



RESEARCH ARTICLE

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

Fakhsheena Anjum*¹, Auwais Ahmed Khan¹, Sana Ghayas¹, Amna Mehtab¹, Umm-E-Aiman¹, Mehak Idrees¹

Dow College of Pharmacy, Dow University of Health Sciences, Karachi, Pakistan.

Article Info:



Article History:

Received: 23 May 2018

Reviewed: 6 July 2018

Accepted: 25 August 2018

Published: 15 September 2018

Cite this article:

Anjum F, Khan AA, Ghayas S, Mehtab A, Umm-e-Aiman, Idrees M. Awareness amongst youth about use and abuse of steroids in Karachi, Pakistan. Universal Journal of Pharmaceutical Research 2018; 3(4): 51-55. <https://doi.org/10.22270/ujpr.v3i4.184>

*Address for Correspondence:

Dr. Fakhsheena Anjum, Dow College of Pharmacy, Dow University of Health Sciences, Karachi, Pakistan.

E-mail: fakhsheena.anjum@duhs.edu.pk

Abstract

Objective: Aim of present study was to analyze awareness regarding the use of steroids in the youth studying health sciences. 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.

Methods: 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 and dentifrices, cosmetics and ophthalmic preparations; n= 135 (38.46%) had no idea whether or not the steroids had interactions with opiates and cocaine, alcohol and benzodiazepines.

Results: 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 and liver diseases as severe side effects of steroid use ($p=0.00$).

Conclusion: It is concluded 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: Abuse, anabolic androgenic steroids, steroids misuse.

INTRODUCTION

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 synthesized 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 muscle mass and for this reason these substances have been known to be quite popular among individuals who are interested in athletic and body building activities⁷. Several derived forms of male sex hormones are commercially available and are subject to

abuse by athletes especially bodybuilders and those who are aiming at weight lifting exercises⁸. Abusers do not only expose themselves to androgens but also to the concentrations of steroids which are significantly higher than those observed in normal physiology⁹. In Pakistan, there have been a lot of conversations about growing trend of steroid abuse among professional and recreational bodybuilders and athletes. A number of reports have surfaced linking steroid abuse with adverse consequences including fatalities¹⁰.

Adverse Health Impact of Anabolic Androgenic Steroid Abuse

Significantly encountered adverse health effects that can be linked with the persistent abuse of anabolic androgenic steroids include atherosclerosis, cardiomyopathies, inhibition of testes and their function, development of certain cancers, depression and dependence¹¹. In various reports, myocardial infarction, hypertrophic ventricular diseases, cardiac failure, thrombotic events including atherosclerosis and pulmonary embolism and sudden cardiac has been linked with the anabolic androgenic steroid abuse. Myocardial infarction appears to be the most frequent cardiovascular adversity that can be linked with the anabolic androgenic steroid abuse¹².

Since the abuser is taking supra-physiologic levels of androgenic steroids from exogenous sources, male gonads which were otherwise responsible for physiological synthesis of androgens are taken into an inhibited state by the endocrine negative feedback mechanism. This results in overall reduced function of male gonads eventually leading to impaired quality and quantity of sperm. Overall quality of semen is badly affected. All of these effects may eventually contribute to the development of male infertility¹³. Psychiatric problems experienced with the use of anabolic androgenic steroids are thought to be generally reversible and dependant on the doses used. Such adverse effects include depressive disorders, mania, psychosis and dependence¹⁴. Pharmacological uses of anabolic androgenic steroids are not known to cause

dependence. However, reports suggest incidence of dependence among bodybuilders and athletes of related nature is not unexpected⁸.

MATERIALS AND METHODS

Design

A descriptive, survey based study was conducted from September to December 2017. Out of 400 questionnaires, n=351, were completely filled and returned by the students (response rate = 87.75%).

Participants

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.

Measurements

Descriptive statistics (SPSS version 16.0) was used to analyze the results.

RESULTS

For the study, 400 Performa were distributed among various health sciences students and the response rate was 87.75% (n=351). The age group of respondents was 21-25 years among which there were (n=179) 50.99% pharmacy students and (n=172) 49% allied health sciences students. From Table 1 it can be seen that majority of the students replied in affirmative regarding the questions of knowledge about steroids. Most of them (72.64%) agreed that steroids should be sold as prescription only medicine in Pakistan ($p=0.00$). 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.

Table 1: Knowledge regarding steroids.

S. N.	Question	Yes (%)		No (%)		No idea (%)		p* value
		Group A	Group B	Group A	Group B	Group A	Group B	
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 and 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

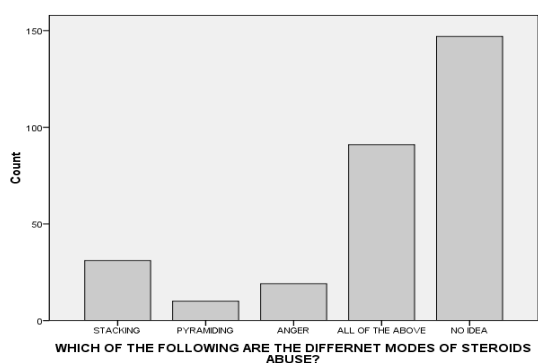


Figure 1: Awareness about various modes of steroid abuse.

