

FOLIA MEDICA CRACOVIENSIA

Vol. LVIII, 3, 2018: 35–47

PL ISSN 0015-5616

DOI: 10.24425/fmc.2018.125071

Doping in sport — attitude and professional experience among physicians in Poland

RENATA DOMAGAŁA-RODACKA¹, TOMASZ RODACKI², DANUTA OWCZAREK¹,
DOROTA CIBOR¹, PAWEŁ ZAGRODZKI^{2,3}

¹Department of Gastroenterology, Hepatology and Infectious Diseases, Faculty of Medicine
Jagiellonian University Medical College, Kraków, Poland

²Department of Food Chemistry and Nutrition, Faculty of Pharmacy
Jagiellonian University Medical College, Kraków, Poland

³Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Science, Kraków, Poland

Corresponding author: Tomasz Rodacki, MPharm

Department of Food Chemistry and Nutrition, Faculty of Pharmacy, Jagiellonian University Medical College
ul. Medyczna 9, 30-688 Kraków, Poland

Phone: +48 12 620 56 70; E-mail: rodak13@wp.pl

Abstract: Introduction: The history of using performance-enhancing substances (PES) is long and it goes back to ancient times. At present, PES are employed at all levels of sport competition, starting from Olympic level contestants to individuals recreationally involved in various sports disciplines.

Purpose: The objective of the study was examining the views on doping in sports in a group of physicians, together with evaluating the frequency of their contacts with this phenomenon, in their professional activities.

Methods: The investigation was carried out using a validated questionnaire developed by the authors. Questionnaire included 34 questions divided into 6 sections. In total, 257 individuals participated in the study. The percentage of answers was 75.81%.

Results: Among the responders, 96.50% believed that using PES by sports competitors represented unethical behavior. 42% participants declared that they met doping problem during their professional career. Almost one-third of the physicians (28.79%) declared that during their work, they consulted patient suffering from adverse side effects resulting from using PES.

Conclusions: In Poland, physicians regard using PES as unethical behavior. They believe that a health care system professional should participate in counteracting doping in sports. Physicians — regardless of their specialty — are also exposed to PES-related problems in their professional work. In view of the above facts and the consistently increasing popularity of PES, extending the knowledge in this field

among physicians seems to be of importance to allow for their offering better medical services to their patients.

Key words: doping, physicians, performance-enhancing substances, sport, professional experience.

Introduction

Doping is a notion that may be most generally characterized as enhancing psycho-physical efficiency of a sports competitor by means of pharmacological substances [1]. The history of using performance-enhancing substances (PES) is long and it goes back to ancient times. The athletes employed herbal and mushroom infusions to improve their performance [2].

Since 1 January 2004, World Anti-Doping Agency (WADA) coordinate and monitor the fight against drugs in sports [3]. At the national level, this task is fulfilled by Polish Anti-Doping Agency (POLADA) [4]. WADA publishes annually new version of Prohibited List [3]. According to the structure of the List, substances and methods was divided into groups and subgroups [5]:

- Substances & methods prohibited at all times (In- and out-of-competition):
 - S0 — non-approved substances
 - S1 — anabolic agents
 - S2 — peptide hormones, growth factors, related substances, and mimetics
 - S3 — beta-2 agonists
 - S4 — hormone and metabolic modulators
 - S5 — diuretics and masking agents
 - M1 — manipulation of blood and blood components
 - M2 — chemical and physical manipulation
 - M3 — gene doping
- Substances & methods prohibited in-competition:
 - S6 — stimulants
 - S7 — narcotics
 - S8 — cannabinoids
 - S9 — glucocorticoids
- Substances prohibited in particular sports:
 - P1 — beta-blockers

At present, PES are used at all levels of sports competitions, starting from Olympic level contestants to individuals recreationally involved in various sports disciplines [6]. In 1997, Bamberger *et al.* performed a study in a group of Olympic level competitors. When asked “Would you use PES knowing you would not be caught and would win the competition?”, 98% of the subjects answered “Yes”. Subsequently, the above authors

