Determinants of drug use in sport: a survey of Italian athletes

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Abstract

The aim of this survey was to study the socio-demographic determinants of drug use in sporting activities at an amateur level in Italy. In 2000 a cross-sectional study was carried out in two Italian regions (Latium and Campania). The participants were 1056 athletes (age range: 16-35 years; 660 males and 396 females). The results show that 28.3% thought "doping" was creatine, 14.7% said racemed amino-acids, 5.8% said proteins, 24.7% did not know and finally 35.7% correctly recognised it as growth hormone. When asked if using drugs was acceptable in order to improve sporting performance, significant results were associated with age (OR = 1.64 for 18-24 years old and OR = 2.22 for 25-30 years old); gender (males were more prone to consider them acceptable); type of sport undertaken (OR = 1.34 for athletes who practice team sport); educational level (athletes with an elementary level education are at higher risk), and knowledge of the effects of anabolic agents (OR = 0.6 for athletes with poor knowledge). The findings of our study confirm the need to implement preventive interventions, with a special focus on healthier behaviour, for reducing factors that encourage the use and the willingness to use licit and illicit drugs.

Keywords: doping, drugs, sport, socio-demographic determinants - Italy

Introduction

Doping, the use of performance enhancing drugs, has reached wide levels of diffusion in sport. This is problematic, both for the potential effects it has on an athletes' health status and for sport related economic interests.

It is only in recent times that doping in sport has been considered from a public health point of view, and studies have demonstrated its wide diffusion across every sporting level.

Doping in children and adolescents is estimated at 3-5%, whilst for adults the prevalence is 5-15% (self-reported studies) or 15-25% (projected use studies).[1-5]

Factors associated with adolescent use of doping agents seem to be poor self-esteem and health related knowledge or attitudes,[5] as well as life style factors (tobacco and alcohol consumption) and attitudes towards drugs.[4]

In Italy the new law for doping control and prevention was approved by the Parliament at the end of 2000. Using statistical data from CONI anti-doping controls,[6] it is possible to see, in the period after the new law was put in place, an 11% decrease in the number of positive test results. In Italy, in 2000, out of 10 912 anti-doping controls, 98 (0.898%) were found to be positive. In 2001, on the other hand, out of 8862 controls, 71 (0.801%) were found to be positive.

The mean percentage values (and 95%CI) for positive test results obtained during anti-doping controls for the years 2000-2003 are presented in Figure 1. It is noteworthy that cycling is the only discipline that is above the mean value. More recently, out of 735 controls taken by the Ministry of Health, almost 3% were found to be positive, particularly in non-elite sports.[7]

The aim of this survey was to study the socio-demographic determinants of drug use in sporting activities at an amateur level in Italy.

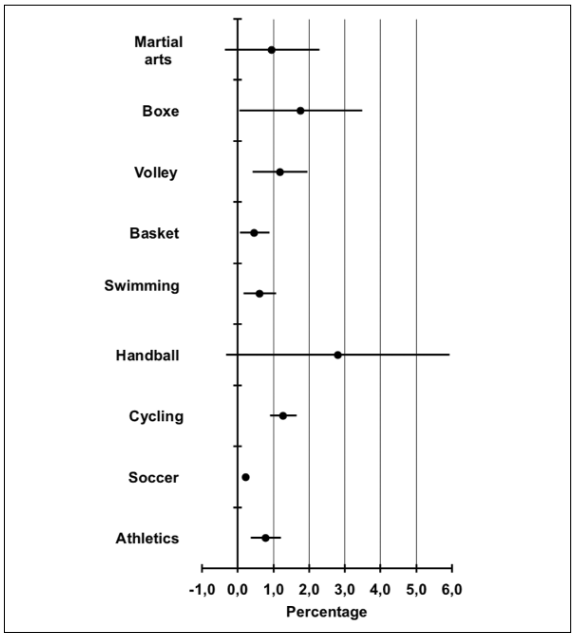
Methods

Population sample

In the period June-December 2000 a cross-sectional study was carried out involving amateur athletes of the following disciplines: athletics, basket, boxing, cycling, football, handball, martial arts, swimming, volleyball.

The questionnaire was administrated in two Italian regions (Latium and Campania), and sampled participants at the provincial level, as well as considering 5% of the athletes in the single Sport Federation. This paper presents the

Figure 1. Positivity and 95% confidence intervals regarding Italian athletes in 2000-2003 anti-doping controls (elaborated from[6]).



socio-demographic determinants of drug use (other results from this survey are presented elsewhere).[8]

Method

In this survey a self-administered anonimous questionnaire was used. The questionnaire, validated in a pilot study,[9] aimed to investigate the influence of socio-demographic factors on knowledge, attitudes and behaviour towards the use of drugs in sport.

The main areas under investigation were socio-demography, psychology and epidemiology.

The questionnaire was submitted to 1100 athletes before a training session, taking into account issues surrounding the privacy of their answers.

Statistical analysis

Frequency distributions were calculated and the differences between categorical variables was determined using χ^2 test.

Table 1. Characteristics of the athletes, by sex.

