

DOPING AGENTS

IN SOME RACQUET SPORTS

A Review of Literature

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Abstract

The current research aims at identifying the types of prohibited doping agents prevalent in racquet sports, namely tennis, table tennis and squash through a critical review of studies published in that field. The researchers used the descriptive (analytical) approach to review the related literature of doping agents in racquet sports. The researchers restricted their review to research studies published from 2003 to 2012 on “Doping in Racquet Sports”. The total number of studies related to “doping in Sports” was (12435) studies. The total number of studies related to “doping in Racquet Sports” was (1393) studies. The total number of studies related to “doping in tennis, squash and table tennis” was (58) studies. According to results and discussion, the researchers concluded the following:

- Doping agents are prevalent in racquet sports.*
- There is a major lack of studies dealing with doping agents in racquet sports.*
- The least sport that is studied in relation to doping agents is squash.*
- The most prevalent agents in racquet sports are Narcotics (Pain Killers), Cannabinoids, Anabolic Modulators, Stimulants, Hormones and Growth Factors.*
- Most studies dealt with junior players and the least sample used in such studies were elite sample.*
- Most studies dealt with the side effects of doping agents while testing came second and prevalence of doping agents came last.*

Background:

According to Orchard et al (2006) certain drugs have the potential to increase athletic performance, but they carry the risk of side effects, which may include death and life-long morbidity. Examples include a cyclist dying from stimulant misuse during the 1960 Rome Olympics, and deaths from cardiovascular disease and various cancers resulting from use of anabolic steroids, as well as the permanent androgenizing effects of these drugs, including infertility, which affect many female athletes. Prohibitions on the use of dangerous performance-enhancing drugs have been introduced in almost all elite-level sports over the past 4 decades. Anti-doping laws attempt to minimize the numbers of athletes engaging in doping. (41)

The World Anti-Doping Agency (WADA) is responsible for developing and implementing uniform anti-doping standards worldwide (both with respect to lists of banned drugs and penalties for misusing them). The World Anti-Doping Code ("WADA Code") was adopted after consultation with governments, sporting bodies, national anti-doping agencies and other relevant parties in 2003 by all Olympic Committees, many nations and many elite sports associations. A substance can be included on the World Anti-Doping Code Prohibited List if it meets two of the three major criteria defined by WADA, or if it is a potential masking agent. The three criteria are that the substance is performance-enhancing, that there are health risks to the athlete with use of the substance and that use of the substance violates the spirit of sport. (14)

Athletes may use drugs for one of three main reasons: Inadvertent (or alleged inad-

vertent) consumption in a propriety medicine, Deliberate consumption for misuse as a recreational drug and Deliberate consumption to enhance performance. Stimulants may be taken to increase alertness or convey some psychological motivational or attitude advantage from central actions. Peripheral actions may increase performance at least in the early stage of exercise by increasing cardiac output, increasing blood flow to muscles and by mobilizing energy. A warm-up prior to strenuous exercise results in increased blood flow to the exercising muscle and to cardiac muscle, warming of the body by transferring heat from the exercising muscles into the bloodstream, a warming that will also aid oxygen uptake by the tissues (oxygen dissociation curve for hemoglobin shifts to the right), and sweating for temperature regulation. Some or all of these effects can be mirrored by agents, which stimulate the cardiovascular system and particularly the heart. (11)

According to WADA and The International Olympic Committee, the following substances are prohibited: Alcohol, Beta Blockers, Anabolic Agents, Peptide Hormones, Growth Factors, Beta-2 Agonists, Hormone and Metabolic Modulators, Selective estrogen receptor modulators (SERMs), anti-estrogenic substances, Agents modifying myostatin function(s), Metabolic modulators, Diuretics and Masking Agents, Stimulants, Narcotics, Cannabinoids and Glucocorticosteroids. (55, 61)

The side effects of using doping agents are numerous and the severity of these side effects depends on the type of the agent, dosage and duration of usage. These side effects include sudden death due to cardiac arrest, quitting the game altogether due to

permanent defect in muscles, joints and ligaments (due to the use of anabolic steroids or even pain killers) and various psychological side effects that affect the mental health of the athlete (43).

In addition, in its code for banning doping agents, The World Anti-Doping Agency (WADA) indicates that most doping agents are banned not only in competitions, but also during training as its side effects may hinder the athlete's abilities to perform well in training and in competition as well (61).

