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The anti-doping hot-line, a means to capture the abuse of doping agents in the Swedish society and a new service function in clinical pharmacology

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Abstract With the support of the Swedish National Institute of Health a national information service was started in 1993 aiming to capture the abuse of doping agents in the general public. It was organized as a telephone service, called the Anti-Doping Hot-Line, from our department and managed by trained nurses co-operating with clinical pharmacologists. Important information collected about all callers (anonymous) was: date of call, its origin, category of caller, doping experience and main question being asked. Abusers were asked about their age, sex, affiliation, abused drug(s), duration of abuse, habit of administration and adverse reactions (ADRs). Between October 1993 and December 2000 25,835 calls were received with a peak during spring and autumn. Most calls (12,400) came from non-abusers, 60% being males. Callers connected with gyms represented the largest group (30%). Most calls about specific drugs concerned anabolic androgenic steroids (AAS). Other drugs or products included ephedrine, clenbuterol and creatine. The most commonly abused anabolic steroids were testosterone, nandrolone-decanoate, methandienone and stanozolol. The ten most commonly reported ADRs of AAS were aggressiveness (835), depression (829), acne (770), gynecomastia (637), anxiousness (637), potency problems (413), testicular atrophy (404), sleep disorders (328), fluid retention (318) and mood disturbances (302). Female side effects included menstruation disturbances, hair growth in the face, lower voice and enlarged clitoris. During the period 1996–2000, totally 4339 persons reported about 10,800 side effects. This figure should be compared with the very low number of ADRs (27) reported by prescribers to the Swedish ADR committee during the same period. Abuse of doping agents appears to be a new public health problem that needs detection, medical care and prevention.

Keywords Anti-doping · Hotline · Doping agents

Introduction

Swedish health authorities, physicians and sport organizations alike have unanimously and consistently tried to combat the misuse of doping agents by athletes and other citizens since the beginning of this new public health problem. A laboratory for analysis of anabolic androgenic steroids (AAS) and other drugs abused to enhance the performance in sports was established in this hospital in 1980 and accredited in 1985 by The International Olympic Committee (IOC).

After a few years, the staff of this laboratory became the focus for questions from the public about the doping problem and its medical consequences to an extent that disturbed the main task. It became obvious to the authorities that there was a need for a national information service about the health hazards of this new form of drug abuse. With the support of the Swedish National Institute of Health, a telephone line was organized in October 1993 and localized at the Department of Clinical Pharmacology, Huddinge University Hospital. It was named the Anti-Doping Hot-Line. This paper summarizes our experience with this information service over a period of 8 years (1993–2000).

Aims

The original sponsor of the hotline suggested that the general aim of the national phone service should be to detect and prevent the misuse of AAS, growth hormone and other drugs used for doping purposes. The detailed aims of the service were:

- To answer questions from the public and health professionals about effects, side effects and other inherent risks with doping agents
- To facilitate a contact between abusers of doping agents and the health care system

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- To advise relatives and friends of abusers how to react rationally on the doping problem
- To identify active principles in various doping agents reaching Sweden
- To inform about legislation regarding doping agents
- To assist various organizations including public schools in their information about the doping issue
- To document the questions emerging from the work in the Anti-Doping Hot-Line
- To actively disseminate new knowledge resulting from the work in the Anti-Doping Hot-Line
- To work with prevention of doping abuse
- To perform and stimulate research on the medical, social and psychiatric effects of doping

Methods

All phone calls handled by the Anti-Doping Hot-Line during the period of October 1993–December 2000 are included. The information stems from the anonymous questionnaires that were filled in during and after every call. All data have been computerized. The Anti-Doping Hot-Line is managed by trained nurses who closely cooperate with the clinical pharmacologists and the Drug Information Centre (DRIC) at the department. During the years, a need for modifications of the original questionnaire became apparent. Since 1996, the same questionnaire has been used; therefore, the materials before and after 1996 are described separately. The complete information captured is described in Fig. 1. Important information includes: date of call, from which part of the country, total time of the call, age of those who consider an abuse, gender, category of caller, doping experience, measures undertaken, way of contact and main question being asked. Not all calls could be answered and dealt with depending on opening hours and the number of staff. By using services from a telephone company and the answering machine, we have been able to determine the number of “lost” calls.

In the case of calls from abusers, an additional questionnaire is filled in (Fig. 2). This information includes affiliation and age of the abuser, abused drug, duration of abuse, habit of administration, cause of doping abuse and adverse reactions. Information about the latter was collected on the basis of a list of possible side effects brought up during an interactive discussion. In addition, spontaneously reported side effects were recorded. The collected information was often complemented with a case report.

