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## Frequency of Anabolic Steroids Abuse in Bodybuilder Athletes in Kerman City<sup>†</sup>

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### Background:

### Abstract

Athletes, especially bodybuilders, abuse anabolic steroid drugs to improve their strength and enhance their muscle growth and appearance. This study was conducted to determine the type and frequency of anabolic steroids abuse in bodybuilder athletes in Kerman City.

### Methods:

A confidential questionnaire which included demographic data (age, education), name of abused anabolic drug and duration of drug abuse was completed by 202 bodybuilder athletes, and the collected data were analyzed using Chi Square test. A value of  $p < 0.05$  was considered significant.

### Findings:

The frequency of anabolic steroid abuse was 18.8%. The mean period of bodybuilding activity was significantly higher in those used the anabolic drugs (38.8 months), comparing to those did not use any drugs (14.3 months). Oxymetholone was the most common drug used by athletes (42% merely used Oxymetholone). The frequency of anabolic steroids abuse was not related to education and age of the bodybuilder athletes.

### Conclusion:

Bodybuilder athletes in Kerman city abuse anabolic steroids, and the health care system should plan to inform them about anabolic steroid adverse effects.

### Key words:

**Anabolic steroid, Bodybuilder athletes, Drug abuse**

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## Introduction

Seeking for ways to increase the speed and quality of bodily strength and activities has been a tendency for centuries. These ways include taking drugs. Doping in sports is referred to intentional or unintentional use of drugs which falsely increase the power and strength of the competitors and is considered an illegal and immoral act.<sup>1-3</sup>

Anabolic steroids have been used by athletes and non athletes for past four decades. In sports and bodybuilding, it is used to enhance strength or physique.<sup>3-8</sup> The tendency to use anabolic steroids has been seen in different age groups from teenagers to adults.<sup>4,9-14</sup>

Different studies show that therapeutic doses of anabolic steroids have no effect on muscle strength and athletes' performance, but the bodybuilders use 10 to 50 times of therapeutic doses.<sup>15-17</sup>

This dosage increases the power and muscle strength in one hand, but it causes hormonal disorder and other complications on the other hand.<sup>1</sup> Long term use of anabolic steroid drugs may lead to various complications including high risk of heart attack, cardiac arrest, sudden death, behavioral disorders such as aggressiveness, paranoid psychosis, prostate hypertrophy, liver cancer, and elevated hepatic enzymes.<sup>18-24</sup>

Sudden cardiac death of two soccer players in the age of 18 and 24 years and a 20-year-old bodybuilder following long-term use of anabolic steroids are examples of the cardiac complications of these drugs.<sup>10,25</sup>

There have been many reports indicating anabolic steroid abuse in bodybuilding clubs in Kerman so that authorities called for educational sessions to provide information for many families and relatives of the bodybuilders who ask about side effects of these drugs. The present study aimed to determine the frequency of the anabolic steroids abuse among the bodybuilders in Kerman, Iran in the first phase and then based on the findings suggest interventions to inform both athletes and trainers about the complications and potential risks.

## Methods

The aim of this cross sectional study was to estimate the frequency of anabolic steroids abuse among bodybuilders in Kerman City. First, a confidential questionnaire was prepared and a

primary study was conducted to estimate the sample size. The results showed a 20 percent abuse rate. Considering the 15 percent frequency rate, 95 percent confidence interval (CI) and 5 percent error, the sample size was calculated 196 and for more accuracy we increased it to 202 bodybuilders in Kerman City.

The questionnaire was completed by bodybuilders of 15 randomly selected clubs after the permission of the Physical Education Organization. The clubs were selected randomly and the 15 bodybuilders were randomly selected from each club to complete the questionnaire. The total number of completed questionnaire was 202.

The questionnaire was completed by bodybuilders before leaving the club. Personal data such as name was not included in the questionnaire, assuring confidentiality of data. Demographic questions included age, education and duration of exercise and the rest of questionnaire was related to the kind of anabolic steroids drugs they use, how they learned about anabolic steroids (through friends, trainers or other methods), how they obtain the drugs and the duration of usage. All the participants were cooperative. Participants with at least one month of continuous use were considered as anabolic steroid abusers. All collected data were analyzed using chi square test and a P value < 0.05 was considered significant.

## Results

From 202 bodybuilders who participated in this study 38 (18.8%) had used anabolic steroid drugs and 164 (81.2 %) had not used any kind of these drugs.

The participants were categorized into the following age groups: under 20, 20-24, 25-29 and over 29. The lowest abuse rate was in over 30 years of age group and the highest rate was in the 20-24 and 25-29 years old groups. There was no significant relation between age and abuse rate ( $P = 0.32$ ). Also, there was no significant relation between mean age of the abusers ( $24.4 \pm 5$  years) and non-abusers ( $25 \pm 7.2$  years) (Table1).

Participants were also divided into four groups according to their education level. These groups included non-educated, below high school diploma, diploma and Higher than high school diploma. Statistical analysis showed no significant relation between education level and the rate of anabolic steroids abuse (Table 2).

