

AWARENESS AMONGST YOUTH ABOUT USE AND ABUSE OF STEROIDS IN KARACHI, PAKISTAN

ABSTRACT

Aims: To analyze awareness regarding the use of steroids in the youth studying health sciences.

Materials and Methods:

A descriptive, observational study was conducted from September to December 2017. Youth studying health sciences aged 21–25 years in Karachi were recruited for the study, among which (n=179) 50.99% were pharmacy students and (n=172) 49% were studying allied health sciences. Descriptive statistics (SPSS version 16.0) was used to analyze the results.

Results:

Out of 400 questionnaires, the response rate was 87.75%. Majority students were knowledgeable about steroids and (72.64%) agreed that steroids should be sold as prescription only medicine in Pakistan (p= 0.00). Most of them n=147 (41.88%) had no idea about various modes of steroid abuse (p=0.00). Many participants (n= 109;31.05%) thought that steroids were found in toothpaste & dentifrices, cosmetics and ophthalmic preparations; n= 135 (38.46%) had no idea whether or not the steroids had interactions with opiates & cocaine, alcohol and benzodiazepines. The perception was seen in n= 118 (33.61%) persons that nutritional alternative/supplements could be used to reduce steroid abuse; n= 79 (22.50%) used steroids for grooming upon prescription by medical practitioner. Allergic reactions were thought as the mild side effects of steroid use by n= 100 (28.24%) while n= 166 (47.29%) considered kidney & liver diseases as severe side effects of steroid use (p=0.00).

Conclusions:

It was noted that comprehensive information about the steroids was required by youth since they were studying health sciences. Some modifications in the curriculum have to be made for providing more information about substances like steroids to the health sciences students as steroids have a great impact not only physically but also psychologically.

Keywords: Steroids misuse, abuse, anabolic androgenic steroids

INTRODUCTION

Steroids

Steroids are a group of endogenous and synthetic hydrophobic substances sharing a common structural skeleton and exhibiting considerably important variety of biological activity. Apart from the basic molecular skeleton, these substances exist with different substitutions and functional groups¹. Endogenously, steroids are synthesised and released into the circulation by the cortical tissue of the adrenal glands and from the gonads, former being regarded as corticosteroids and later as sex steroids^{2,3}. Due to their substantial biological activity, corticosteroids have been used clinically specifically for their anti-inflammatory and immunomodulatory effects, and for the treatment of hypoadrenalism^{2,4}. Potential medicinal uses of estrogens and progestins which are female sex hormones include treatment of estrogen deficiency, hormonal replacement therapy in post menopausal women, contraception, and treatment of a variety of ovarian disorders. Potential medicinal uses of androgenic hormones include treatment of debilitated muscle mass due to surgery or any other cause, anemia, osteoporosis, and delayed puberty in males⁵.

Anabolic Androgenic Steroids And Their Abuse Potential

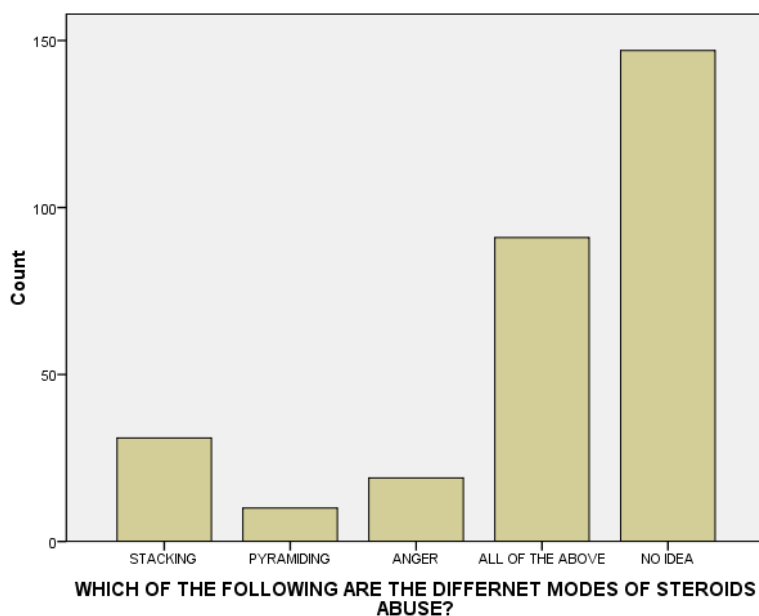
Male sex hormone, testosterone aids in muscle building and athletic performance enhancement⁶. Androgenic hormones exhibit notable abuse potential for the sake of building