Results

Number of calls and contacts

The Anti-Doping Hot-Line received a total of 25,385 calls between October 1993 and December 2000. The number of calls per year varied between 2780 in 1994 and 4719 in 1996, with an average of 3572 per year. The variability in the number of received calls depends on factors such as working hours, number of employed nurses and media publicity. The answering frequency varied between the years and was 89.5% in 1996, 62.5% in 1997, 55% in 1998, 82.6% in 1999 and 66.5% in 2000. From 1993 to 1996, the working hours were from 1000 hours to 2000 hours from Monday to Friday. The opening hours are now from 1000 hours to 1600 hours Monday and Friday and from 1000 hours to 1800 hours Tuesday, Wednesday and Thursday.

The monthly distribution of calls over the years is shown in Fig. 3. Most calls were received during spring and autumn. Most of the callers are in great need of advice, support, information and education. Only a hundred calls are so called “funny calls” or “prank calls”. Approximately 7800 calls never reached the Anti-Doping Hot-Line.

A web site www.dopingjouren.nu started in May 1999 and had nearly 50,000 hits at the end of 2000.

Who is calling

Most of the calls came from non-abusers, 60% being males. The callers usually want to discuss their problems anonymously. Callers connected with gyms represent the largest group and the majority is male (94.6%). Gym is defined as any place in the society where people are training with weights. The only categories where female callers dominate are partners, parents and health care personnel. The different categories and the gender of callers using the Anti-Doping Hot-Line between 1996 and 2000 are listed in Table 1. In the category parents/siblings, 63% are females and 37% males, and among partners 87% are females and 13% males. In the group healthcare personnel, there are 62% females and 38% males.

Doping experiences among the callers

The callers can be separated into five groups according to their experience with doping:

- Those without doping experience (58%)
- Those with doping experience (17%)
- Those who know persons with doping experience (9%)
- Those who suspect someone to abuse doping substances (11%)
- Those who consider to abuse or have already been offered doping substances (6%)

Most of the callers belonged to the first category (14,800), 60% being males and 40% females. The second category included 4339 people, 95% being men and 5% females. The three remaining categories consisted of 2297, 2533 and 1531 calls, respectively. In the group with doping experience, the middle age was 21 years (range 14–53 years). The age distribution is seen in Fig. 4. The mean age was somewhat lower in the group of callers who was offered or had considered to use doping agents (Fig. 5).

Commonly asked questions

Common questions are “I have found a little ampoule in the training bag of my son, what could it be?” or “I think my daughter/son is abusing AAS. What shall I do?”

Fig 1 The Anti-Doping Hot-Line questionnaire

Date: _____ Call -Total time: _____ Number: _____

Gender

- Male
 Female

The caller's doping experience

- Yes, own
 Yes, that of others
 None

- Suspects someone to abuse
 The Hot-Line suspects the caller
 The caller considers abuse or has already been offered to use doping agents. Age: _____

Call from where: _____

Categories

- Gym" affiliation
 Sport affiliation
 Private person
 Friend
 Partner
 Parents
 Siblings
 Other Relatives
 Student/pupils
 Press/media
 Customs, police, law personnel
 Social welfare workers
 School personnel
 Healthcare workers
 Other persons

Measures undertaken

- Personal advice
 General information
 Study visit
 Information by mail
 Interview
 Other _____

Way of contact

- Phonebook/Number information
 Advertisement/Telly
 Brochure
 Friend
 IT
 Called before
 Other

Inquiry about

- Specific drug
 Side effects
 Seeking care or help to quit
 General information about doping
 Lab.tests/specimens
 Study visit
 Want lecturer
 Drug identification
 Other; _____
 Other; _____

- AAS
 GH (growth hormone)
 hcG
 Clenbuterol
 Ephedrine
 Narcotics
 Other drugs
 Diet supplements
 Creatine
 Specify drug product: _____

Question: _____

After identification of the substance, the conversation is about how to act and react on the abuse and what kind of help the family may get. The commonly asked questions during the years 1996–2000 are shown in Table 2.

Drugs being discussed

The major concern of the callers was related to AAS corresponding to 3372 calls of a total of 8427 calls about specific drugs (Table 3). Other drugs or products included ephedrine (871), clenbuterol (498) and creatine (348). More than one drug could be discussed at each time.

Drugs being abused

The most commonly abused anabolic steroids are testosterone (1479), nandrolone decanoate (868), methandienone (1421), stanozolol (486), unspecified AAS (1010) and other AAS (241) (Table 3).

