ORIGINAL ARTICLE

EVALUATION OF RECREATIONAL USE OF APHRODISIAC DRUGS AND ITS CONSEQUENCES: AN ONLINE QUESTIONNAIRE BASED STUDY

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ABSTRACT
BACKGROUND: Aphrodisiac drugs are being increasingly used as a sexual enhancement aid among men without a medical indication. Recreational use of aphrodisiacs has been associated with increased sexual risk behavior, an increased risk for STIs, including HIV infection, and high rates of concomitant illicit drug use. The aim of the present study was to investigate the knowledge, extent, reason and consequences of the use of aphrodisiac drugs. **METERIALS AND METHODS:** It was an online questionnaire based study, conducted between August 2011 and January 2012. Males >15 years of age were included. 257 responses from around the world had been collected. **RESULTS:** Among of them 183 responses were complete and 74 responses were incomplete. Of these responders, 68% had knowledge and 26% had used aphrodisiacs. Amongst the users (n=55) 90% had used aphrodisiacs for recreational purpose and the most common drugs were phosphodiesterase inhibitors (42%) followed by yohimbine (12%). Majority (74%) of the users were between 15-30 years of age. Enhanced erection (37%) and painful erection (18%) were the most common positive and negative outcomes respectively. The most common substance abuse with aphrodisiacs was alcohol (19%), followed by cannabis (7%). Eighteen percent population had multiple sexual partners. Eight percent population was having HIV or any other STI. Prevalence of HIV (18.18%) among users was 2 to 3 fold higher than most HIV prevalent Sab-saharan African area (4.8%). **CONCLUSION:** This study shows that recreational aphrodisiac use is relatively common among men and it is associated with of illicit substance abuse, increase sexual risk behavior and increase risk of STIs.

Key words: Aphrodisiacs,questionnaire, Sexual risk behavior, Substance abuse

INTRODUCTION

An aphrodisiac is a substance that increases sexual desire.[1 2] The name comes from *Aphrodite*, the Greek goddess of sexuality and love. For centuries men and women have attempted to enhance their sexual experiences with a variety of chemicals. There is a rich history in all cultures of using substances derived from plants and animals, as well as synthetic materials, to change the sexual experience.[3]

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Though main indication of Aphrodisiac drugs is erectile dysfunction[4], these drugs are excessively and recreationally use for sexual enhancement.[5] Those with normal erectile functioning do sometimes use these drugs.[5] Aphrodisiac drugs consist of the drugs like sildenafil (Viagra) which is a phosphodiesterase-5 (PDE-5) inhibitor that was originally developed for the treatment of angina.[6-13] Due largely to a massive, global, advertising campaign, the drug quickly became a cultural icon and these drugs are being excessively and recreationally used without prescription.[14] Overall profit of Viagra alone was rising up to $628 million during April to June 1998.[15] After introduction of Viagra, thousands of aphrodisiac drugs are available which covers market of billions of dollar. Other drugs viz. Vardenafil, tadalafil, Yohimbine, Amphetamine, Mephamphetamine, Alkyl nitrites, Nitric oxide, paroxetine, fluoxetine, ketamine are also being used as aphrodisiacs.[16-26] This class of medication is well tolerated by most patients, with

temporary side effects including headache, nasal congestion, dyspepsia, distorted vision, painful erection, chest pain. Concordant use of aphrodisiacs and illicit drugs poses several serious health concerns. Use of nitrates and some erectile dysfunction medicines simultaneously is contraindicated as it can cause severe hypotension, cardiac complications, and even death.[19] Furthermore, concurrent use of illicit drugs and aphrodisiacs may potentiate high-risk sexual behavior by increasing social disinhibition while simultaneously enhancing sexual performance by decreasing the post-orgasmic refractory period[27] thereby facilitating the ability to have more sexual partners in a short period of time.[28] aphrodisiacs are used recreationally for motives and reasons like : add to the fun, maintain an erection, counteract the effects of alcohol and drugs, increase erectile rigidity, have sex for hours, impress sexual partner, enhance self-esteem, curiosity, increase sex drive, decrease refractory phase, improve sensation.[22] Studies indicate that those who recreationally use sildenafil citrate and have sex with men are more commonly engaged in unprotected anal intercourse, which leads to two and six times more common HIV and other sexually transmitted infections (STIs) respectively.[23] Aphrodisiac users also report a higher number of sex partners and about a twofold rate in STIs, including HIV infection. [22,23] These medications foster greater friction during sex owing to enlarged erection size and prolonged sex, the recreational use of this substance warrants investigation in the context of risk of HIV and other sexual transmitted diseases. Given the need to expand this body of research, we conducted an exploratory study designed to identify the knowledge of aphrodisiacs as well as to bivariate correlates of recreational use of aphrodisiacs with other substances, homosexuality, HIV and other sexual transmitted diseases. Our first aim was to assess the rates of recreational use of aphrodisiac drugs and explore descriptive characteristics related to their use, such as frequency and length of use, motivations for use, source(s) of acquisition, and concomitant illicit drug use. Second, we aimed to investigate associated risk factors for recreational use of aphrodisiac drugs, including demographic characteristics, as well as sexual behavior and substance abuse characteristics.