The prevalence of using these substances represents a major problem in the sports field and many researcher efforts try to identify its prevalence and side effects in most sports activities. The current study is a try to identify the prevalence of prohibited substances and their side effects in racquet sports, namely tennis, table tennis and squash.

Aim:

The current research aims at identifying the types of prohibited doping agents prevalent in racquet sports, namely tennis, table tennis and squash through a critical review of studies published in that field.

Research questions:

1. Through the review of literature, how far are doping agents prevalent in some racquet sports (tennis – squash – table tennis)?
2. Through the review of literature, what are the doping agents prevalent in some racquet sports (tennis – squash – table tennis)?

Methods:

Approach:

The researchers used the descriptive (analytical) approach to review the related literature of doping agents in racquet sports.

Sample:

The researchers restricted their review to research studies published from 2003 to 2012 on "Doping in Racquet Sports". The total number of studies related to "doping in Sports" was (12435) studies. The total number of studies related to "doping in Racquet Sports" was (1393) studies. The total number of studies related to "doping in tennis, squash and table tennis" was (58) studies. (1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,42,43,45,46,47,48,49,50,51,52,53,54,56,57,58,59,60)

Research tools:

The researchers used "Google search engine" to gather data. Data was analyzed using a content analysis form (prepared by the researchers).

Statistical treatments:

The researchers used SPSS software to calculate the frequency and percentage values.

Date of analysis:

The researchers gathered data from 15-8-2012 to 17-8-2012. Data was analyzed from 18-8-2012 to 16-9-2012. Statistical treatments were performed on 17-9-2012.

Results:

Table (1):

Frequency and Percentage of Doping Studies in racquet Sports out of Total Studies of doping in Sports Published from 2003 to 2012

Type of Studies	Frequency	Percentage
Doping in Sports	12435	100%
Doping in Racquet Sports	1393	11.202%

Table (2):

Frequency and Percentage of Doping Studies in racquet Sports Published from 2003 to 2012 according to the type of publication

Type of Studies	Frequency	Percentage
News letters and articles	1056	75.808%
Research studies	320	22.972%
Research projects	17	1.220%
Total	1393	100%

Table (3):

Frequency and Percentage of Doping Studies in racquet Sports Published from 2003 to 2012 according to the type of Doping Agents

Doping Agents	Frequency	Percentage
General	100	7.179%
Alcohol	59	4.235%
Beta Blockers	55	3.948%
Anabolic Modulators	62	4.523%
Peptide Hormones	22	1.579%
Growth Factors	58	4.164%
Hormones	46	3.302%
Beta 2 Agonists	88	6.317%
Metabolic Modulators	31	2.225%
Diuretics and Masking Agents	761	54.630%
Stimulants	267	19.167%
Narcotics (Pain Killers)	223	16.009%
Cannabinoids	189	13.568%
Glococortisteriods	31	2.225%
Total	1393	100%

Table (4):

Frequency and Percentage of Doping Studies related to racquet Sports (Tennis – Squash – Table Tennis) out of Total Studies of doping in Sports Published from 2003 to 2012

<i>Type of Studies</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Doping in Sports</i>	<i>12435</i>	<i>100%</i>
<i>Doping in Racquet Sports (tennis – squash – table tennis)</i>	<i>58</i>	<i>0.446%</i>

Table (5):

Frequency and Percentage of Doping Studies related to racquet Sports (Tennis – Squash – Table Tennis) out of Total Studies of doping in Racquet Sports Published from 2003 to 2012

<i>Type of Studies</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Doping in Racquet Sports</i>	<i>1393</i>	<i>100%</i>
<i>Doping in Racquet Sports (tennis – squash – table tennis)</i>	<i>58</i>	<i>4.163%</i>

Table (6):

Frequency and Percentage of Doping Studies related to each racquet Sport (Tennis – Squash – Table Tennis) out of Total Studies of doping in Racquet Sports Published from 2003 to 2012

<i>Type of Studies</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Tennis</i>	<i>39</i>	<i>67.242%</i>
<i>Squash</i>	<i>2</i>	<i>3.448%</i>
<i>Table tennis</i>	<i>17</i>	<i>29.448%</i>
<i>Doping in Racquet Sports (tennis – squash – table tennis)</i>	<i>58</i>	<i>100%</i>

Table (7):

Frequency and Percentage of Doping Studies in racquet Sports (Tennis – Squash – Table Tennis) Published from 2003 to 2012 according to the type of Doping Agents