asked “Would you use PES knowing you would not be caught and would win all the competitions in the period of 5 years and then die?” More than one-half of the subjects also responded positively [7]. The above findings illustrate the magnitude of score-associated pressure that weighs heavily on professional sportsmen and show how much they are prone to make sacrifices in order to gain the intended target. At the same time, the image of a high achiever created by the media is equated with graceful and slender females and muscular and athletic males. In consequence, a high number of individuals who are not professionally involved in sports start regular trainings. Such a situation is beneficial as long as the above-mentioned individuals do not attempt to use illicit support-providing substances; unfortunately, as it is demonstrated by investigations, non-professional sportsmen also use PES [7]. The scale of the phenomenon is quite extensive: among young individuals, the users of such substances account for 1–12% of the entire population. In individuals attending body building gyms and fitness rooms, the percentage ranges from 1 to 3% [8]. It is estimated that non-sportsmen exercising in body building gyms account for more than 3/4 of anabolic steroid consumers [9]. Based on the investigations conducted in the United States and Europe, it was determined that “the steroid initiation” might be seen even in 8-year-old children [10]. Estimations based on the amounts of illegal substances captured by police demonstrate that annually, anabolic androgenic steroids (AAS) may be taken by as many as 15 million individuals worldwide [9]. According to Mędraś *et al.*, adverse side effects (ASE) associated with AAS usage may be demonstrated in as many as 80–100% of users [9]. The ASE include such phenomena as increase of total cholesterol and LDL cholesterol accompanied by decreased HDL cholesterol, increased arterial pressure, prostate hyperplasia, gynecomastia, acne, androgenic alopecia, hypogonadotropic hypogonadism, aggression and addiction [9]. Other prohibited substances also could cause some serious side effects. Usage of growth hormone could be related to gynecomastia, hypothyroidism, edema or increase risk of some types of cancer [11]. Another, very danger ASE is hypoglycemia, which could occur after insulin usage as an anabolic agent [12]. Next prohibited drugs which could cause some serious side effects are stimulants. Most common ASE of stimulants are insomnia, aggression, addiction and increase risk of myocardial infarction or stroke [13].

In great measure, the problem of PES usage involves young people who are not aware of health-associated consequences of taking these substances [14]. All the above-described circumstances make physicians an important link in doping prevention in sports.

As it is said in the Medical Ethics Code, “A physician may not use performance-enhancing substances and methods for non-therapeutic purposes. Using substances and methods regarded as performance-enhancing in individuals engaged in sports is unethical” [15]. Also, the Sports Medicine Ethics Code approved in 1997 by the Executive Committee of the International Federation of Sports Medicine, in

its 12th article imposes upon physicians an obligation to oppose sportsmen using illegal substances that increase their physical fitness. In keeping with the passage from the Code “Accepting doping in any form is contrary to medical ethics” [16]. As it was demonstrated by the studies of Pope *et al.*, an obstacle in implementation of anti-doping activities may be found in lack of trust in physicians exhibited by sportsmen [17]. Thus, of significance is the answer to the question whether physicians are willing and have opportunities to implement anti-doping activities. Such studies were performed in the United Kingdom, France, India, Slovenia, Ireland, in Balkan countries, Senegal and in Australia [18–25]. To date, no analysis addressing the above subject has been carried out in Poland.

Objective

The objective of the present study was estimating the extent of PES-associated problems in every-day medical practice of physicians representing various specialties. The analysis also included the contacts of physicians with individuals manifesting ASE associated with PES usage. The authors also investigated opinions expressed by the physicians on methods of fighting doping.

Material and Methods

The study was granted approval from the Biomedical Board of the Jagiellonian University. (Opinion of the Bioethical Committee, Jagiellonian University, No. KBET/20/B/2013).

Questionnaire

The study was carried out employing a validated questionnaire developed by the authors.

The validation process consisted of two stages. Stage 1 involved presenting the questionnaire form to two specialists in the investigated field. Each specialist provided his comments that were taken into consideration in the questionnaire. Subsequently, 18 individuals participated in testing the questionnaire filling up the form twice, at least 7 days apart. The evaluation included the percentage of repeatable answers vs. all the answers. The acceptance threshold of repeatability was assumed to equal 70%. In addition to consistency percentage values, the authors calculated the values of gamma coefficient ($p = 0.05$). Repeatability (R) of responses in the entire questionnaire ranged from 72 to 100%, with the values of gamma coefficient (γ) being in the range of 0.616–1.000. Pursuant to the performed reliability tests, the authors confirmed the full appropriability of the questionnaire to be used in the study.