	Males (%)	Females (%)	p
Regions			
Latium	259 (39.2)	220 (55.6)	‹ 0.0001
Campania	401 (60.8)	176 (44.4)	
Age groups (years)			
‹ 18	179 (27.1)	93 (23.5)	
18-24	329 (49.8)	212 (53.5)	0.518
25-30	118 (17.9)	76 (19.2)	
› 30	56 (8.5)	31 (7.8)	
Educational level			
Elementary school	4 (0.6)	2 (0.5)	
Junior high school	109 (16.7)	42 (11)	
Senior high school	417 (64.1)	228 (59.7)	0.001
University	121 (18.6)	110 (28.8)	
Not responders	13	10	
Weekly sport activity (hours)			
≥ 8	262 (39.8)	180 (45.8)	
4-7	252 (38.2)	163 (41.5)	
1-3	132 (20)	46 (11.7)	0.006
‹ 1	12 (1.8)	4 (1)	
Not reponders	3	3	
Type of sport			
Athletics	92 (14.1)	65 (16.6)	
Basket	86 (13.1)	35 (8.9)	
Football	164 (25.1)	116 (29.6)	
Cycling	18 (2.8)	10 (2.6)	
Swimming	12 (1.8)	11 (2.8)	0.001
Handball	24 (3.7)	4 (1)	
Volleyball	174 (26.6)	115 (29.3)	
Boxing	26 (4)	1 (0.3)	
Martial arts	58 (8.8)	35 (8.9)	
Not responders	6	4	

Logistic regression models were used to determine the effect of independent variables. These were: age of the athletes (< 18: reference group), gender (male: reference group), sport practised (individual: reference group), educational level (elementary school: reference group), distance between home and training (distance < 4 Km: reference group) and knowledge of the effects of anabolic steroids (no: reference group). Regression analysis was conducted using the stepwise procedure (backward elimination), following the method suggested by Hosmer and Lemeshow.[10] Results are shown as Odds Ratios (OR) and p values.

Data processing, tests for significance and logistic regression analysis were performed with SPSS statistical software.

Results

One thousand fifty six athletes (response rate = 96%) filled in the questionnaires (age range: 16-35 years; 660 males and 396 females).

In Table 1, athletes characteristics are reported. While there was no differences between males and females for age structure, we found statistically significant differences for educational level (females having higher educational levels), intensity of physical activity (females spent more hours participating in sporting activity per week) and type of sport undertaken.

The majority (92.6%) of the respondents believed that, in order to become a high level athlete, only adequate training was necessary, whilst the percentage of those who thought that doping was "sometimes" or "always useful" was 5.1% and 2.3%, respectively.

For the question "if a friend of yours uses anabolic agents, do you", the responses were: 78.2% of the athletes would try to induce him/her to stop; 7.7% would ask for information; 3.6% would ask to use them, 7% gave other answers and 3.5% did not answer.

It is interesting to note that participants believed that doping was creatine (28.3%), racemed aminoacids (14.7%), proteins (5.8%) or they did not know (24.7%), whilst 35.7% of them correctly recognised growth hormone as doping. In this case there was a statistically significant difference in relation to gender, with females more frequently reporting that they did not know what doping was (34.7% *vs* 19.6% for males; $p < 0.0001$).

In Table 2 six different logistic regression models are presented. In the first model, the attitude to winning in sport is significantly associated with gender (males are more likely to consider this to be important), type of sport undertaken (OR = 1.81 for athletes who practice team sports), educational level (OR = 1.71 for junior high school in relation to elementary school), distance from home to training (OR = 0.74 for athletes who live further than 4 Km from their training place), and knowledge of the effects of anabolic agents (OR = 2.3 for athletes with poorer knowledge).

In the second model, the attitude to winning in sport by any means is significantly associated with the type of sport undertaken (OR = 2.54 for athletes who practice team sports), educational level (OR = 4.53 for junior high school, and 2.1 for senior high school, in relation to elementary school), and knowledge of the effects of anabolic agents (OR = 0.58 for athletes with poorer knowledge levels).

In the third model, the dependent variable was "using drugs in sport can help athletes" and this was significantly associated with the age groups (OR was almost double for athletes who were 18 years or more in relation to those who were under 18), gender (OR = 0.71 for females), educational level (OR = 0.26 for junior high school and OR = 0.41 for senior high school, in relation to elementary school).

In the fourth model, the dependent variable was "drugs are acceptable for improving in sport", and this was significantly associated with age (OR = 1.64 for 18-24 years old and OR = 2.22 for 25-30 years old), gender (males are more likely to consider them acceptable), type of sport undertaken (OR = 1.34 for athletes who practice team sports), educational level (the risk is higher for athletes with an elementary level education) and knowledge of the effects of anabolic agents (OR = 0.6 for athletes with poorer knowledge levels).