Reported side effects

The ten most commonly reported side effects of AAS are aggressiveness (835), depression (829), acne (770), gynecomastia (637), anxiousness (637), potency problems

Fig 2 Questionnaire used for abusersGender

- Male
 Female

Affiliation

- "Gym"
 Sports
 Not clear
 Other _____

Age at the time of calling:
Age when abuse started:

Abused drugs

- AAS
 GH
 hcG
 Clenbuterol
 Ephedrine
 Narcotics
 Other drugs
 Diet supplements
 Creatine
 Other _____

Habit of administration

- Separate cycle
 Many cycles for one year
 Many cycles for 2 years or more

When did the abuse occur

- Last month
 > one year ago
 < two years ago
 > two years ago

Doping cause

- Not clear
 Better athletic performance
 Desire to look better and/or have bigger muscles
 Other _____

Reported side effects:

Conclusions:

(413), testicular atrophy (404), sleep disorders (328), fluid retention (318) and mood disturbances (302) (Table 4). Side effects typical for male abusers are gynecomastia, problems with the potency, smaller testicles, prostate enlargement and sterility. Female side effects are menstruation disturbances, male body image, hair growth in the face, lower voice and enlarged clitoris. Aggressiveness and depression are common in both males and females. The social consequences include assault and legal problems.

Discussion

The creation of an Anti-Doping Hot-Line in Sweden is the result of the ambition of the national health authorities to

prevent the development of a new kind of substance abuse in the society. The Swedish National Sports Federation alerted opinion makers in medicine on the problem with doping in sports some 20 years ago with articles in Swedish medical journals [1]. An anti-doping laboratory was organized in 1980 and the personnel soon became aware of the fact that the abuse of AAS was not restricted to professional athletes but also occurred among amateurs and the general public. The need for a special information service about the doping problem was obvious. It was considered important to provide this service from the health care system since many callers wished to get medical advice about the abuse problem.

This paper summarizes our experience with doping questions over a period of 8 years. Since 1993, we have

Fig 3 Distribution of calls between the months during the years 1993–2000

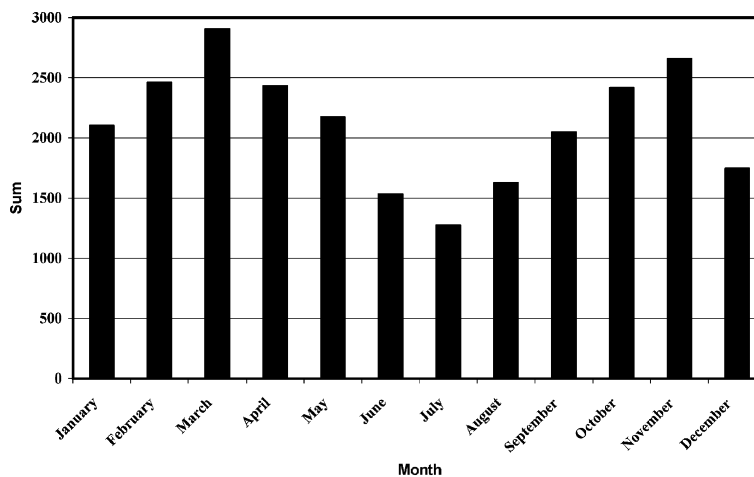


Table 1 Different categories and gender of callers (as a percentage) to the Anti-doping Hot-Line during the years 1996–2000

Category	Percentage	Gender	
		Male	Female
Affiliation with gyms	30	95	5
Persons of unknown category	15	79	21
Pupils/students	12	50	50
Athletes/affiliation with sport	9	84	16
Parents/siblings	7	37	63
Health care personnel	9	38	62
Social welfare and justice personnel	5	61	39
Partners	4	13	87
Media/press	3	55	45
Not reported	1	0	0
Others	5	52	48

received on average 3500 calls annually, predominantly from males. Thirty percent have been affiliated with gyms. The dominating age group are persons between 17 years and 30 years, with a peak at 20 years. Almost

60% of the callers lacked doping experience of their own, but 17% had abused doping agents. Most reports about the doping problem from schools concerned pupils aged 14–18 years and showed an increasing abuse of AAS [2]. Moreover, the annual reports of confiscation of AAS by the police and customs authorities showed a rise from 70,000 tablets and 8500 ml in 1996 to 417,000 tablets and 26,000 ml in 2001 [3]. The abuse of anabolic steroids thus appears to be an increasing health hazard that still seems to be unrecognized in many countries.

One-third of the questions concerned specific drugs/products, in particular AAS. Testosterone, nandrolone, methandienone (“Russian”) and stanozolol dominated among these drugs. A surprisingly high number of questions concerned the old-fashioned ephedrine and the veterinary medicine clenbuterol, a compound used to improve meat production in cattle. The same compounds dominated the list of drugs actually being abused.