The questionnaire consisted of 34 questions divided into 6 sections. The present report concentrates on the data derived from sections I, III and IV that were

associated with the attitudes towards the phenomenon of doping in sports and with professional experience of the responders related to the above issue.

Study group

Data were collected between March 2013 and September 2016 during medical conferences and meetings taking place during specialist training courses. The questionnaires were handed out to 339 physicians. In total, 257 individuals participated in the study (145 females and 112 males). The percentage of the responders was 75.81%. The mean age of the participants in the study was 40.5 years of life. Table 1 presents data on the responders.

Table 1. Characteristics of responders.

Specialty	YES	174
	NO	83
Type of specialty	Internal Medicine	44
	Other	28
	Family Medicine	19
	Orthopedy	18
	Gynecology	14
	Endocrinology	13
	Cardiology	12
	Pediatrics	9
	Rheumatology	8
	Gastroenterology	5
	Sport Medicine	4
Place of employment	Hospital	103
	Medical clinic	53
	Hospital and Medical clinic	37
	Hospital and private practice	19
	Hospital, medical clinic and private practice	19
	Medical clinic and private practice	16
	Private practice	9
Regular sport activity	YES	103
	NO	154

The statistical analysis of the collected data was performed using MS Excel.

Results

In the responder group, 96.50% of the subjects regarded sportsmen using PES as representing unethical behaviors. At the same time, 85.99% of the physicians believed a person employed in the health care sector should participate in counteracting the phenomenon of doping in sports.

The physicians indicated that the most effective method of fighting doping (a multiple-choice question) was disqualification of the contestants. The answer was chosen by as many as 72.76% of the responders. Less than 1/3 of the participants in the study believed “information and education” to be an effective method of counteracting doping in sports. The responses of the physicians are presented in Fig. 1.

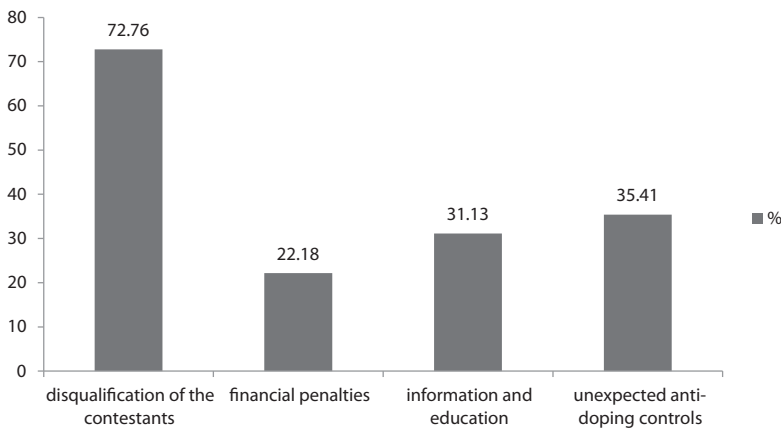


Fig. 1. Responders' answers to the question: What is, in Your opinion, the most effective method of fighting doping? (multiple choice question)

As many as 42.02% of the participants in the study declared that they were faced with the issue of doping during their professional practice. The division of the group with respect to their place of employment is presented in Fig. 2. Among these physicians, as little as 27.78% of the responders brought up the topics associated with PES on their initiative. According to the opinions expressed by the investigated physicians, in 62.04% of cases, the topic of doping was taken on the patient's initiative. When asked about the evaluation of their knowledge about PES, as seen in the context of the above situations, 43.50% of the responders believed it to be adequate. On the other hand, 46.30% of the physicians believed their knowledge of issues addressing PES was insufficient.

In the group of physicians who encountered the subject of doping during their professional practice, as many as 84.26% individuals declared that they had informed

the patients about health-associated consequences of using PES. Approximately 1/4 of the responders suggested consulting a specialist in sports medicine or presented alternatives available for substances of this type. The responses are presented in Fig. 3.

In the entire group of the investigated physicians, 24.12% of the subjects faced an attempt at forcing them to write a prescription for a medication that might have been used as PES.

