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Prevalence, knowledge, and practice of oestrogen use among the male gym participants

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RESEARCH

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ABSTRACT

Background

Oestrogen is the primary female sex hormone and has important functions in both female and male physiology. It also seems that many athletes want to achieve results in shorter times with less effort.

Aims

This study assesses the prevalence of oestrogen use among male gym patrons in Saudi Arabia, their knowledge related to oestrogen abuse, and the profiles of users.

Methods

A cross-sectional study was conducted from February 2017 to May 2017 and included 4860 male gym patrons. The participants were given a questionnaire with a total of 19 questions regarding socioeconomic information, knowledge and practices related to oestrogen, and lifestyle habits.

Results

The participants had a mean age of 28.6+6.2 years, 6.1 per cent of them abused oestrogen, and the most common forms used were ethinylestradiol (0.03mg) and drospirenone (3mg). Furthermore, 80.7 per cent of the users used it before exercise only. Breast enlargement was the main reason for oestrogen use, and local drug stores were the main source. Compared to non-users, oestrogen users were older (P=0.322), reported lower incomes (P=0.395), were more likely to be active smokers (P=0.597), and had a longer duration of gym participation (p<0.001).

Conclusion

The results indicate that 6.1 per cent of the surveyed male participants abused a combination of oestrogen and progesterone for breast enlargement, which was significantly more likely among males who had longer durations of gym participation.

Key Words

Oestrogen, gym, breast, hormone

What this study adds:

1. What is known about this subject?

This study provides new medical observation about the use of contraceptive drugs among gym participants.

2. What new information is offered in this study?

The abuse of illegal substance exceeds the use of anabolic steroids and growth hormone to oestrogen use.

3. What are the implications for research, policy, or practice?

More educational strategy involve people how attend the gym and more restriction about the medication to help limiting abuse those substance.

Background

Oestrogen is the primary female sex hormone and has important functions in the development of secondary female sex characteristics and the regulation of the female

reproductive system. However, oestrogen also has important functions in male physiology.[1,2] It is important for a wide range of regulatory functions in the cardiovascular and central nervous systems, bones, and carbohydrate and lipid metabolism in both females and males.[2-4]

Sources of oestrogen can be exogenous or endogenous.[3] The main sources in premenopausal women are the ovaries, while the main source in postmenopausal women and men is extra-gonadal tissues.[5] Clinically, oestrogen can be used for many clinical reasons, including hormonal replacement therapy, contraception, and prostate cancer.[1] Nevertheless, oestrogen is associated with various side effects, such as gynecomastia in men, increased incidence of breast and uterine cancer in women, and increased risk of thromboembolic disease.[1,4]

The use of substances such as growth hormone and anabolic androgenic steroids is increasing, and it appears that many athletes want to achieve their goals in a shorter time and with less effort. Many studies have investigated the usage of such drugs among athletes and gym attendees to enhance their performance or improve their body shape.[7] However, some well-known bodybuilder trainers have recently mentioned on their social media accounts that some trainees are using oestrogen to increase their breast size and performance.[8]

There are no previous studies on the prevalence of oestrogen abuse among male athletes. The purpose of this study is to investigate the prevalence of oestrogen abuse among male gym attendees in Saudi Arabia. We also assessed their knowledge related to oestrogen abuse along and the profiles of users.

Method

A cross-sectional study was conducted from February 2017 to May 2017 with 4,860 male gym participants. The participants attended more than 60 gyms and sport centres, which are distributed among the five major geographic regions of Saudi Arabia. Any male gym participant who was willing to participate was included in this study. A group of medical students distributed a questionnaire to gym participants to evaluate the knowledge and practices of oestrogen users. The students went to the gyms in person, helped explain the questionnaire to the participants, and collected the responses. Informed written consent was obtained from all participants.

