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Beliefs on and attitude toward doping use among athletes: an Italian survey

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ABSTRACT

BACKGROUND: data on the prevalence of use, beliefs and attitude towards doping substances and practices among Italian athletes are scarce.

METHODS: in 2006 we interviewed 508 Italian athletes in sports facilities, using an anonymous structured questionnaire to collect information on the athletes' beliefs about the role in performance and side effects of selected doping practices and substances, the reasons for use, obstacles in obtaining drugs, responsibility in the decision, changes in use in recent years, and anti-doping controls.

RESULTS: among the athletes, 88.2% believed that supplements were effective to improve performance and 4.8% that they were potentially dangerous. They believed that 87.0% of top-level athletes frequently use supplements, namely 69.1% anti-inflammatory drugs and 56.9% creatine. Doping was widespread in the opinion of 87.4% of athletes, and 45.3% thought it was used at all competition levels. Among those interviewed, 43.9% reported that athletes and coaches together were responsible for use, and 25.2% that it was easy to obtain substances. Lastly, 34.8% believed that doping use increased during 2002-05, and 54.7% thought that anti-doping controls should be more frequent.

CONCLUSIONS: this survey indicates that athletes believe that doping (mainly supplement use) is widespread at all competition levels, that athletes are aware of the seriousness of adverse effects and ask for more severe control and emphasis on potential dangers in the press.

Key words: Doping use, Athletes, Italy

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INTRODUCTION

The public's attention is drawn to the use of illegal substances and practices in sport mainly during world competitions and Olympic games, and/or following anecdotal episodes about individual top-level athletes' health problems or death after illegal drug intake or practices.

However, data on the prevalence of drug intake and illegal doping practices in sport are scarce. In 1988 the Italian National Olympic Committee (CONI) and National Research Council (CNR) conducted a survey on the knowledge and attitudes of Italian athletes to doping practices, and found that various doping practices were known to most Italian athletes and coaches and were used by a far from negligible number of top athletes (1).

Since then, many doping substances and practices have been modified, but little information has been reported (2). A survey in six developed countries, including Italy, reported that 2.6% of tertiary education students used doping substances (3). The percentages were similar in the six countries, higher among males, among students who had a friend using doping and among those who had participated in a major athletic event, while it was lower among biomedical school students. Another Italian survey, in 2000, showed that among amateur athletes those at greatest risk of using doping were males aged 25-30 years with a low educational level (4).

We report the findings of a survey conducted in 2006 in Italy to examine the beliefs about doping substances and practices among athletes of various sport specialities and different competition levels, as the development of anti-doping preventive measures requires a better understanding of athletes' beliefs about the risk of doping on health (3), and may help sport physicians to educate athletes, as part of their subspeciality (5).

METHODS

The survey was undertaken in April 2006 by the DOXA Institute, the Italian branch of the Gallup International Association, and was based on 508 face-to-face interviews with a national sample of athletes. Athletes were selected in sports facilities by a team of trained interviewers from DOXA on a quota basis, i.e. interviewers selected them on the basis of sex, age, geographical area, type of sport and level of competition. The study was conducted according to ethical principles, and all participants gave verbal consent to participate. The percentages of interviewed athletes practising various sports were: 19.1 soccer (small or full scale teams), 9.3 basketball, 10.4 swimming, 10.2 volley-ball, 6.7 tennis, 5.7 light athletics, 5.7 martial arts, 4.7 cycling, 3.9 water-polo, 3.1 gymnastics, 2.8 canoeing, 2.6 weight-lifting, 2.0 any equitation, 2.0 any skating, 1.8 rugby, 1.4 body building, 1.0 boxing, 1.0 fencing, 0.8 free-style combat, 0.6 any snow ski, 5.3 others. Athletes were also grouped according to type of sport: technical sports (including soccer, basketball, volley-ball, tennis, martial arts, water-polo, equitation, skating, rugby, fencing, ski), endurance sports (including swimming, cycling, canoeing, weight-lifting, body building, boxing, free-style combat) and other sports (light athletics, gymnastics, others).

