ODDS RATIO FOR USE OF ANABOLIC STEROIDS AND OTHER SUBSTANCES IN FITNESS TRAINING GYMS

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Resumo

Introdução e objetivo: O uso de agentes hormonais sem prescrição tem crescido largamente em diversos países entre atletas e especialmente entre não-atletas com intuito estético. Desta forma é relevante determinar que fatores levam a este abuso, pois este aumento também é visto entre a população mais jovem. **Métodos:** A Razão de Chance para consumo de agentes hormonais foi obtido através de um estudo longitudinal na cidade de Porto Alegre com 288 cultursitas recreacionais em 13 academias de ginástica sobre o consumo presente ou passado de agentes hormonais ou outras substâncias como suplementos alimentares, vitaminas e minerais, estimulantes e drogas ilícitas. **Resultados:** Os usuários de suplementos alimentares, vitaminas e minerais tiveram 6,45 vezes mais chances para uso de agentes hormonais que os não usuários. Usuários de drogas ilícitas tiveram 3,1 vezes mais chances para usar agentes hormonais que não usuários. Os usuários de estimulantes tem 2,54 vezes mais chances de usar agentes hormonais que não usuários. As possíveis explicações e fatores de risco para este abuso, como Vigorexia, Síndrome do Comportamento de Risco, o padrão polifarmácia dos culturistas, assim como os fatores de confusão para os achados sobre o risco relativo aumentados são discutidos. **Conclusão:** Sugerimos que estes achados definam pontos relevantes para estudos futuros sobre abuso de agentes hormonais, particularmente os esteróides anabólicos androgênicos e sua relação com os suplementos alimentares, estimulantes e drogas ilícitas.

Palavras-chave: Agentes anabólicos, Suplementos Alimentares, Usuários de drogas.

Abstract

Background: Hormonal agents for non-prescribed use has grown widespread in all nations, among athletes but especially non athletes for esthetics purposes. So it is relevant to determine the factors which lead to this abuse, since it has grown on younger population as well. **Methods:** Odds Ratio (OR) was obtained from a previous cross-sectional survey in the city of Porto Alegre, Brazil, with 288 recreational bodybuilders in 13 fitness training gyms about their current and past consumption of hormonal agents (HA), other substances such as dietary supplements, vitamins and minerals (SVM), stimulants (SL) and illicit drugs (ID). **Results:** The SVM users had OR of 6.45 times for HA consumption than non users. ID users had 3.10 times to use HA than non users. The SL users had 2.54 times the odds ratio for HA consumption than non users. The possible explanations and other risk factors for these abuse, like vigorexia, Risk Behavior Syndrome, the bodybuilder's polypharmacy pattern and the confounding factors for these OR are discussed. **Conclusion:** Thus far, it is suggested that these findings are able to define relevant starting points to future studies on hormonal agents abuse, particularly the anabolic androgenic steroids (AAS) and its relation with dietary supplements, stimulants and illicit drugs.

Key words: Anabolic Agents, Dietary Supplements, Drug Users.

INTRODUCTION

The use of anabolic androgenic steroids (AAS) is no longer exclusivity of competitive athletes and has been used by individuals who wish to improve their esthetics (1, 2). A study of 1955 non-prescribed AAS users showed that the reasons for the AAS abuse are muscle mass enhancement, strength gains and enhance the esthetic appeal (3), the same claims of dietary supplements labels.

The non-prescribed AAS abuse with esthetic purpose is growing, so it is necessary to understand which factors could drive recreational bodybuilders to abuse such drugs.

The aim of this study was to determine, through cross-sectional survey, the association among hormonal agents (HA) and consumption of dietary supplements, vitamins and minerals (SVM), illicit drugs (ID) and stimulants (SL), by recreational bodybuilders of Porto Alegre, Rio Grande do Sul, Brazil.

METHODS

The cross-sectional analysis held for 4 months. On this period 18 fitness training gyms were visited and 307 interviews were conducted, with 288 subjects who answered the entire questionnaire. Analytical procedure aimed to compare previous items of consumption identified in targets.

All sites were visited at least by one of the interviewers, 15 gyms (36%) were excluded for not fulfilling the inclusion criteria of the study (registration at the Municipal Bureau of Industry and Trade, there were no practice of weight training, fewer than 50

registered practitioner on the respective gym, or no voluntary adhesion to the research).

In the 18 fitness training gyms included, were gathered data from the population registered. It was estimated, initially, a population of 1,847 bodybuilding practitioners in gyms included and a total of 19,188 bodybuilding practitioners in Porto Alegre.

The data were submitted to the Consulting on Epidemiology and Biostatistics of the Research Group and Graduate Program, at Hospital de Clinicas de Porto Alegre (HCPA), which through statistical calculations estimated that there were approximately 12,300 fitness weight training lifters in Porto Alegre.