1	Do you know about any supplements used by athletes?	108 (60.33)	79 (45.93)	22 (12.29)	31 (18.02)	44 (24.58)	58 (33.72)	0.49
2	Are steroids addictive?	123 (68.71)	120 (69.76)	31 (17.31)	21 (12.20)	22 (12.29)	29 (16.86)	0.30
3	Do anabolic steroids affect behavior?	110 (61.45)	100 (58.13)	12 (6.70)	16 (9.30)	53 (29.60)	54 (31.39)	0.58
4	Does prolonged use of steroids in children may affect growth & cause bone deformity?	150 (83.79)	124 (72.09)	4 (2.23)	10 (5.81)	21 (11.73)	36 (20.93)	0.02
5	Does prolonged use of steroids may lead to anger or aggression?	130 (72.62)	111 (64.53)	10 (5.58)	9 (5.23)	36 (20.11)	51 (29.65)	0.13
6	Should steroids be sold as prescription only medicine in a restricted manner in Pakistan?	129 (72.06)	126 (73.25)	28 (15.64)	9 (5.23)	20 (11.17)	34 (19.76)	0.00

Where p* value = <0.05 is significant

Group A= pharmacy students; Group B= allied health sciences students

Figure: Awareness about various modes of steroid abuse



The figure shows awareness of all respondents about various modes of steroid abuse (p=0.00) i.e. most of them n=147 (41.88%) had no idea (n=54 pharmacy students, n=93 allied health sciences students) about various modes of steroids abuse while n=91 (25.92%) replied (n=63

pharmacy students, n=28 allied health sciences students) that all the modes were associated with steroid abuse.

Total respondents who used oral or topical steroids were n=111 (31.62%) among which n=49 (44.14%) were pharmacy students and n=62 (55.85%) were allied health sciences students; n= 54 had 'No idea' about whether they had used steroids or not (p=0.02).

Table 2 shows significant responses among Group A and Group B regarding the perception about steroids.

Table 2: Perception about steroids

S. No	Question	Group A (n)	Group B (n)	p* value
1	Do the following contain steroids? a-toothpaste & dentifrices b-cosmetics e-ophthalmic d-all above e-no idea	9 68 22 60 18	27 17 26 49 51	0.00
2	Which steroids are safer? a- oral b- injectable c- all above d- no idea	97 21 12 45	78 16 7 69	0.06
3	Which of the following have interaction with steroids? a- opiates & cocaine b- alcohol c- benzodiazepines d- all above e- no idea	19 16 11 73 56	41 17 17 18 79	0.00
4	What can be done to reduce steroid abuse? a-learning alternatives b-nutritional alternative/supplements c-weight barring alternative d-all above e-no idea	36 71 13 37 17	30 47 15 47 30	0.03
5	Which are the mild side effects of steroids? a- infections b- allergic reactions c- skin discoloration & hair loss d- all above e- no idea	16 42 53 53 13	17 58 18 36 44	0.00
6	Which are the severe side effects of steroids? a- bleeding in joints b- kidney & liver disease c- breast cancer in women d- all above e- no idea	6 94 21 40 15	9 72 18 43 39	0.00

Where p* value = <0.05 is significant

Group A= pharmacy students; Group B= allied health sciences students

It can be seen from Table 3 that medical practitioner were the main prescribers of steroids to the respondents which was mainly used as anti inflammatory and for grooming purpose; length of treatment for most respondents was from few days to few weeks; mostly no side effects were observed by respondents and even if they occurred, they had no idea about their severity.

Table 3: Steroid use by respondents

S.No	Question	Group A (n)	Group B (n)	p* value
1	Who prescribed steroids to you? a-trainer b-medical practitioner c-friend d- self	7 61 13 13	14 62 5 12	0.20
2	Why you used steroids? a-as anti infective b-as as anti inflammatory c-as immunosuppressant d-to improve mass & strength e-for grooming f-no idea	13 29 6 17 17 52	23 28 8 12 62 31	0.08
3	If used for grooming, then what was the purpose of grooming? a-to be stronger athlete b-build more muscles c-to reduce fats d- to treat baldness e- others	7 25 5 4 28	6 19 5 6 30	0.78
4	What was length of your treatment? a- few days b- few weeks c- few months d- a year	31 31 15 9	55 23 5 4	0.00
5	Did you complete the course of your treatment? a-yes b- no c-left in between	34 47 17	43 45 8	0.14
6	Did you suffer from any side effects? a-yes b-no c-no idea	26 54 20	25 58 16	0.74
7	If yes, the side effects were: a-mild b-severe c-no idea	24 16 51	27 13 47	0.75

Where p* value = <0.05 is significant

Group A= pharmacy students

Group B= allied health sciences students

DISCUSSION:

Results express that most of the study participants were aware about the abuse potential of steroids and they (72.64%) affirm that steroids should only be sold with a valid prescription (see table 1). Furthermore, all participants reported to be aware of potential adverse effects of anabolic steroids like adverse effects related to addiction (68.7%), behaviour (61.45%) and growth (83.79%). Though reported adverse effects of steroids include, impairment of insulin activity leading to glucose intolerance, higher risk of cardiovascular diseases, cerebro-vascular disease, disorders of musculoskeletal system, prostate cancer and psychological disturbances¹⁵. This outcome can be attributed to the fact that all study participants were associated with health science. A significant proportion (31.62%) of respondents reported using oral or topical steroids. It has been documented that topical steroids have been used for the purpose of brightening skin complexion nevertheless, even topical steroids may cause local and even systemic adversities including severe dependence¹⁶. Among participants who have used steroids, most (61% of pharmacy students and 62% of allied health sciences students) were prescribed by the medical practitioners. For this reason it can be assumed that medical practitioners can play their role to assist safe use of steroids. It has been reported by a study conducted in Islamabad, Pakistan that rheumatologist irrationally prescribe steroids to a large number of patients suffering from arthritis and other related inflammatory conditions¹⁷. However, situation varies with the different set of audiences; Baker et al. reported that around 70% of the participants of their study who went to health club used anabolic androgenic steroids¹⁸. It is pertinent to mention here that even long after the discontinuation of anabolic steroids, cardiac remodeling is not completely reversed¹⁹. Opinions of pharmacy student regarding potential strategies to minimize steroid abuse significantly differed from the students of allied health sciences ($p = 0.03$). When asked about safety of the steroids with respect to route of administration, opinion of pharmacy students did not significantly vary from the students of allied health sciences ($p = 0.06$); ubiquitous opinion in case of pharmacy students (97%) and students of allied health sciences (78%) was that oral steroids are safer as compared to the parenteral.

CONCLUSION:

It was observed that the youth studying health sciences had some very basic knowledge about the steroids but were lacking about comprehensive information which should be worked upon by the institutions so that when the youth is ready to serve the community, they serve it well.

ACKNOWLEDGEMENT:

The efforts of Miss Wajeeha Latif, Dow College of Pharmacy, Dow University of Health Sciences, in the completion of survey are highly acknowledged.

CONFLICT OF INTEREST:

“No conflict of interest associated with this work”.

REFERENCES

1. Graham LP. An Introduction to Medicinal Chemistry. New York: Oxford University Press; 1995.
2. Ericson-Neilsen W, Kaye AD. Steroids: pharmacology, complications, and practice delivery issues. The Ochsner Journal. 2014;14(2):203-7.
3. Goodman LS. Goodman and Gilman's The Pharmacological Basis of Therapeutics: McGraw-Hill New York; 1996.
4. Stewart P, Krone N. The adrenal cortex. Williams's textbook of endocrinology. Philadelphia: Elsevier; 2011.
5. Katzung BG, Masters SB, Trevor AJ. Basic & clinical pharmacology 2004.
6. Bahrke MS, Yesalis CE. Abuse of anabolic androgenic steroids and related substances in sport and exercise. Current Opinion in Pharmacology. 2004;4(6):614-20.
7. Gazvani M, Buckett W, Luckas M, Aird I, Hipkin L, Lewis-Jones D. Conservative management of azoospermia following steroid abuse. Human Reproduction (Oxford, England). 1997;12(8):1706-8.

8. Brower KJ. Anabolic steroid abuse and dependence. *Current Psychiatry Reports*. 2002;4(5):377-87.
9. Hall RC, Hall RC. Abuse of supraphysiologic doses of anabolic steroids. *Southern Medical Journal*. 2005;98(5):550-6.
10. Ali U. A body blow: The deadly practices among bodybuilders in Punjab. *Herald*; 2017 [cited 2017 26th November]; Available from: <https://herald.dawn.com/news/1153619>.
11. Kanayama G, Hudson JI, Pope HG. Long-term psychiatric and medical consequences of anabolic-androgenic steroid abuse: A looming public health concern? *Drug and Alcohol Dependence*. 2008;98(1):1-12.
12. Vanberg P, Atar D. Androgenic anabolic steroid abuse and the cardiovascular system. *Doping in Sports: Biochemical Principles, Effects and Analysis*: Springer; 2010. p. 411-57.
13. de Souza GL, Hallak J. Anabolic steroids and male infertility: a comprehensive review. *BJU International*. 2011;108(11):1860-5.
14. Hall RC, Hall RC, Chapman MJ. Psychiatric complications of anabolic steroid abuse. *Psychosomatics*. 2005;46(4):285-90.
15. Hickson RC, Ball KL, Falduto MT. Adverse effects of anabolic steroids. *Medical Toxicology and Adverse Drug Experience*. 1989;4(4):254-71.
16. Nnoruka E, Okoye O. Topical steroid abuse: its use as a depigmenting agent. *Journal of the National Medical Association*. 2006;98(6):934.
17. Farooqi A, Aman R, Qamar T, Aziz S. Corticosteroid use and abuse by medical practitioners for arthritis and related disorders in Pakistan. *British Journal of Rheumatology*. 1997;36(1):91-4.
18. Baker J, Graham M, Davies B. Steroid and prescription medicine abuse in the health and fitness community: A regional study. *European Journal of Internal Medicine*. 2006;17(7):479-84.
19. Urhausen A, Albers T, Kindermann W. Are the cardiac effects of anabolic steroid abuse in strength athletes reversible? *Heart*. 2004;90(5):496-501.

Reviewer's COPY