The interviews were conducted in sports facilities with the interviewer presence only, using an anonymous structured questionnaire. No formal institutional review board existed in DOXA, but the survey was conducted according to the principles of the declaration of Helsinki, did not involve the processing of genetic information or personal data, was anonymous, and before the interview all subjects were provided with detailed information about the study and had to give verbal consent in order to participate. The response rate to each question was over 98%.

Athletes were asked about their beliefs on the effects on athletic performance of selected forms of doping practice (such as autologous blood transfusions) and substances (such as supplements, anti-inflammatory drugs, creatine, amphetamines, erythropoietin, anabolic steroids, beta-blockers, narcotic analgesics, diuretics, vasodilators). They were also asked about their beliefs on side effects of doping use, the reason for use, obstacles in obtaining drugs, responsibility in the decision to use them, changes in use in recent years, and their opinion on anti-doping controls.

RESULTS

Table 1 shows the distribution of athletes according to sex, age and competition level.

Table 2 sets out the athletes' beliefs about efficacy and induction of adverse effects of selected doping substances. About 88% of athletes thought that supplements could improve physical performances and 4.8% believed they could have adverse effects. The corresponding figures were 62.7% and 21.3% for anti-inflammatory drugs, 43.8% and 37.6% for creatine, 20.3% and 85.5% for amphetamines,

TABLE 1

DISTRIBUTION OF 508 ATHLETES ACCORDING TO SEX, AGE AND COMPETITION LEVEL

	NUMBER	%
SEX		
Men	376	74.0
Women	132	26.0
AGE (YEARS)		
< 20	134	26.4
20-30	220	43.3
> 30	154	30.3
COMPETITION LEVEL		
Local	198	38.9
Regional/inter-regional	170	33.5
National/international	140	27.6

TABLE 2

BELIEFS OF 508 ATHLETES (%) ON SELECTED DOPING SUBSTANCES' EFFICACY, ADVERSE EFFECTS AND PREVALENCE OF USE WITHIN THEIR OWN TYPE OF SPORT

	EFFICACY	ADVERSE EFFECTS	PREVALENCE OF USE[a]		
			FREQUENT	OCCASIONAL	NO USE
Supplements	88.2	4.8	87.0	3.5	2.0
Anti-inflammatory drugs	62.7	21.3	69.1	12.6	3.5
Creatine	43.8	37.6	56.9	14.4	8.1
Amphetamines	20.3	85.5	37.2	22.6	18.9
Erythropoietin	17.7	46.8	22.2	15.4	19.9
Anabolic steroids	21.9	84.7	27.8	22.9	22.9
Beta-blockers	7.4	30.9	15.4	13.4	16.7
Autologous blood transfusions	9.0	23.5	10.0	11.0	21.3
Narcotic analgesics	17.3	47.6	NI	NI	NI
Diuretics	16.7	38.2	NI	NI	NI
Vasodilators	18.5	35.7	NI	NI	NI

NI, no information available.

[a] The sum does not add up to 100 because some athletes gave no answer.

17.7% and 46.8% for erythropoietin, 21.9% and 84.7% for anabolic steroids, 7.4% and 30.9% for beta-blockers, 9.0% and 23.5% for autologous blood transfusions, 17.3% and 47.6% for narcotic analgesics, 16.7% and 38.2% for diuretics, and 18.5% and 35.7% for vasodilators. Answers were similar from athletes at various competition levels, and when they were grouped in three categories of type of sports in technical, endurance and other (not shown). Overall 73-79% of athletes thought that doping practices may have some adverse effects on health, 63-70% that athletes themselves underestimate the adverse effects of doping practices, and about 46-53% that the press underestimates such adverse effects (not shown in the Tables). The beliefs were not different at different levels of competition. Table 2 also shows the athletes' beliefs about the prevalence of use of selected doping substances and practices among top-level athletes within their own sport. They maintained that about 87% of top-level athletes frequently use dietary supplements, more than half anti-inflammatory drugs or

creatine, more than one third amphetamines, 22-28% erythropoietin or anabolic steroids, and 10-15% beta-blockers or autologous blood transfusions. Opinions were slightly different among athletes at various competition levels only for the prevalence of use of amphetamines (frequently used by respectively 41, 42 and 26% of top-level athletes in the beliefs of athletes at local, regional and top-level), erythropoietin (corresponding values 22, 27 and 18%) and anabolic steroids (33, 30 and 18%).