**Table 1.** The frequency of anabolic steroid abuse in different age groups of bodybuilders in Kerman city

Age groups (Year)	Total number of bodybuilders	Number of drug abusers	percentage of abusers in each group	percentage of abusers in total
Under 20	48	9	23.7	4.5
20-24	52	11	28.9	5.4
25-29	47	11	28.9	5.4
Over 29	55	7	18.5	3.5
Total	202	38	100	18.3

**Table 2.** The frequency of anabolic steroid abuse in terms of education levels among bodybuilders in Kerman city

Education	Total participants	Drug abuse	
		Number of drug abusers	percentage of drug abusers
Uneducated	14	0	0
Below Diploma	28	7	25
Diploma	114	23	20.1
Higher education	46	8	17.4
Total	202	38	18.8

**Table 3.** The frequency of anabolic steroid abuse and duration of exercising in bodybuilders in Kerman city

Drug abuse	Number of drug abusers	Mean of exercise duration (month)	SD	Exercising duration	
				Minimum period of abuse (Month)	Maximum period of abuse (Month)
Yes	38	38.8	29.6	2	72
No	164	14.3	12.2	0	<1

The findings on the period of abuse and duration of exercise were as follows; mean duration of bodybuilding exercise was 38.8 months in those taking anabolic steroids and 14.3 months in non-abusers, which showed a significant difference ( $P < 0.001$ ). The mean period of drug abuse in 38 bodybuilders who used anabolic steroids was 14.7 months with minimum 2 months and maximum 72 months (Table 3).

About 81.5% of the abusers obtained the drugs from black market, 5.2% obtained from drug stores without any prescription, and 13.2% with a prescription.

The findings showed that 60.5% of the bodybuilders were introduced to these drugs by their friends while 15.8% learned from their trainers and 23.7% learned from a physician.

Oxymetholone and Nandrolone were used by 42% and 29% of the bodybuilders, respectively and 23.7% of bodybuilders used a combination of two or more drugs (including Nandrolone, Oxymetholone, Methyl testosterone, Oxandrolone, Methenolone) and 5.3% used other drugs.

## Discussion

The most common pulmonary complication is the frequency of anabolic steroids abuse in Kerman

City was 18.8%. According to a study on bodybuilders conducted in Belgium from 1988 to 1993, the frequency of the anabolic steroids abuse was 35% to 58%,<sup>5</sup> which is much higher than the rate in Kerman City. The reason is not clearly known but it is possible that anabolic drugs are more known to Belgium bodybuilders or can be obtained easier. Also, bodybuilders in Kerman mainly exercise for health purposes while in Belgium they may intend to participate in sports competitions.

Anabolic steroids abuse is also common in weight lifters, soccer players, high school students and even among girls.<sup>4,9,13,14</sup> Nelson et al reported that 11% of American high school students abused anabolic steroid drugs and the rate of abuse was higher among students who were active in bodybuilding, weight lifting or other sports.<sup>11</sup>

Williamson et al reported that 4.4% of male high school students abused anabolic steroid drugs and most of them started at the age of 14-15 years.<sup>14</sup>

Another study reported that 6.6% of high school students in the USA abused anabolic steroids.<sup>4</sup>

The mean age of anabolic steroid abusers in this study was 24.4 years which is in agreement with Copeland et al study.<sup>9</sup>

There is no report on the frequency of anabolic steroid abuse in Iran; however, it is possible that the real rate of anabolic steroid abuse in Kerman City is higher than what we found in this study (18.8%), because not all the abusers admit it. False negative entries are an inevitable part of such studies and can only be reduced to some extent.<sup>3,13</sup> The study showed no significant relation between the amount of anabolic steroid abuse and the age and education level of bodybuilders ( $P = 0.35$ ,  $X^2 = 3.23$ ). Mean period of exercise was 38.8 months for anabolic steroid abusers, which is significantly higher than non-abusers (14.3 months) and it shows that the tendency to abuse is higher among sport professionals or those who have long-term bodybuilding exercise ( $P < 0.001$ ). Therefore, we may conclude that most abusers were long-term professionally exercising bodybuilders.<sup>2,12,13,23</sup>

Drugs were mostly obtained from black market (81.5%). Also, 13.2% obtained their drugs by physicians' prescription and 5.2% obtained from drugstores without any prescription, which suggest the need for supervising drug dispensing in pharmacies and stopping illegal activities. In a study conducted in the USA, 50% of the athletes obtained anabolic steroid drugs from black market and 50% obtained by a prescription.<sup>15</sup>

According to Buckley et al study in the USA, only 21% of anabolic steroid abusers obtained drugs by a prescription.<sup>4</sup> Also most anabolic steroid abusers in Britain obtained their drugs from black market, which is in agreement with the results of the present study.<sup>13,14</sup>

Some abusers use several oral drugs along with injecting a high dosage of drugs with long-term effects.<sup>8</sup> The most common anabolic steroid drugs abused by bodybuilders in Kerman included Oxymetholone (42.8%) and Nandrolone (29%), while Methenolone, Stanozolol and Oxandrolone are the most common abused drugs in other countries.<sup>5,22,23</sup> This can be due to the availability of different anabolic steroid drugs in different places.