Sample size calculation was performed from an estimated prevalence of 8% for the use for HA. By considering a margin of error of up to 3% for $\alpha = 0,05$ and a power of 90%, that there was a need to interview a total of 307 participants. In the 18 sites included in the study (7-10% / 187), were visited by one of the researchers who had presented a "Introduction Letter" to the gym management. The interviews were conducted with a convenience sample, with collaboration of the fitness instructors of the respective gym that indicated the practitioner who was starting or was ending his or her workout. Questionnaire were individual applied, and before each interview, the participant received a "Consent Form".

General data were described as percentages, means and standard deviation. Individuals were grouped together, which included all classes of hormones studied (EA, HGH, Insulin, IGF-1, beta-2 agonists, gonadotropins, T3 and T4 among others), called "Hormonal Agents" (HA).

The magnitude of association of current or past HA use was verified by logistic regression. Current or past HA consumption was set as dependent variable and the current or past drugs consumption, dietary supplements or vitamins and minerals and stimulants consumption as independent variables. It was considered a significance level of alpha = 0.05 and a confidence interval (CI) 90%.

The questionnaire was developed within the standards of research ethics, as recommended by the Helsinki protocol, which was submitted and approved prior to its implementation in the following organs: the Comite de Ética em Pesquisa e Pós Graduação at the Hospital de Clinicas de Porto Alegre (HCPA), the Conselho Regional de Entorpecentes (CONEM) and the Secretaria Nacional Antidrogas (SENAD).

RESULTS

We interviewed 288 subjects in this study, 65% men and 35% women, mean age of 28.5 +-10.91 years. The goals for practicing were: fitness esthetics 83%; health 80%; medical prescription 9%; increases in performance 7%, and competition 3%.

The prevalence of current or past use for SVM was 20,5% (59/288), HA was 13.5% (39/288), SL was 7.3% (21/288), and ID was 39.2% (113 / 288).

The stimulants and illicit drugs most used were ephedrine in 27 and marijuana in 105 cases. HA most consumed were stanozolol and nandrolone decanate and the least used ones were Beta 2 agonists and triiodothyronine.

The current consumers or former drug users had 3.10 times (CI 95%, OR: 1.45-6.60) the chance to use hormonal agents than the non consumers. Dietary supplements, vitamins and minerals users had a chance of 6.45 times (CI 95% OR: 1.90-22.00) to consume hormonal agents than non users. The stimulant users were 2.54 times more likely to consume hormonal agents than non users (CI 95% OR: 1.20-5.37). These results are show in Table 1 and figure 1.

Table 1: Logistic regression analysis of current and past for use of drugs: supplements, vitamins and minerals, and stimulants, considered as independent variables. Current and past hormonal agents use set as the dependent variable.

	B	Standard Error	p	OR	CI 95% OR
Drug use	1,13	39	0,004	3,10	1,45 - 6,60
Supplements, vitamins and minerals	1,87	62	0,003	6,45	1,90 - 22,00
Use of stimulants	0,93	38	0, 014	2,54	1,20 - 5,37

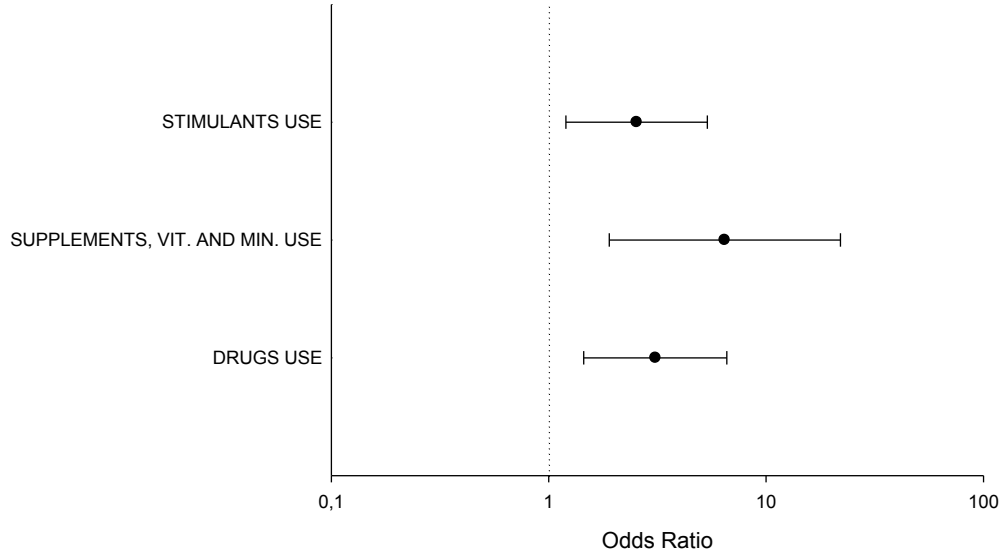

Figure 1. Associated factors with use of hormonal agents in recreational bodybuilders of the city of Porto Alegre.