About 11-17% of athletes at local, regional and top-level reported that they had ever spoken to somebody at the same competition level and in the same sport habitually using amphetamines, or anabolic steroids, or erythropoietin, or all these substances. About 12% of athletes reported it had been proposed to them to use these substances, and 1.5% at local competition level, 2.9% at regional and 5.0% at top-level reported that they had ever used them. The reason for use was to win competitions according to about 56% of athletes at local, 65% at regional and 67% at national/international level (not shown in the Tables).

About 87% of athletes believed that the use of doping is widespread, and about 45% that it involved all competition levels (Table 3). The responsibility for the decision to use doping was the athletes themselves in the beliefs of about 25%, followed by the coach's suggestion in the belief of about 23% of athletes, and the choice was both personal and due to the coach for about 44% of athletes. About 25% reported that it was easy to obtain doping substances and about 36% that it was moderately difficult. Almost 35% believed that doping use increased during 2002-2005, while 14.0% believed it decreased. There were no substantial differences in the answers of athletes at local, regional and top competition levels (Table 3), and when athletes were grouped in three categories, as technical, endurance and other sports (not shown).

About half the athletes thought that anti-doping controls did not exist or were infrequent, that they should be more frequent and that they are not or poorly effective, and almost 84% thought they could be more effective, with substantial consistency among the answers of athletes at various competition levels (Table 4) and types of sport (not shown). About 90% of all athletes believed that anti-doping controls should be done periodically by sport associations, during training and not only during competitions, and 72% believed that only a small proportion of athletes using illegal doping practices is discovered during anti-doping controls (not shown in the Tables).

DISCUSSION

These results suggest that athletes believe that doping practices, mainly supplements, are widespread at all competition levels and had not decreased over the last few years. The decision to use doping is often a combined decision of athletes and coaches, although most athletes believed there are adverse effects with some forms of doping.

These findings should be interpreted with caution, since the sample was identified by the assignment of interviewers to certain locations with a quota of interviews on the basis of type of sport, level achieved in that sport, sex and age. In the most serious cases of doping, athletes were probably more reluctant to take part in the study and therefore more likely to refuse. However, the questionnaire were anonymous, the athletes were not chosen on the basis of lists, and DOXA is familiar to the Italian public as an independent organization with a long tradition of respect for anonymity and privacy, encouraging interviewees to collaborate. Subjects rarely refused the interview, and after some initial hesitation by a few athletes, collaboration was good and relaxed. Moreover, in our survey, to the direct question whether the athlete had ever used some form of doping, 1.5-5.0% answered positively, in agreement with the 4% reported in a French survey of high school athletes (6).

Another limitation is that recruitment was done in sport facilities and athletes frequenting them less often might have been under-represented. However, it is unlikely that athletes attending sport facilities less frequently will compete even at local level and they are less likely to use and to know about doping practices. Moreover, given the study sample, random errors may also have distorted the estimates, particularly for rarer doping practices.

Although the reliability and validity of data on these issues is always questionable (2), our findings are similar to those obtained in other surveys. In a survey conducted in 1988 (1) the widespread use of supplements emerged as the most frequent and increasing doping practice to boost athletic performance.