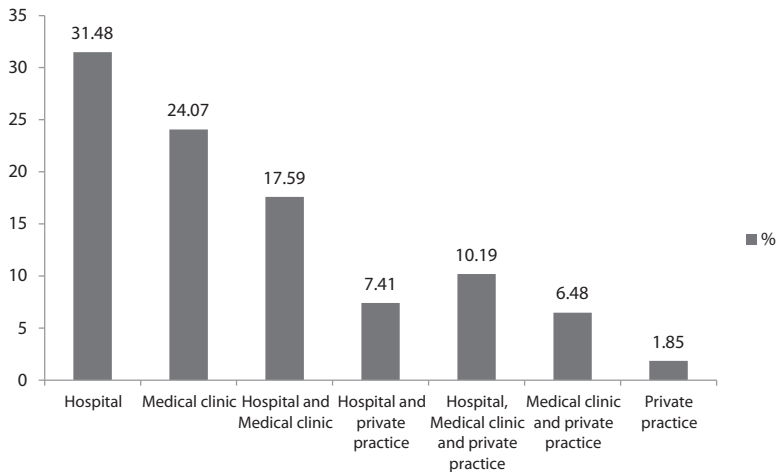


Fig. 2. Physicians who declared, that they faced the issue of doping during their professional practice — the division of the group with respect to their place of employment.

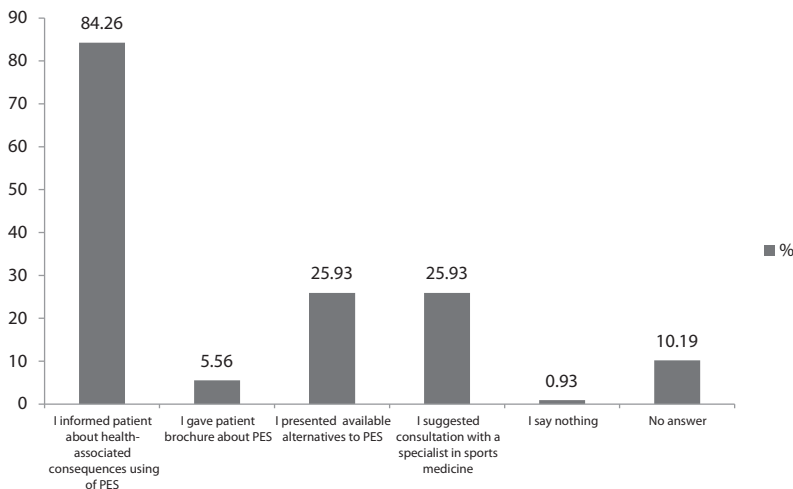


Fig. 3. Behavior during a conversation with a patient about PES (multiple choice question).

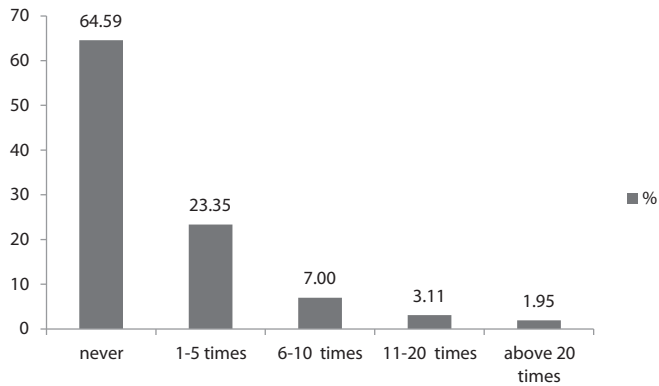


Fig. 4. Responders' answers to the question: How many times did You talk with Your patient about PES?

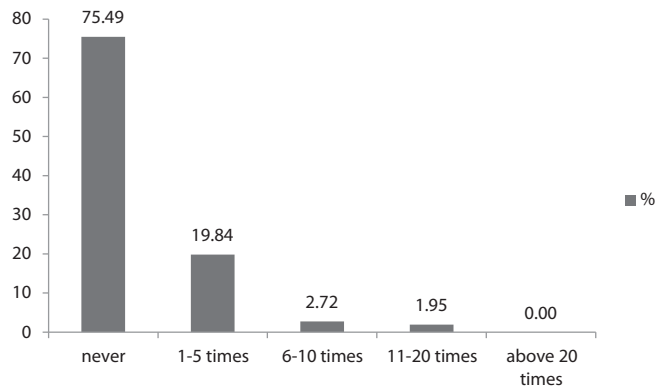


Fig. 5. Responders' answers to the question: How many times did You face an attempt at forcing You to produce a prescription for a medication that might have served as PES?