The findings of this study showed that the main encouragement for anabolic steroid abuse comes from friends. This finding is in agreement with the results of other studies.<sup>21,26,27</sup>

Most studies show that majority of anabolic steroid abusers have no information about the side effects of these drugs and they mostly take them for muscle strength and good appearance.<sup>11,16,26,27</sup>

In addition to known complications of anabolic steroids including cardiac, endocrine, hepatic, pulmonary and central nervous system complications, these drugs can cause mood changes (depression, aggressiveness, paranoid, and violence), suicide, homicide, and drug dependency.<sup>9,18-20,22,25</sup>

Anabolic steroid abusers have also a tendency toward opiates. According to a study by Kanayama et al, out of 88 opium addicts 22 (25%) admitted to taking anabolic steroids previously and 29% admitted that they were introduced to opiates during their exercise sessions and the opium was provided to them from the same source that provided anabolic steroids<sup>11</sup>. It can be concluded that anabolic steroid abuse act as a gate to opium addiction.<sup>28</sup>

In summary, the results of this study suggest the need for educational programs to inform athletes about the side effects of anabolic steroids. Also, health care system should provide more information about adverse effects of anabolic steroids to bodybuilders and athletes. Athletes should be informed that sports are for increasing physical and mental health and it is both morally and socially illegal to use unethical means such as drugs to win a competition. They should also be informed that the efficacy of anabolic steroids to enhance muscle strength and performance among sexually mature people is not approved by studies.<sup>1</sup>

Factors responsible for the tendency toward anabolic steroid abuse include lack of emotional relation with father, childhood problems, appearance disapproval, low self-esteem, bodybuilding, weight lifting and history of alcohol and tobacco use.<sup>7,8,28,29</sup> Further studies should be conducted to determine the main factors responsible for the anabolic steroids abuse and suggest prevention strategies.

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## فراوانی استفاده نابه‌جا از داروهای استروئیدی آنابولیک در ورزشکاران رشته بدن‌سازی شهر کرمان

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### چکیده

ورزشکاران، به خصوص ورزشکاران رشته بدن‌سازی، داروهای استروئیدی آنابولیک را جهت افزایش توان و رشد عضلانی مصرف می‌کنند. این مطالعه جهت بررسی فراوانی میزان استفاده و نوع داروهای مصرفی در بین ورزشکاران رشته بدن‌سازی شهر کرمان طراحی گردید.

به منظور تعیین فراوانی مصرف داروهای استروئیدی آنابولیک پرسش‌نامه‌ای که محرمانه بودن اطلاعات در آن گوشزد گردیده بود، توسط ۲۰۲ نفر از ورزشکاران رشته بدن‌سازی شهر کرمان تکمیل گردید؛ سپس اطلاعات لازم شامل مشخصات دموگرافیک (سن و تحصیلات)، فراوانی مصرف دارو، نوع داروی مصرفی و مدت استفاده از داروهای مذکور استخراج و داده‌ها با کمک روش‌های آماری آنالیز شد.

فراوانی استفاده از داروهای استروئیدی آنابولیک در بین ورزشکاران رشته بدن‌سازی شهر کرمان ۱۸/۸ درصد به دست آمد. میانگین مدت زمان فعالیت ورزشی در افرادی که از دارو استفاده می‌کردند (۳۸/۸ ماه) به صورت معنی‌داری بالاتر از گروهی بود که از داروهای فوق استفاده نمی‌کردند (۱۴/۳ ماه). اکسی‌متولون پر مصرف‌ترین داروی مورد استفاده نابه‌جا بود؛ بدین معنی که ۴۲ درصد از ورزشکاران مصرف کننده داروهای استروئیدی آنابولیک تنها از اکسی‌متولون استفاده می‌کردند. فراوانی مصرف داروهای استروئیدی آنابولیک ارتباط معنی‌داری را با سن و تحصیلات ورزشکاران بدن‌ساز نشان نداد.

نتایج حاصل نشان دهنده مصرف نابه‌جای استروئیدهای آنابولیک توسط ورزشکاران رشته بدن‌سازی در شهر کرمان می‌باشد. لذا جهت حل این معضل مسؤولین دست‌اندرکار مسائل بهداشتی بایستی اطلاعات لازم را در رابطه با عوارض نامساعد و خطرات مصرف داروهای استروئیدی آنابولیک در اختیار ورزشکاران قرار دهند.

استروئیدهای آنابولیک، ورزشکاران بدن‌ساز، مصرف نابه‌جا

مقدمه:

روش‌ها:

یافته‌ها:

نتیجه‌گیری:

واژگان کلیدی:

تعداد صفحات: ۶

تعداد جدول‌ها: ۳

تعداد نمودارها: -

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