TABLE 3

BELIEFS OF 508 ATHLETES ON USE OF DOPING SUBSTANCES AND RELATED FACTORS ACCORDING TO THE COMPETITION LEVEL

	LEVEL OF COMPETITION (%)			
	ALL ATHLETES	LOCAL	REGIONAL/ INTER-REGIONAL	NATIONAL/ INTERNATIONAL
USE OF DOPING SUBSTANCES				
widespread	87.4	84.3	89.4	89.3
not widespread	7.7	10.1	6.5	5.7
not used	4.9	5.6	4.1	5.0
LEVEL AT WHICH USED				
national/international	40.4	39.4	46.5	34.3
all levels	45.3	46.0	39.4	51.4
not indicated	14.4	14.6	14.1	14.3
RESPONSIBILITY FOR DECISION				
athletes	24.8	28.8	22.9	21.4
coaches	23.2	23.2	21.2	25.7
athletes and coaches	43.9	38.4	48.8	45.7
not indicated	8.1	9.6	7.1	7.1
OBSTACLES IN OBTAINING				
substantial	12.8	11.6	9.5	18.6
moderate	36.2	36.9	39.4	31.4
easy	25.2	20.2	29.4	27.1
not indicated	25.8	31.3	21.8	22.9
CHANGE OF USE FROM 2002 TO 2005				
increase	34.8	35.4	36.4	32.1
no change	29.5	28.6	28.2	32.9
decrease	14.0	14.6	13.0	14.3
not indicated	21.7	21.7	22.4	20.7

Athletes at all competition levels believed that among top athletes the use of supplements was widespread, with 80-90% using them frequently. This is in agreement with other surveys conducted in Germany (7), Canada (8) and the UK (9), reporting that 55-75% of top-level athletes of all ages used supplements. A reason for the widespread use is that more than 95% of athletes believed that they have no potential adverse effects on health. However, this widespread use of supplements is worrying and contrasts with the lack of convincing scientific evidence of supplement-related ergogenic gains, in the presence of economic costs and potential harm for health (10, 11). Most athletes in our survey believed that anti-doping controls were not frequent enough and effective, in agreement with the opinion of more than 80% of coaches in a French survey (12), and with Waddington et al., suggesting that the relatively high level of drug use at lower competition levels is not reflected by positive anti-doping tests (13). Athletes in this survey reported that the responsibility for decision on the use of doping is 21-26% of times of the coaches, in agreement with a French survey reporting that more than 30% of coaches believed that athletes refusing doping have little chances of success (12).

CONCLUSIONS

This survey indicated that, in the opinion of athletes, doping (mainly supplement use) is widespread at all competition levels. It also showed that athletes were aware of the

TABLE 4

BELIEFS OF 508 ATHLETES ON THE EFFICACY OF ANTI-DOPING CONTROLS ACCORDING TO THE COMPETITION LEVEL

	LEVEL OF COMPETITION (%)			
	ALL ATHLETES	LOCAL	REGIONAL/ INTER-REGIONAL	NATIONAL/ INTERNATIONAL
FREQUENCY				
THEY ARE				
very frequent	10.0	9.1	12.9	7.9
enough frequent	28.7	29.8	24.1	32.8
not very frequent	38.0	34.4	40.7	40.0
not frequent	14.2	14.6	12.9	15.0
not indicated	9.1	12.1	9.4	4.3
THEY SHOULD BE				
more frequent	54.7	55.0	54.7	54.3
as they are	37.6	34.4	38.2	41.4
less frequent	1.6	1.0	1.2	2.9
not indicated	6.1	9.6	5.9	1.4
EFFICACY				
THEY ARE				
very effective	10.0	7.1	10.0	14.3
effective enough	28.7	25.8	28.8	32.9
poorly effective	34.8	38.3	31.8	33.5
not effective	12.8	13.6	14.1	10.0
not indicated	13.6	15.2	15.3	9.3
THEY SHOULD BE				
more effective	83.7	83.8	84.7	82.1
as they are	6.3	6.1	4.7	8.6
no more effective	3.1	2.0	2.4	5.7
not indicated	6.9	8.1	8.2	3.6

seriousness of adverse effects of some doping practices and/or substances, and they asked for more serious anti-doping controls also during training and for more emphasis on this health-related issue in the press. This is an indirect indication that most athletes are against the use of doping, but are pressed to use it.

CONFLICT OF INTERESTS: *the authors declare that they have no conflict of interest.*

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