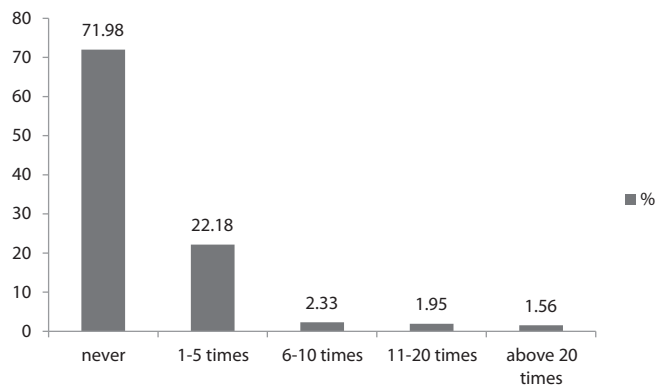


Fig. 6. Responders' answers to the question: How many times did You meet a patient suffering from adverse side effects resulting from using PES?

Almost one-third of the physicians (28.79%) declared that in their professional practice they experienced a contact with a patient manifesting adverse side effects resulting from using substances recognized as performance-enhancing.

Subsequently, the responders were asked about the frequency of the above-mentioned situations. Their responses are presented in Fig. 4–6.

Discussion

Almost all the physicians participating in the study regarded the use of PES to constitute unethical behavior, what agrees with the provisions of the Medical Ethics Code and the Sports Medicine Ethics Code. On the contrary, in the study carried out in the United Kingdom in the nineties of the last century, as many as 12% of physicians were of the opinion they might prescribe anabolic steroids for non-medical indications [12]. When placed side by side, these two results illustrate the increasing awareness and change in physicians' attitude towards PES that occurred over the past years.

In earlier investigations, the physicians-responders recognized the use of PES a public health-related problem [17, 18]. In this context, fighting doping seems to be a significant issue. Almost 86% of the responders believed that a health care sector professional should take part in countermining the phenomenon of doping in sports. Similar results (89%) were achieved by Laure *et al.* [13] in their investigations carried out in France. A somewhat lower percentage of responders (78%) gave positive answers in the studies performed in India by Kulkarni *et al.* [14] and in Slovenia by Auersperger *et al.* (69%) [15]. The highest willingness to be involved in anti-doping activity were demonstrated by physicians from Ireland (92%) [16].

POLADA is an organization which is responsible for program of anti-doping controls and educational actions in Poland [4]. According to annual report, 3282 anti-doping tests was made in 2016 [26]. In the available published analyses, the responders considered activities employed to counteract doping to be insufficient [15–17]. Therefore, in the present questionnaire, the authors asked the physicians about their opinions on methods of fighting doping. The investigated physicians declared disqualification of the contestants to be the most effective method. Anti-doping education combined with providing necessary information to sportsmen were selected by a low number of the responders, in contrast to the studies of Dikic *et al.*, where this method was chosen by 70% of physicians, who at the same time emphasized the key role of educating young sportsmen. In the Balkan study, there was also stressed the beneficial effect of preventive activities on health-associated risks, sports ethics and the risk of addiction [17]. Similar results were also achieved by Laure *et al.* [13]. In the opinion of the above researchers, the method seemed to be essential in long-term countermining doping. POLADA realizes educational

programs, which are directed to various groups — from professional athletes, their coaches and medical staff to school students [4]. One of these projects „Gram Czysto — Fair Play”, directed to young athletes, was realized in 2016 [26].

In the present study, more than 40% of the responders declared that during their professional practice they met the issue of doping. In studies carried in other countries, the percentage ranges from 28% to 80% [13, 15–17, 19]. The results illustrate considerable differences between countries. Such disparities may partly be a consequence of the fact that in some questionnaires the authors limited the question to contacts with doping within the past 12 months only [13, 15, 17, 19].

In the present analysis it is worth mentioning that in almost two-thirds of the cases the issue of doping was mentioned on patient’s initiative. At the same time, less than one-half of the responders regarded their knowledge of problems related to doping as sufficient when considered in the light of the above-mentioned situations. A similar level of responses was presented by physicians from Australia [19]. In the reports by Laure et al and Woods *et al.*, physicians demonstrated a much worse opinion on their level of knowledge addressing the issue of PES [13, 16]. According to Laure *et al.*, as many as 77% of the study subjects felt they were poorly prepared to carrying out anti-doping activities [13]. In the report by Woods *et al.*, only 9% of the responders confirmed their being prepared to fulfil the role [16]. Such results illustrate the need of carrying out educational programs addressing PES for physicians representing various specialties. An additional factor in favor of organizing such training courses is the continuously growing popularity of PES.