Doping Agents	Frequency	Percentage
<i>Anabolic Modulators</i>	<i>11</i>	<i>18.966%</i>
<i>Hormones</i>	<i>6</i>	<i>10.345%</i>
<i>Growth Factors</i>	<i>6</i>	<i>10.345%</i>
<i>Stimulants</i>	<i>11</i>	<i>18.966%</i>
<i>Narcotics (Pain Killers)</i>	<i>12</i>	<i>20.690%</i>
<i>Cannabinoids</i>	<i>12</i>	<i>20.690%</i>
Total	58	100%

Table (8):

Frequency and Percentage of Doping Studies related to racquet Sports (Tennis – Squash – Table Tennis) Published from 2003 to 2012 according to the aim of each study

Type of Studies	Frequency	Percentage
<i>Side effects</i>	<i>28</i>	<i>48.276%</i>
<i>Testing</i>	<i>16</i>	<i>27.586%</i>
<i>Prevalence</i>	<i>14</i>	<i>24.138%</i>
Total	58	100%

Table (9):

Frequency and Percentage of Doping Studies related to racquet Sports (Tennis – Squash – Table Tennis) Published from 2003 to 2012 according to the type of sample

Type of Studies	Frequency	Percentage
<i>Elite sample</i>	<i>9</i>	<i>15.517%</i>
<i>Junior sample</i>	<i>21</i>	<i>36.207%</i>
<i>Recreational sample</i>	<i>12</i>	<i>20.690%</i>
<i>Elderly sample</i>	<i>16</i>	<i>27.586%</i>
Total	58	100%

Discussion:

Table (1) indicates that the total number of studies published on doping in sports from 2003 to 2012 is (12435). The number of studies related to doping in racquet sports is (1393). Out of these (1393) studies, there were (1056) news letters and articles, (320) research studies and only (17) research projects (table 2). This indicates a major lack in studies related to doping in racquet sports.

Table (3) indicates that the most studied doping agents were diuretics and masking agents with (761) studies out of (1393) studies (54.63%) while peptide hormones came last with only (22) studies out of (1393) studies (1.579%).

The number of studies that dealt with tennis, squash and table tennis was only (58) studies; that is (0.446%) of total studies dealing with doping in sports (table 4) and (4.163%) of total studies dealing with doping in racquet sports (table 5). This clearly indicates a need for more studies in these specific sports as these percentages are relatively very low compared to other sports.

In addition, table (6) indicates that only (39) studies dealt with tennis, (2)

studies dealt with squash and (17) studies dealt with table tennis. This indicates that squash was the least considered sport in this type of research work.

Table (7) indicates that studies related to tennis, squash and table tennis dealt only with six types of doping agents. These agents are Narcotics (Pain Killers) and Cannabinoids (12 studies each) (20.690% each), Anabolic Modulators and Stimulants (11 studies each) (18.966%) and Hormones and Growth Factors (6 studies each) (10.345% each).

Table (8) indicated that (28) studies out of (58) dealt with the side effects of doping agents on racquet sports players while (16) studies dealt with testing procedures to discover such agents and (14) studies dealt with the prevalence of doping agents among racquet sports players.

Table (9) indicated that (21) studies out of (58) were performed on junior racquet sports players, (16) studies were performed on elderly people who play racquet sports, (12) studies were performed on recreational racquet sports players and only (9) studies were performed on elite racquet sports players.

Conclusions

According to results and discussion, the researchers concluded the following:

Doping agents are prevalent in racquet sports.

There is a major lack of studies dealing with doping agents in racquet sports.

The least sport that is studied in relation to doping agents is squash.

The most prevalent agents in racquet sports are Narcotics (Pain Killers), Cannabinoids, Anabolic Modulators, Stimulants, Hormones and Growth Factors.

Most studies dealt with junior players and the least sample used in such studies were elite sample.

Most studies dealt with the side effects of doping agents while testing came second and prevalence of doping agents came last.

Recommendations

The researchers recommend the following:

It is necessary more research effort on doping in racquet sports, especially in squash.

WADA policies and directives should be introduced to coaches and players of racquet sports, especially juniors, to help protecting them for the dangers of doping side effects.

More studies are needed on the side effects of doping agents on training and competition for racquet sports player, especially tennis, squash and table tennis.

It is necessary to perform a field study about the reality of doping prevalence among racquet sports players in Egypt.

It is important to hold seminars for coaches to introduce the dangers of doping agents, in cooperation with national racquet sports federations.

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