MATERIALS AND METHODS

Male candidates greater than 15 years old were included in this study. While female candidates were excluded from this study. Informed consent was obtained from all of the patients participating in the study. Institutional ethics committee approval was taken. Main outcome measures : It was an online questionnaire based study. The peer reviewed questionnaire was posted on www.kwiksurveys.com. A link to the survey was posted in various forums, groups, social networking sites, education sites and sites of drug information, several sexual-oriented chatrooms and bulletin boards in a six month period from 15 august 2011 to 15 January 2012. All the details were held with confidentiality and privacy of all responders were maintained. Questionnaire consists of introduction, instructions, and personal details. Further it also includes knowledge and source of aphrodisiacs drugs; frequency and usage of them; reason of using them and positive as well as negative outcomes of aphrodisiac drugs. At last, it consists of the use of other drugs with aphrodisiacs and sexual orientation of drugs users. Some data fields on the survey were open text fields, that is, respondents could type in whatever responses they chose. This was important to capture subjective experiences and personal interpretation of experiences. All data were collected, held, and analyzed as a confidential matter.

RESULTS

When the survey was closed, 257 responses from around the world had been collected. Among of them 183 responses were complete and 74 responses were incomplete. All 183 responders were further spastically analyzed. The sample had a mean age of 31.13 (SD= 10.91, range 16-71). The most common age group was between 20 to 30 years. The current situation of the sample was 31.75% students, 50.27% employed, 10.39% unemployed, 5.46 % retired, and 2.75% other. Majority of the responders were highly educated as 39.89% were graduates and 36.61% were post graduates. While only 23.5% of responders had lower than or equal to higher education. The racial composition of the sample was 62.29% Asian, 6.55% Europeans, 4.37% South American, 12.51% North Americans, 7.10% Australians and 7.10% Africans. 144 responders had knowledge about aphrodisiacs and 39 responders had never heard about drugs to enhance sexual performance. Amongst the responders, 78% (n=183) responders had knowledge about aphrodisiacs. The most common source of gaining knowledge was in 37% from health literature and internet, 32% from friends and relatives, 26% from media, 6% from other. 3 responders among other were physicians, 1 had gained knowledge from psychiatric and 1 responder had done theses about aphrodisiacs. The knowledge of different aphrodisiacs were as following: PDE 5 inhibitors (n=204) including sildenafil, verdenafil and tadalafil were the most common drugs followed by yohimbine (n=54), Amphetamine (n=37), mephamphetamine (n=44), ketamine (n= 26), pramipraxole (n=12), alkyl