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. 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 2: Perception about steroids.

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

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 (Table 1). Furthermore, all participants reported to be aware of potential adverse

effects of anabolic steroids like adverse effects related to addiction (68.7%), behavior (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, cerebrovascular disease, disorders of musculoskeletal system, prostate cancer and psycho-logical

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.

Table 3: Steroid use by respondents.

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

Where p* value = <0.05 is significant, Group A= pharmacy students, Group B= allied health sciences students

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.

ACKNOWLEDGEMENTS

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

AUTHOR'S CONTRIBUTION

Anjum F: writing original draft, conceptualization. **Khan AA:** methodology, investigation. **Ghayas S:** writing, review, and editing, supervision, resources. **Mehtab A:** writing, review, and editing. **Umm-e-Aaiman:** writing, review, and editing, project administration. **Idrees M:** methodology, investigation, formal analysis. All authors revised the article and approved the final version.

DATA AVAILABILITY

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

CONFLICT OF INTEREST

No conflict of interest associated with this work.

REFERENCES

- Graham LP. An Introduction to Medicinal Chemistry. New York: Oxford University Press; 1995.
- Ericson-Neilsen W, Kaye AD. Steroids: pharmacology, complications, and practice delivery issues. *The Ochsner J* 2014;14(2):203-7. PMID: 24940130
- Goodman LS. Goodman and Gilman's The Pharmacological Basis of Therapeutics: McGraw-Hill New York; 1996. <https://doi.org/10.1001/jama.1996.03540120077042>
- Stewart P, Krone N. The adrenal cortex. Williams's textbook of endocrinology. Philadelphia: Elsevier; 2011.
- Katzung BG, Masters SB, Trevor AJ. Basic and clinical pharmacology 2004.
- Bahrke MS, Yesalis CE. Abuse of anabolic androgenic steroids and related substances in sport and exercise. *Curr Opin Pharmacol* 2004; 4(6):614-20. <https://doi.org/10.1016/j.coph.2004.05.006>
- 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. <https://doi.org/10.1093/humrep/12.8.1706>
- Brower KJ. Anabolic steroid abuse and dependence. *Curr Psych Rep* 2002; 4(5):377-87. <https://doi.org/10.1007/s11920-002-0086-6>
- Hall RC, Hall RC. Abuse of supraphysiologic doses of anabolic steroids. *South Med J* 2005; 98(5):550-6. <https://doi.org/10.1097/01.SMJ.0000157531.04472.B2>
- Ali U. A body blow: The deadly practices among bodybuilders in Punjab. *Herald*; 2017
- 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. <https://doi.org/10.1016/j.drugalcdep.2008.05.004>
- Vanberg P, Atar D. Androgenic anabolic steroid abuse and the cardiovascular system. *Doping in Sports: Biochemical Principles, Effects and Analysis: Springer*; 2010. 411-57. https://doi.org/10.1007/978-3-540-79088-4_18
- de Souza GL, Hallak J. Anabolic steroids and male infertility: A comprehensive review. *BJU Int* 2011; 108(11):1860-5. <https://doi.org/10.1111/j.1464-410X.2011.10131.x>
- Hall RC, Hall RC, Chapman MJ. Psychiatric complications of anabolic steroid abuse. *Psychosomatics* 2005; 46(4):285-90. <https://doi.org/10.1176/appi.psy.46.4.285>
- Hickson RC, Ball KL, Falduto MT. Adverse effects of anabolic steroids. *Medical Toxicol Adv Drug Exp* 1989; 4(4):254-71. <https://doi.org/10.1007/BF03259912>
- Nnoruka E, Okoye O. Topical steroid abuse: its use as a depigmenting agent. *J National Medl Assoc* 2006; 98(6):934. PMID: 16775916
- Farooqi A, Aman R, Qamar T, Aziz S. Corticosteroid use and abuse by medical practitioners for arthritis and related disorders in Pakistan. *Brit J Rheumatol* 1997; 36(1):91-4. <https://doi.org/10.1093/rheumatology/36.1.91>
- Baker J, Graham M, Davies B. Steroid and prescription medicine abuse in the health and fitness community: A regional study. *Eur J Int Medicine* 2006; 17(7):479-84. <https://doi.org/10.1016/j.ejim.2006.04.010>
- Urhausen A, Albers T, Kindermann W. Are the cardiac effects of anabolic steroid abuse in strength athletes reversible? *Heart* 2004; 90(5):496-501. <https://doi.org/10.1136/hrt.2003.015719>