The questionnaire consisted of single-response questions and one multiple-response question. The participants' age, weight, and height were also collected, which were self-reported by the participants and used to calculate the Body Mass Index (BMI). Furthermore, baseline characteristics were collected, including socioeconomic information, education level, and smoking habits. The questionnaire included a total of 13 questions regarding the use of oestrogen substances. We assessed the prevalence of oestrogen usage, the source of information, the duration of use, the source of the substance, and the possible reasons for using oestrogen substances. We considered those with a monthly income of more than 5,000 Saudi Riyals as having moderate/high income.

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS, Version 22.0). Data are presented as the mean±standard deviations. The means and differences between subjects were compared using an independent t-test for quantitative data or a chi-square test for qualitative data. We considered a P value of 0.05 or less to be statically significant. This study was approved by the Ethical Review Committee of College of Medicine, Taif University, Taif, Saudi Arabia.

Results

A total of 4,860 gym participants were included in the study, and the mean age was 28.6+6.2 years. A majority of the participants had a bachelor's degree or higher. Almost half had moderate or high income and were either active or passive smokers. Furthermore, 27.6 per cent of the participants reported working in the medical field (Table 1). Personal interest was the most reported reason for joining a gym for those with a long duration of gym attendance. More than half used multivitamins or mineral supplements, while less than 10 per cent used growth hormone. Walking and playing soccer were the most common forms of physical activity (Table 1).

The abuse of oestrogen substances was reported by 6.1 per cent of the participants, and the most common form was a combination of oestrogen and progesterone in the form of the Yasmin tablet (ethinylestradiol (0.03mg)/drospirenone (3mg)). Social media was the main source of oestrogen-related information, followed by friends. Local drug stores were the main source of oestrogen substances for the trainees, and most of them started using it during the first 2 years of gym enrolment. Less than 12 per cent of the oestrogen users sought medical consultation. Most of the trainees used oestrogen before exercise only and not on a daily basis. Breast enlargement was the main reason for oestrogen use, followed by increased fitness.

Compared to the non-users, oestrogen users were older (P=0.322), less likely to be married (P=0.501), had comparable BMI (P=0.952), reported lower incomes (P=0.395), and were less likely to work in the medical field (P=0.334). They were also more likely to live in the central and eastern regions of Saudi Arabia, to be active smokers (P=0.597), to have a longer duration of gym participation (p<0.001), to use multivitamins (P=0.009), and to participate in walking and swimming activities (P=0.082).

Discussion

This study investigated the prevalence, knowledge, and practice of oestrogen use in Saudi Arabia among male gym participants. The prevalence of oestrogen users was 6.1 per cent. There is a lack of studies comparing the prevalence of oestrogen abuse, which may be a rising problem among athletes and should be investigated further. Oestrogen abuse may shortly become as prevalent as anabolic androgenic steroid abuse.

In a study conducted in the USA, 22 per cent of respondents reported using the selective oestrogen receptor modulator (SERM) tamoxifen, which is commonly used in breast cancer treatment. Bodybuilders used it to prevent excess effects of anabolic androgenic steroids, which aromatize to form oestrogen and cause gynecomastia (breast enlargement).[9] This could explain the most common reason for oestrogen abuse in our study. Also, elevated estradiol can cause painful breast enlargement in males, and tamoxifen is a known treatment. This may explain the popularity of tamoxifen abuse in previous studies.[5,10-12]

In the present study, 40.7 per cent of oestrogen users bought oestrogen from local drug stores, and 88.3 per cent of the users said that they did not use it under medical supervision or prescription, which leads us to believe that they buy it over the counter. Thus, easy accessibility to the drug may be a part of the problem. A study examining 147 countries found that oral contraceptive pills were legally available without prescription in 24 per cent of those countries and informally available without a prescription in 38 per cent.[13] Our study limitations were that the questionnaire was self-reported and did not include a profile of oestrogen complications. The strengths are the large sample size and novelty of the research.

Conclusion

Among surveyed male participants, 6.1 per cent abused a combination of oestrogen and progesterone for breast enlargement, which was significantly more likely among males who had longer durations of gym participation.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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ETHICS COMMITTEE APPROVAL

This study was approved by the Ethical Review Committee of College of Medicine, Taif University, Taif, Saudi Arabia.