nitrites (n=29), paroxetine (n=21), fluoxetine (n= 38), penile Cream/Oil (n= 31), herbal products (n= 30), other (n=10). Among other 06.94% polyherbal formulation, asparagus racemosus, curculigo orchioides, tribulus terrestris, fadogia agrestis & dactylorhiza hatagirea, jordan creams oil, vimax pills, ozomen penis massage oil, marijuana and bhang, japani oil, grass oil, vaajikarana therapy, minyak lintah tapa, duroil, vigrx plus, semenex, instant performer pills were commented as aphrodisiacs. Among 144 responders who had knowledge about aphrodisiacs, 55 responders (38.19%) had used aphrodisiac once or more than once throughout their lives while 89 (61.81%) responders had never used aphrodisiacs throughout their lives. The following results pertain to only those participants reporting use of aphrodisiacs. The extent of use of different aphrodisiacs were as following: sildenafil (n=39), verdenafil (n=6), tadalafil (n=7) yohimbine (n=15), Amphetamine (n=7) mephamphetamine (n=8), ketamine (n=7), pramipraxole (n=3), alkyl nitrites (n=11), paroxetine (n=11), fluoxetine (n= 4), penile Cream/Oil (n= 4) herbal products (n= 3), other (n=2). Among other 2% jordan creams and oil, duroil, vimax pills, instant performer pills, vigrx plus, semenex, vati-iln, vaajikarana therapy were used as aphrodisiacs. Approximately 50% (n=27) users were between 21-30 years. While 24% (n=13) were between 15-20 years, 22% (n=12) were between 31-40 years, 3 % (n=2) were between 41-50 years and 2% (n=1) were between 51-60 years Amongst the aphrodisiac users, only 9.78% (n=9) had used aphrodisiac for erectile dysfunction while 90.22% (n=46) responders had used aphrodisiacs for other purpose. Among recreational users 28 responders (30.43%) has used to enhance sexual performance, 22 responders (23.91%) had used for curiosity or experiment purpose, 18 responders (19.57%) had used for increase penis erection, 12 responders (14.13%) had used to impress sexual partner and 2 responders (2.17%) had used for other purpose like anxiety and hard core sex. Amongst the aphrodisiacs users, majority of the users (90.22%) had acquired drugs without prescription from various places like pharmacy stores, internet, drug dealers, sex partners and friends. While 9.78 % responders had a prescription for the aphrodisiac drugs b: purpose like anxiety, hard core sex. Amongst the aphrodisiac users, 83.64% users had experienced positive outcome like enhanced erection (36.36%), longer lasting erection (27%), however 16.36% responders had reported no change in outcome. As shown in table 4, 24 participants (32%) had experienced no negative outcome or adverse drug reaction. Experienced negative outcomes in rest of participants among aphrodisiac users were following: painful erection (n= 14, 18.67%), headache (n= 11, 14.67%), blurring of vision (n= 8, 10.67%), dizziness/loss of energy (n=7, 09.33%), flushing/redness of face (n= 6, 08.00%), epistaxis (n= 3, 04.00%), chest pain (n=2, 02.67%) Results also suggests that 11 participants (20%) were using aphrodisiacs though they had knowledge of serious negative outcome/adverse drug reaction Among aphrodisiac users, 46 participants (83.63%) reported that they have used other substance and/or recreational drugs along with aphrodisiacs. Reported illicit drugs and/or recreational drugs among 46 included alcohol (n=41), cocaine (n= 9), lysergic acid diethylamide (LSD) (n= 9), tobacco (n= 5), anabolic Steroid (n=3), opiates (n=2), others (n=2) as psilocybin mushrooms, PCP, popper, blaze, snow white. 9 participants (16.37%) reported using no other drugs at the time they used aphrodisiacs. As shown in table 5, 34 participants (61.82%) reported themselves as heterosexual, while 10 participants (18.18%) and 11 participants (20%) reported themselves as homosexual and bisexual respectively. majority of the responders who had used aphrodisiacs (n=38) reported to have more than one sexual partners including 2-5 partners (n=17), 6-10 partners (n= 11), 11-15 partners (n=8), 16-20 partners.(n=2). Among aphrodisiac users, 10 responders (18.18%) were HIV positive and 8 responders (14.55%) had sexual transmitted diseases other than HIV. Forty one responders (74.55%) were HIV negative. 4 participants (07.27%) did not know their HIV status Among HIV positive responders, 9 responders they became HIV positive after starting the use of aphrodisiacs. Only 1 participant was HIV positive before starting or at the time of starting use of aphrodisiacs. Four responders among 8 responders had sexual transmitted disease after starting use of aphrodisiacs, 3 participants had sexual transmitted disease at the time of starting use of aphrodisiacs while 1 participant had sexual transmitted disease before starting use of aphrodisiacs. Out of 13 participants having STD/HIV 8 participants had 6-10 sexual partners and 5 participants had 11-15 sexual partners. 5 among of 15 participants had both HIV as well as STD