In the fifth model, the dependent variable was "using drugs is for improving performance", there were significant associations with age (OR = 2.16 for 18-24 year olds and OR = 2.22 for 25-30 year olds), gender (males were more likely to consider them acceptable), type of sport undertaken (OR = 2.00 for athletes who practice team sports), educational level (athletes with an elementary level education had a higher risk), and knowledge of the effects of anabolic agents (OR = 0.34 for athletes with poorer knowledge levels).

In the last model, the dependent variable was "I could use drugs to win in sport", and it is significantly associated with age (OR = 1.93 for 18-24 years old and OR = 2.06 for 25-30 years old), gender (OR = 0.40 for females), type of sport undertaken (OR = 1.82 for athletes who practice team sports), educational level (two to six times more likely for those with the lowest level of

Table 2. Results of the logistic regression analysis.

	Dependent variables OR					
Independent variables	**In sport it is important to win**	**In sport it is important to win with any means**	**Using drugs in sport can help athletes**	**Drugs are acceptable for improving in sport**	**Using drugs is for improving performance**	**I could use drugs to win in sport**
Age group (years)						
‹ 18 (reference group)			1	1	1	1
18-24	ns	ns	2.19*	1.64*	2.16*	1.93*
25-30			2.77**	2.22*	2.22*	2.06*
› 30			2.53**	ns	ns	ns
Sex						
Male (reference group)	1	ns	1	1	1	1
Female	0.62		0.71*	0.71*	0.44**	0.40**
Type of sport						
Individual (reference group)	1	1	ns	1	1	1
Team	1.81*	2.54**		1.34*	2.01*	1.83*
Educational level						
elementary (reference group)	1	1	1	1	1	1
junior high school	1.72*	4.53**	0.26**	0.09**	ns	ns
senior high school	ns	2.10*	0.41**	0.08**	0.55*	0.57*
university	ns	ns		0.05**	0.30**	0.17**
Distance home - training place						
‹ 4 Km (reference group)	1	ns	ns	ns	ns	ns
≥ 4 Km	0.74*					
Knowledge on effects of anabolic steroids						
Good (reference group)	1	1	ns	1	1	1
Poor	2.30*	0.58*		0.60*	0.34**	0.37**

OR = Odds Ratio; ns = not significant; * p ‹ 0.05; ** p ‹ 0.01

education), and knowledge of the effects of anabolic agents (OR = 0.37 for athletes with poorer knowledge levels).

Discussion

This survey suggests that some athletes would justify doping-use in order to improve their athletic performance, confirming the results of previous studies.[1,11,12] Athletes often consider doping as a means of improving performance, without taking into consideration the potentially health damaging health effects and this could lead to an underestimation of the effects. Therefore, doping is an urgent public health issue. Many athletes think that anti-doping laws should include measures for educating people about the health related problems associated with doping.[13] Anshel and Russel[14] suggest that educational programs for athletes about taking anabolic steroids could be of limited value in terms of creating appropriate and responsible attitudes towards doping in sport. Monaghan[15] stresses the importance of exploring the social meanings that illicit drug users in sport attach to their risk taking behaviours, considering they do not believe that doping can harm their health status. On the other hand, Laure and Lecerf[16] suggest that interventions based on health education could be effective in preventing drug use if the intervention took place amongst adolescents; this type of approach is essential if we consider that the use of performance enhancing drugs is increasing in this age group.[17] Moreover, some studies report that professional coaches are not the right people for preventing doping in sport, as some of them actually suggest the use of doping to their athletes and because of their poor level of training provided in doping prevention.[1,18]

Tricker and Connolly[19] suggest designing educational interventions encourage athletes to: adopt healthy lifestyles, develop decision-making skills and reinforce their personal perceptions and reasons for not using drugs.

Our study demonstrates that socio-demographic factors are associated with the current use or the willingness to use drugs in sport. Age, male gender, and low educational level were highly associated with the dependent variables. For

almost all of the independent variables considered (5 out of 6 models), females had a lower attitude toward winning in sport and towards drug use in sport. There was a trend between age-group attitudes toward doping use and increasing age (more than double OR for people over 25 years). Educational levels showed different patterns, in fact, people with an elementary level education tended to have less desire to win in sport, while on the other hand, athletes with the highest educational levels had a poorer attitude to using drugs in sport, but these differences did not reach a significance level.

The study had some limitations. The principal form of possible bias in this study, i.e. the accuracy of self-reported use of drugs in sport, should have been avoided, given the reliability of the tool we used, which had been validated in previous studies. A potential selection bias could have been avoided, even if we used a cross-sectional type of study design.

The findings of our study confirm the need to implement preventive interventions, with a special focus on healthier behaviour, on reducing factors that encourage the use and willingness to use licit and illicit drugs. A useful guide in this type of intervention is the social immunisation program, theorised by Evans in the '70s, during which children and adolescents learn to recognise and tackle the social pressures (family members, peers, environment and mass-media) of assuming substances. In this kind of educational program, information on the health effects of drugs are presented. Moreover, a very interesting program is proposed by Goldberg[20] for preventing the use of anabolic agents in males, based on knowledge regarding the effects of steroids, nutritional facts, and behavioural aspects considering steroid alternatives as well as the ability to develop skills to refuse drugs.

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