age of "steroid initiation" was 11, usually 16-17.

Table 1

Adolescents who reported past or present abuse of AAS

	Number	Percentage	Signiff. of the relationship
Total	68	5.79	
Male	56	9.38	P<0.0000
Female	12	2.08	
GS	11	3.79	
SSPU	8	181	p<0.0000
SVS	49	11.04	

The most commonly taken AAS include: metanabol, omnadren, deca-durabolin and primabolan, usually taken in so called cycles, consisting of alternating phases of taking and discontinuing drugs (for example as one of the respondents wrote "cycle three months – one month break"), according to the so called pyramid method (for example "metanabol pyramidally 3 tablets for 5 days, 4 for 5, 5 for 5, 4 for 5, 3 for 5, plus deca-durabolin twice a week") and so called "stacking" pattern (simultaneously taking two agents of different form – oral and intramuscular (for example "metanabol up to 6 tablets a day, omnadren up to 6 ampoules a week, testosteron up to 3 ampoules a week"). Although it is difficult to assess what doses were taken by the adolescents, it seems, however, that in some cases they considerably exceed therapeutic doses, what of course increases the risk of appearing of side effects. It is some consolation that not every AAS user is willing to continue taking this agents – over one third of respondents (38.24%) declared that taking AAS is a question of the past. Reasons for this resignation were different and it is possible to distinguish some coherent groups among them:

- health reasons
- common sense reasons, and
- financial reasons.



From the educational point of view groups of decisions based on “health” and “common sense” could be considered as the most favorable. The former group consisted of the statements in which respondents emphasized making themselves aware of harmfulness of AAS (for example “for the fear of health problems”, “they harm”), sometimes because of suffering some side effects (for example “I got stretch marks”). The group of “common sense” reasons consisted of the statements grounded not so much on health motives but rather resulting from achieving some level of cognitive maturity (for example “because after some time I would become nobody”, “I grew up”, “because it has no sense”). Financial reasons were another motive of ceasing to use AAS which distinguished another coherent group (for example “lack of money and time to go to a gym”, “lack of money”, “I hadn’t money”, “this stuff is too expensive”). This type of motives cannot be regarded positive because it is not based on changes in the way of thinking or in attitudes of users, and as such they don’t assure constancy of behavior. There were also single statements which were difficult to qualify for any of the aforementioned groups, for example disappointment (“AAS are not so super I’d rather prefer supplements”), curiosity (“I took them out of curiosity”), ending of a cycle (“I ended the cycle” – but it is difficult to recognize if this respondent really stopped taking AAS, or simply put them aside for some time and will take them again), and evasion from giving clear-cut reason (“because so”).

Adolescents were also asked to identify reasons of using of AAS. This question was answered by 56 students (82.35% of AAS users), 10 females and 46 males. The study showed that the dominant motives are aesthetical, thus connected with improving ones appearance – increasing muscle mass, improving muscle cut and/or decreasing body fat, without treating them as a means of athletic performance (36 male users and 7 female users; χ^2 $p=0.5750$, χ^2 with Yates correction $p=0.8827$; Fisher exact test $p=0.6817$). The “sport” motive declared only 7 students (including 5 males), followed by improvement of self-confidence/level of aggression, accelerating healing of contusion and increasing strength (as a single motive declared by one male respondent in the space provided).

Side effects experienced by AAS users: The most of AAS users experienced some side effects – 60.29% while on drugs and 54.41% after discontinuing the use of AAS (for example during a break between cycles). Adolescents who experienced side effects while on drugs in most cases (41.46%) reported one such effect and it was especially a skin problem – acne, stretch marks or hair loss, but also liver disturbances, mood swings, irritability and aggression, sexual/fertility disturbances (for example changes in testicular size and function, menstrual disturbances), and one of the female users reported voice deepening. 36.59% of



users admitted experiencing two side effects, in which dominated mood swings, irritability and aggression in conjunction with acne (40.00% users in this group) or sexual/fertility problems (one female wrote about complete disappearance of menstruation – amenorrhoea), but also skin changes in conjunction with sexual/fertility problems, voice deepening, liver problems and gynecomasty. 17.07% of AAS users reported experiencing three side effects, which were a combination of skin changes, clitoral hypertrophy, mood swings and liver problems. Two persons reported experiencing four side effects: hair loss, gynecomasty, liver problems and acne in one of them and testicular atrophy, liver problems, acne and cardiovascular problems in another. As mentioned earlier, over a half of respondents (54.41%) declared experiencing health problems during the after use period of AAS. Most of these people (72.97%) admitted one side effect, first of all being in bad mood, followed by headaches, thoughts of starting a new cycle as soon as possible and episodes of depression. One female user additionally reported impossibility of arousal during sexual intercourse. 18.92% experienced twofold kinds of complications, with domination of thoughts of starting a new cycle as soon as possible in conjunction with worsening of mood, headaches or depression. The same problems occurred in users who reported experiencing three side effects during the period of discontinuing AAS.

Discussion

The study described in this paper was, according to the author's knowledge, the first in Poland the purpose of which was to estimate the extent of AAS abuse among school-aged adolescents. The reported prevalence of AAS abuse – 9.38% of male adolescents and 2.08% of female adolescents – is similar to those reported in research conducted in other countries of western civilization.

The most frequent reasons inclining adolescents toward using AAS were connected with shaping their bodies in a manner allowing realization of cultural ideals of bodyshape. It should be remembered that physical attractiveness contribute to general self-esteem and therefore for some young people attractive body is so important that are ready to risk their health in order to gain it. As an outstanding writer Lew Tolstoj wrote “nothing influences a human being so strong as his appearance, and as a matter of fact not the appearance itself, but his belief about being attractive or not attractive”. Of course some adolescents use AAS for more “utilitarian” reasons, for example enhancing sports performance or to feel more confident in their abilities. The authors of the report “The body image study. A qualitative study of the use of performance-enhancing drugs by non-athletes”



prepared for The Canadian Centre for Drug-Free Sport [3] suggests that AAS users could be divided into two groups: body image group and performance group. The first one consists of people desiring attractive body – better outlined muscles (“cut users”) or more muscle mass (“bulk group”), the second – of athletes and people whose social role require big and strong muscles from them (for example bouncers) [20].

AAS abuse by adolescents may have very detrimental effects on health. The study showed that on one hand not many adolescents are aware of adverse effects of AAS and on the other majority of users experienced some of the effects on their own. It should be remembered that although some side effects are reversible after the drugs are discontinued, some of them may cause permanent changes in the body, leading even to death [24]. Besides, some side effects, like mood swings and aggressiveness (“roid rage”), may be sensed by social environment of an AAS user [31].

There is an urgent need to do further research on the phenomenon of abusing AAS by Polish adolescents for non-athletic purposes. It is still more urgent to include issues of AAS abuse in the programs of health education.

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