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Table 1: Characteristics of participants (N=183)

Characteristic	N	%		N	%		N	%
Current situation			**Education**			**Race/Ethnicity**		
Student	57	31.75	**Primary**	2	1.09	**Asian**	114	62.29
Employed	92	50.27	**Secondary**	12	6.56	**Europeans**	12	6.55
Unemployed	19	10.38	**Higher secondary**	29	15.85	**South Americans**	8	4.37
Retired	10	5.46	**Graduate**	73	39.89	**North Americans**	23	12.51
Other	5	2.75	**Post Graduate**	67	36.61	**Australians**	13	7.10
						Africans	13	7.10

Table 2: Characteristics of aphrodisiac usage

Characteristic	**n**	**%**	**Characteristic**	**n**	**%**	**Characteristic**	**n**	**%**
Age of aphrodisiac users			**Reason for using aphrodisiacs**			**Sources of acquisition**		
15-20 years	13	23.65	Erectile dysfunction	9	9.78	Pharmacy store (with prescription)	10	10.87
21-30 years	27	49.09	Enhance sexual performance	28	30.43	Pharmacy store (without prescription)	36	39.13
31-40 years	12	21.82	Increase penis erection	18	19.57	Friends	8	8.70
41-50 years	2	3.64	Curiosity or Experimentation	22	23.91	Relatives	0	0
51-60 years	1	1.82	Impress sexual partner	13	14.13	Sex partner	10	10.87
			Other	2	2.17	Internet	16	17.39
						Drug Dealer	12	13.04
						Other	0	0

Table 3: Outcome of usage of aphrodisiacs

Outcome	**n**	**%**	**Outcome**	**n**	**%**	**Out-come**	**n**	**%**
Positive outcomes			**Negative outcomes**			**Awareness about negative outcomes**		
Nothing changed	09	16.36	Painful erection	14	18.67	Yes	11	20
Enhanced erection (hardness)	20	36.36	Blurring of vision	8	10.67	No	44	88
Longer lasting erection	15	27.27	Dizziness/loss of energy	7	09.33			
Multiple erection	05	9.09	Epistaxis	3	04.00			
Delayed ejaculation	06	10.91	Bleeding from any site	0	0.00			
Others	00	00	Headache	11	14.67			
			Chest pain	2	02.67			
			Flushing/redness of face	6	08.00			
			None	24	32.00			
			Others	0	0.00			

Table 4: Substance abuse associated with aphrodisiac drug

Substance abuse associated with aphrodisiac	**n**
Alcohol	41
Tobacco	5
Cocaine	9
Lysergic acid diethylamide (LSD)	9
Cannabis, Marijuana	15
Opiates	2
Anabolic Steroids	3
GHB Gamma-Hydroxybutyrate	14
Others	2
None	9

Table 5: Sexual orientation of aphrodisiac drug users

Characteristic	n	%	Characteristic	n	%
Sexual orientation of aphrodisiac drug users			**No. of sexual partners**		
Heterosexual	34	61.82	1	17	30.91
Homosexual	10	18.18	2-5	17	30.91
Bisexual	11	20.00	6-10	11	20.00
			11-15	8	14.55
			16-20	2	3.64
			>21	0	0.00

Table 6: Association of HIV and other STIs with use of aphrodisiac drugs

Characteristic	n	%	Characteristic	n	%
HIV status			**Sexual transmitted diseases**		
Positive	10	18.18	Yes	8	14.55
Negative	41	74.55	No	47	85.45
Don't know	04	07.27			

Table 7: Characteristic of HIV positive participants.

Age when participant used aphrodisiac first time	n	%	Age when participant became HIV positive	n	%
15-20 years	2	20	15-20 years	2	20
21-30 years	7	70	21-30 years	5	50
31-40 years	1	10	31-40 years	3	30

Table 8: Characteristic of sexual transmitted disease participant.