Tables

Table 1: Baseline characteristics for the whole cohort

Baseline characteristics	
Mean age (yrs)	27.6±7.2
Mean BMI (kg/m^2)	26.0±4.1
Married (%)	38.4
High school graduate or less (%)	26.2
Low income (%)	49.9
Working in the medical fields (%)	27.6
Living in Central region of Saudi (%)	44.1
Living in Eastern region of Saudi (%)	16.1
Living in Western region of Saudi (%)	22.3
Living in North region of Saudi (%)	7.3
Living in Southern region of Saudi (%)	10.2
Active smokers (%)	30.0
Passive smokers (%)	22.2
Gym/Physical activities related data	
Participated in gym for health reasons	20.4
Participated in gym for social reasons	9.2
Participated in gym for personal reasons	70.4
Duration of gym participation (months)	30.1±31.9
Average weekly gym training (hours)	7.3±4.6
Participants who believed that it is legal to use AAS (%)	53.5
Use of multivitamin/mineral supplements (%)	58.9
Use of growth hormone (%)	7.4
Participated in walking related exercise (%)	33.7
Participated in running related exercise (%)	15.5
Participated in swimming related exercise (%)	21.0
Participated in soccer related exercise (%)	29.8

Table 2: oestrogen use data

Oestrogen data	
Ever used oestrogen related substance (%)	6.1
Friend as a source of information about oestrogen (%)	36.7
Gym trainer as a source of information about oestrogen (%)	20.8
Social media as a source of information about oestrogen (%)	42.5
Participant uses oestrogen daily (%)	19.3
Participant uses oestrogen before exercise only (%)	80.7
Oestrogen usage during the 1st gym year (%)	41.0
Oestrogen usage during the 2nd gym year (%)	27.1
Duration of oestrogen usage (months)	16.7+13.6
Gym trainer provided participant with the oestrogen substance (%)	24.7
Friends provided participant with the oestrogen substance (%)	22.9
Participant buys the oestrogen from local drug stores (%)	40.7
Participant uses oestrogen under medical supervision (%)	11.7
Breast enlargement as a reason of oestrogen usage (%)	76.8
Fitness as a reason for oestrogen usage (%)	50.7

Table 3: Groups based on oestrogen usage

Baseline characteristics	Oestrogen users	Non-Oestrogen users	P value
Number of participants (%)	298 (6.1)	4562 (93.9)	n/a
Mean age (yrs)	28.0±6.7	27.6±7.2	0.322
Mean BMI (kg/m^2)	26.0+4.4	26.0+4.0	0.952
Married (%)	59.7	61.7	0.501
High school graduate or less (%)	28.5	26.0	0.336
Low income (%)	48.3	50.0	0.395
Working in the medical fields (%)	25.1	27.7	0.334
Living in Central region of Saudi (%)	63.4	42.7	<0.001
Living in Eastern region of Saudi (%)	16.4	16.0	
Living in Western region of Saudi (%)	14.1	22.9	
Living in North region of Saudi (%)	4.0	7.6	
Living in Southern region of Saudi (%)	2.0	10.8	
Active smokers (%)	32.5	29.8	0.597
Passive smokers (%)	21.1	22.3	
Gym/Physical activities related data			
Participated in gym for health reasons	19.5	20.4	0.921
Participated in gym for social reasons	9.4	9.2	
Participated in gym for personal reasons	71.1	70.4	
Duration of gym participation (months)	39.0±35.7	29.5±31.6	<0.001
Average weekly gym training (hours)	7.3±5.2	7.3±4.5	0.755
Use of multivitamin/mineral supplements (%)	66.1	58.4	0.009
Use of growth hormone (%)	29.5	6.0	<0.001
Participated in walking related exercise (%)	39.3	33.3	0.082
Participated in running related exercise (%)	13.2	15.7	
Participated in swimming related exercise (%)	22.5	20.9	
Participated in soccer related exercise (%)	25.2	30.1	