A worrying pattern was the high number of questions about narcotics. In the case of GHB, there was a sudden increase in 1998, and in April 2000 the compound was

Fig 4 Age distribution of callers with own doping experience

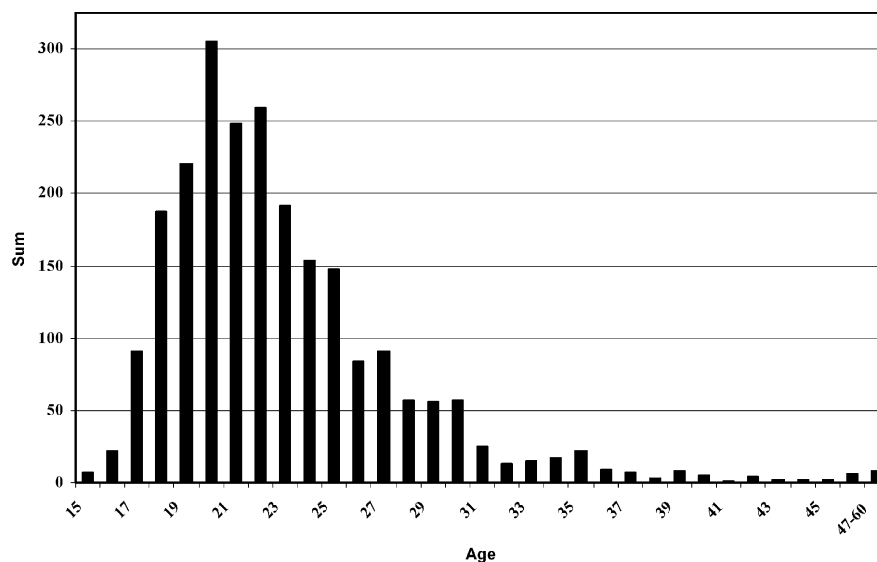


Fig 5 Age distribution of callers who had been offered or had considered to abuse doping agents

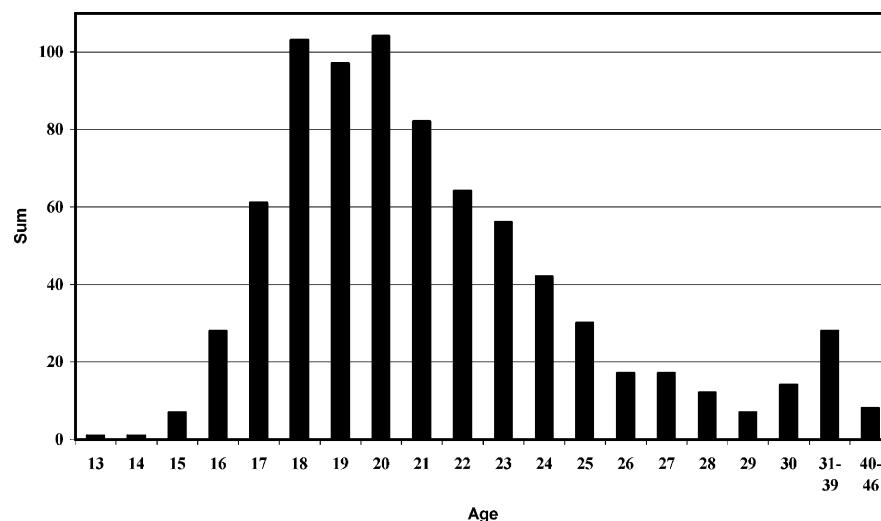


Table 2 Commonly asked questions, as a percentage of total. *n.a.* not asked

Questions	1993–1995 <i>n</i> = 7229	1996–2000 <i>n</i> = 18,156
Specific drugs	48	31
General information about doping	39	17
Study visit, want lecture	<i>n.a.</i>	13
Seeking care, side effects	<i>n.a.</i>	11
Drug identification	<i>n.a.</i>	8
Lab tests/specimens	<i>n.a.</i>	5
Others	13	15

classified as a narcotic. There is an interesting drop in 1999 of questions about hormones/precursors, which include androstendione, norandrostendione and dehydroepiandrosterone (DHEA), which were forbidden as dietary supplements and defined as prescription drugs in the same year [4].