DISCUSSION

Previous studies found a positive association between the abuse of psychotropic drugs with AAS (4, 5), this statement was also presented here. In our study, users of illicit drugs are more likely to use the AAS than non drug users (OR: 3.10).

The use of AAS may affect he reward region of the brain, leading to addiction, aggression and violent behavior, similar to psychotropic drugs (4, 5, 6). However, the relationship of anabolic steroids abuse and alcohol abuse is paradoxical. Alcohol abuse is a risk factor for future use of AAS, but the use of AAS decreases the risk of future alcohol abuse. The explanation may lie in the fact that steroid users have a rigid routine and discipline on training regime and diet, and the use of alcohol could thus compromise the performance or results (7).

Individuals who practice weight training in an attempt to improve results, may begin to use SVM, which later can lead to the use of HA. In our study, individuals using vitamins and dietary supplements are 6.45 times more likely to switch to an anabolic steroid than a non user of dietary supplements. Many studies have shown that weightlifters, unsatisfied with their fitness level, or with some level of body image disorder, specifically the vigorexia (reverse anorexia); decided to use dietary supplements and/or anabolic steroids (1, 4, 5, 8, 9). Vigorexia was not a variable analyzed in this work, but it is recognized as a factor that can lead to AAS abuse. This type of body image disorder is more common among AAS users than non users, however it may develop after the first AAS use. Thus, body image disorders can either be a risk factor for AAS or a consequence of it (5).

Individuals engaged in weight training and that develops or suffers from vigorexia may have a similar evolution that could be resumed as: (a) start in a sport that changes his or her body composition, such as weight training, (b) change diet for, at different periods, gain muscle mass and lose body fat, (c) start using dietary supplements to help on diet or goals achievement, and (d) can evolve to the use of illegal ergogenic aids, such as AAS (10, 11).

However, so far, there were no studies available that had made a correlation between dietary supplements use and AAS use. This is the first work that determined a risk factor for HA use, such as anabolic steroids, among SVM users. Unfortunately, the present study has some limitations. The AAS are rarely given alone, they are usually used with a mixture of other substances, such fat burners, thyroid hormones, analgesics, pro-hormones, dietary supplements and other auxiliary drugs to reduce the impact of certain side effects related to AAS, like anti-estrogenic, or to potentiate the effects of AAS (11, 12, 13). This behavior is described as polypharmacy. So the fact of dietary supplements users have more chances to AAS use may only demonstrate the pattern of these users, that in addition to AAS use, they use others ergogenics aids, among them, the dietary supplements.

We cannot make a clear cause and effect relation between the dietary supplements intake and AAS use, therefore not all risk factors are causal risk factors (5). We do not know if there is a confounding factor not analyzed here. Foote et al (14) found that vitamin supplements were more consumed by people

who eat fruits. It could be argued that the fruit intake could lead people to use vitamin supplements, what is not the case. The confounding factor is that people concerned on health issues, like people who eat fruits, could also intake vitamin supplements, there is no cause and effect, only a statistic correlation. This may be the case here, where AAS users also consume dietary supplements, by a simple matter of whether this confounding factor, the vigorexia, the polypharmacy pattern of AAS users, or even the Risk Behavior Syndrome, is present. The AAS abuse may be just one face of what is called Risk Behavior Syndrome, and not an isolated event (15). AAS users may also have other risk behaviors, like get involved in fights, carrying weapons, practice of sex without condom, suicidal behavior, driving a car after drinking, not using seat belts and others (15).

On the other hand, there could exist, indeed, a relation of supplements use leading the individual to the AAS abuse. Individuals not satisfied with results from training and supplementation, in addition to claims and marketing from supplement industry promising results through their spokesmodels, may replace supplements use for AAS abuse. In fitness training gyms there is the individual who associates his daily routine of strenuous physical exercise (e.g. hypertrophy and weight loss) to the indiscriminate use of dietary supplements with the belief that media messages are real and that the products promotes the same results showed on labels and stated on promotional advertisements. These resources employed by supplements industries promise results in performance (strength, endurance, and speed), esthetic (hypertrophy, muscle definition, weight loss) health and longevity. Spokesmodels (actor, models, athletes and bodybuilders) are often used for delivering this message, sometimes declared AAS and HGH (Human Growth Hormone) users.

CONCLUSION

We conclude that the use of dietary supplements or psychotropic drugs should be viewed as risk factors for the HA use, specially anabolic steroids, but it cannot be used as a isolated variable, other factors must also be presented. However we hope that these findings may provide future studies to help identify individuals subject to HA abuse.

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