According to the responses given by the Polish physicians, at the foreground of information offered to the patient while discussing doping is the issue of health-related consequences of using PES. This fact is also confirmed by earlier reports [13, 17]. The issue seems to be of importance in view of the estimated high incidence of adverse side effects following PES usage, as well as the fact that the spectrum of ASE is highly extensive and therefore, the problem may be faced by physicians representing numerous specializations [6]. In the present study, almost one-third of the responders declared that in their professional life, they experienced a contact with a patient suffering from adverse side effects resulting from using PES; the fact is confirmed in the report by Dikic *et al.* [17]. In addition, approximately $\frac{1}{4}$ of the present responders suggested consultations of sports medicine specialists or presented safe alternatives for PES. In the reports published to date, the issue of the physician’s reaction to questions on PES posed by the patients was not mentioned.

The presently described questionnaire demonstrated that every fourth responder experienced a direct attempt at forcing him to prescribe a medication that might have been used as PES. A similar percentage of responses was achieved by Dikic *et al.* The said authors also drew attention to groups of medications that were involved

in such situations: AAS, corticosteroids and beta 2 agonists [17]. According to Greenway *et al.*, a not much lower percentage of the responders (18%) were asked to prescribe AAS [12]. On the other hand, in the study carried out by Kulkarni *et al.* among Indian physicians, none of the responders did admit he had been asked for a prescription for PES [14]. Possibly, such a difference resulted from the fact that the latter study was performed on another continent presenting different culture.

Taking into consideration the popularity of PES and the estimated incidence of ASE associated with the use of PES [6], one may conclude that many people do not consult physicians with respect to using such substances. Such a situation may be affected by lack of confidence in physicians exhibited by PES users. The problem was investigated by Pope *et al.* [11]. Eighty weight-lifters (43 AAS users, 37 non-users) participated in the study. Both groups held in high regard the competence of physicians with respect to general health, alcohol consumption or quitting smoking. However, the physicians were not highly regarded with respect to their knowledge on AAS. The investigators demonstrated that 40% of PES users trusted information provided by their dealers to the same degree as they trusted information coming from the physicians. At the same time, 56% of the investigated subjects never consulted a physician with respect to using PES [11]. The results demonstrate that PES users must necessarily increase their trust in doctors' competences to allow physicians to carry out anti-doping activities.

Conclusion

The present study was the first investigation in Poland that focused on issues pertaining to PES considered in the aspect of daily medical practice. As it has been demonstrated, Polish physicians regard using PES as unethical behavior, at the same time emphasizing that a health care system professional should participate in counteracting the phenomenon of doping in sports.

Physicians — irrespectively of their specialty — are also exposed to PES-related problems in their daily practice. Some physicians were asked to write prescriptions for a medication that might be used as PES. Almost one-third of the responders declared that in their practice, they encountered a patient manifesting PES adverse side effects. Since substances employed as PES show a wide spectrum of ASE, the problem may affect physicians representing a high number of specialties. At the same time, only less than one-half of the responders believed their knowledge on doping to be sufficient. Such considerations indicate a need for educational programs focusing on PES to be offered to physicians representing various specialties.

As it is demonstrated by results obtained by previous authors, for physicians to carry out anti-doping activities it is necessary to improve their image in the community of PES users.

Fulfilling this requirement combined with extending the knowledge on PES in physicians will allow for offering even better help and care to the patients.

Limitations

Since this was the first study in Poland addressing the issues of PES analyzed in the aspect of every-day medical practice, the group size was small.

The responders filled out the questionnaire on their own, what might have resulted in some inaccuracies.

The study may be encumbered with an error resulting from the obtained percentage of answers (75.81%).

The questionnaire did not address all the issues associated with the problem of doping.

Funding

None.

Conflict of interest

None declared.