The clients reported side effects that are well known from the literature with a variety of psychiatric, urogenital and endocrine symptoms [5]. Some symptoms were very well documented previously, such as the common occurrence of gynecomastia and “bitch tits” in men [5] and the occurrence of rather typical dermal striae or linear keloids [6]. Aggression was reported in 835 cases and is also a well-known side effect [7, 8]. The reports about increasing libido and personality changes confirm previous studies [9, 10].

In total, 4339 persons reported side effects. Of these callers, 709 (16%) had called before. This means that 3630 individuals reported about 10,800 side effects. This should be compared with the extremely low number (27) of adverse reactions of AAS reported to the Swedish Adverse Drug Reaction Committee between 1969 and 2002. Similarly the WHO ADR database has recorded 166 reports during the years 1996–1999. The discrepancy has several explanations. Thus, the spontaneous reports about side effects from physicians concern prescription drugs and focus on new or serious ADRs, while most side effects in Table 4 are well known and predictable

Table 3 Substances being abused/discussed, more than one drug/call is possible, and reported to the Anti-Doping Hot-Line during the years 1996–2000

Substance	Substances being abused; total sum: <i>n</i> = 7858	Substances being discussed; total sum: <i>n</i> = 8427
Anabolic androgenic steroids (AAS):		
Testosterone	1479	888
Metandienone (“Russian”)	1421	641
Nandrolone	868	598
Stanozolol	486	430
Different AAS	241	562
AAS unspecified	1010	253
Other hormones and “precursors”:		
hCG/tamoxifen	244	187
GH/IGF1	177	322
Hormones/precursors unspecified here	199	784
Others compounds:		
Ephedrine	406	876
Clenbuterol	214	498
GHB	96	288
Narcotics unspecified	278	167
Alcohol	16	11
Creatine	191	348
Dietary supplement	270	591
Other prescription drugs not specified here	262	1382

from the pharmacological properties of the drugs. Moreover, these reports concern therapeutic doses of anabolic steroids, while abusers use supra-therapeutic or even mega doses of these compounds. However, the massive flow of ADR reports to the Anti-Doping Hot-Line suggests that observations by the patients themselves may have a value in assessing the magnitude of problems with ADR.

A recent study [11] suggests that AAS should be looked upon as potentially addictive. This is of interest in relation to studies that have shown that AAS have discrete effects

Table 4 Reported side effects 1996–2000 among persons with doping experience ($n=4339$). More than one side effect can be reported from each person

Psychiatric symptoms	
Aggressiveness	835
Depression	829
Worries	657
Mood symptoms	302
Personality changes	416
Sleeping problems	328
Anxiety symptoms	282
Irritability	263
Withdrawal symptoms	248
Psychiatric unspecified problems	140
“The biggest the greatest and the best”	58
Body obsession	49
Fixation of training	20
Self fixation	48
Thinking of suicide and suicide attempt	20
Feeling callous	14
Urogenital symptoms in males	
Potency problems	413
Sexual problems	130
Increased virility	162
Smaller testicles	130
Micturition problems	108
Decreased virility	73
Ejaculation problems	65
Prostate enlargement	59
Increased hair growth	113
Application problems	
Pain after injection	94
Abscess after injection	75
Influenza-like symptoms	
Connected to the “cycle”	89
Pain symptoms	
Specified pain problems	135
Unspecified pain problems	108
Abdominal pain	103
Muscular-skeletal disorders	
Muscle cramp	94
Urogenital symptoms in females	
Menstruation disorders	23
Enlarged clitoris	23
Hoarseness, lower voice	24
Skin symptoms	
Acne	770
Skin striae	295
Exanthema	36
Unspecified skin problems	42
Pruritus	14
Endocrine symptoms	
Gynaecomastia	637
“Bitch tits”	118
Other symptoms	
Fluid overload	318
Headache	261
Perspiration disorders	187
Liver disorders	147
Renal function abnormal	131
Dizziness	99
Amnesia	90
Fatigue	87

on central monoaminergic transmission [12]. In our study, we had 248 reports about withdrawal symptoms.

The work at the Anti-Doping Hot-Line can be regarded as a special service in clinical pharmacology, similar to any other consultation dealing with irrational use of drugs and its consequences. This service provides excellent opportunities to get in touch with patients who desire a medical follow-up and assistance in stopping the abuse. It is a goldmine for research on drug abuse and its epidemiology. Our cooperation with social welfare institutions, forensic medicine, customs, police and other researchers in the field has been rewarding. To our knowledge there is no similar organization in any other European country.

Our impression is that the clients have a very positive attitude to our educational activities. This is not only true for the risk group itself but also for personnel from health care and social welfare organizations who have a great need for information, study visits and lectures. This, in turn, creates awareness about the problem, not the least among parents to teenagers exposed to environments with access to AAS.

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