References

1. *Reardon C.L., Shane Creado S.*: Drug abuse in athletes. *Subst Abuse Rehabil.* 2014; 5: 95–105.
2. *Mazzeo F, Ascione A.*: Anabolic androgenic steroids and doping in sport. *Medicina Sportiva.* 2013; 9 (1): 2009–2020.
3. <https://www.wada-ama.org/> [cited 2018 September 08].
4. <https://www.antydoping.pl> [cited 2018 September 08].
5. The World Anti-Doping Code: Prohibited List January 2018.
6. *Ambrose P.J., Tsourounis C., Olander R., Uryasz F.*: Characteristics of drug and dietary supplement inquiries by college athletes. *Sports Health.* 2010; 2 (1): 12–18.
7. *Baron D.A., Martin D.M., Magd S.A.*: Doping in sports and its spread to at-risk populations: an international review. *World Psychiatry.* 2007; 6: 118–123.
8. *Wiefferink C.H., Detmar S.B., Coumans B., Vogels T., Paulussen T.G.W.*: Social psychological determinants of the use of performance-enhancing drugs by gym users. *Health Educ Res.* 2008; 1: 70–80.
9. *Mędraś M., Józków P.*: Zastosowanie testosteronu i steroidów androgenno-anabolicznych w sporcie. *Endokrynol Pol.* 2009; 3: 204–209.
10. *Sas-Nowosielski K.*: Motywy podejmowania ćwiczeń na siłowni oraz wiedza na temat metod wspomaganiania wśród osób stosujących i niestosujących dopingu steroidami anaboliczno-androgennymi. *Zeszyty Metodyczno-Naukowe AWF Katowice.* 2005; 19: 127–135.
11. *Józków P., Mędraś M.*: Hormon wzrostu i IGF-1 jako substancje dopingujące w sporcie wyczynowym. *Endokrynol Pol.* 2009; 5: 389–394.

12. Holt R.I.G., Sonksen P.H.: Growth hormone, IGF-I and insulin and their abuse in sport. *BJP*. 2008; 15: 542–556.
13. Peters C., Schultz T., Michna H.: Biomedical Side Effects of Doping. Project of the European Union, Verlag SPORT und BUCH Strauß. Köln 2002.
14. Yesalis Ch.E., Bahrke M.S.: Doping among adolescent athletes. *Bailliere's Clinic Endocrin and Metab*. 2000; 1: 25–35.
15. Kodeks Etyki Lekarskiej, Nadzwyczajny VII Krajowy Zjazd Lekarzy, Toruń, 2003, art. 75.
16. Kodeks Etyczny Medycyny Sportowej 1997.
17. Pope H.G., Kanayama G., Ionescu-Piooggia M., Hudson J.I.: Anabolic steroid users' attitudes towards physicians. *Addiction*. 2004; 99 (9): 1189–1194.
18. Greenway P., Greenway M.: General practitioner knowledge of prohibited substances in sport. *Br J Sports Med*. 1997; 31: 129–131.
19. Laure P., Binsinger C., Lecerf T.: General practitioners and doping in sport: attitudes and experience *Br J Sports Med*. 2003; 37: 335–338.
20. Kulkarni K.: Medical Doctors and Doping in Sports — Awareness, Knowledge and Attitudes. Presented at the 29th FIMS World Sports Medicine Congress — Beijing, China, 2006.
21. Auersperger I., Topič M.D., Maver P., Pušnik V.K., Osredkar J., Lainščak M.: Doping awareness, views, and experience: a comparison between general practitioners and pharmacists. *Wien Klin Wochenschr*. 2012; 124: 32–38.
22. Woods C.B., Moynihan A.: General practitioners knowledge, practice and training requirements in relation to doping in sport. *Ir Med J*. 2009; 102 (1): 8–10.
23. Dikic N., Ionescu A., Dimitrova D., Natsis K., Ergen E., Suzic J.: Medical doctors and doping in sport: attitudes and experience in Balkan region. *Medicina Sportiva*. 2008; 14: The 15-th Sports Medicine Balkan Congress.
24. Dièye A.M., Diallo B., Fall A., Ndiaye M., Cissé F., Faye B.: Doctors belonging to the Senegalese Association of Sport Medicine and doping in sports: survey on knowledge and attitudes. *Sante*. 2005; 15 (3): 167–170.
25. Gupta L., Towler B.: General practitioners' views and knowledge about anabolic steroid use: Survey of GPs in a high prevalence area. *Drug and Alcohol Rev*. 1997; 16: 373–379.
26. Antydoping Polska: Raport Roczny 2016.