Age when participant used aphrodisiac first time	n	%	Age when participant had STD	n	%
15-20 years	4	40	15-20 years	3	37.50
21-30 years	6	60	21-30 years	4	50.00
31-40 years	0	0	31-40 years	1	12.40

DISCUSSION

Though main indication of aphrodisiac drugs is erectile dysfunction, these drugs are excessively and recreationally use for sexual enhancement. Those with normal erectile functioning do sometimes use these drugs. Significantly higher level of risk for STD and HIV transmission were observed among aphrodisiacs users. Hence it should only be taken under direct supervision of a health care provider. The current study examined patterns of and associated risk factors for recreational use of aphrodisiac drugs on a large geographically diverse sample above 15 years old males. Among all responders who had participated in this study, had a

mean age of 31.13 (SD= 10.91, range 16-71). The most common age group was between 20 to 30 years. Sixty eight percent populations had knowledge of aphrodisiac drugs. . The most common source of gaining knowledge was in 37% from health literature and internet, 32% from friends and relatives, 26% from media, and 6% from other. PDE-5 inhibitors are the most common aphrodisiacs they know followed by mephamphetemine and yohimbine. All these data shows that the advanced use of internet and information technology have aware population about various aphrodisiacs available in market. Results indicated that 38.19% of participants had used aphrodisiacs at some point in their lives. The lifetime rate of use of aphrodisiacs reported here was slight higher than that of rates reported in study carried out in USA (28%) [29] And in graduates of Sao Paulo, Brazil (15%) [24] samples. A young population-based sample in Finland (3%) [30], as well as a small sample of undergraduate men in the United States (6%) [31] Most likely owing to fact that these studies were based only for school or college going students. The most common user group was between ages 21-30 years (49%) followed by between 15- 20 years (23%). The mean age for the recreational users group were 22.28 years almost similar to study carried out in USA having mean age value 21.9 years [26]. These data suggests that recreational use of aphrodisiacs is common in young population. Among users PDE-5 inhibitors (42%) was the most common aphrodisiac to be used. Followed by Amphetamine(5%) and ketamine (5%). The similar results were seen in study done by Crosby and Di Clemente in 2004, suggesting 35% recreation use of ecstasy (amphetamine) and 16% recreational use of Viagra (sildenafil). In our study majority of the responders had knowledge about PDE-5 inhibitors as aphrodisiacs. Hence these drugs were commonly used than the other aphrodisiacs. In our study 4.92% population had used aphrodisiacs for erectile dysfunction which was almost similar to study carried out in USA having 2% with prescription for erectile dysfunction (Harte et al, 2011) In our study we found that the major source (90%) of acquisition for aphrodisiac drug was without prescriptions among them the most common source was pharmacy stores (39%) followed by internet (18%). Only 10% of the aphrodisiacs were used with prescription. In present study these drugs were used for recreational purpose. It indicates misuse of these drugs leads to risk of HIV and other STDs. Approximately 90% population had used aphrodisiac for recreational purpose. This finding was similar to other study carried out in USA (77%) and 72% [26]. The most common recreational reason for using aphrodisiac was to enhance sexual performance (30.43%) followed by curiosity or experiment purpose (23.91%). 9.78% have used aphrodisiac for erectile dysfunction. The reason behind higher used of aphrodisiacs recreationally are enhancement of sexual performance including increased duration of erection, decreased refractory period and the ability to have more partners in a short period of time. The most common positive outcome for the use of aphrodisiacs was enhanced erection causing hardness (36.36%) followed by longer lasting erection (26.26%). Commonest negative outcome was painful erection (18.67%) followed by headache (14.67%). Frequency and breadth of substance use were both independently associated with recreational aphrodisiac use. Data revealed similar results, 83% of the sample of recreational EDM users reporting concomitantly mixing EDMs with alcohol and/or illicit substances, the most common of which were alcohol (37%), marijuana/cannabis (14%). These findings were similar to other studies examining patterns recreational drug and EDM use in young men [, 27, 28] The risk of infection was substantially increased when both EDM and illicit drugs were used. Similar reports were seen in studies carried out globally supporting hypothesis that aphrodisiac drugs are associated with substance abuse and adverse sexual risk behavior. [24,28] Concurrent use of PDE5 inhibitors with drugs like poppers or amyl nitrates may lead to life threatening complication including heart failure and hypotension. Though these drugs should not be combined together some responders had used these drugs together. [23] Data in our study revealed that the 18.18% and 20% aphrodisiac users were homosexual and bisexual respectively. Approximately 70% population had multiple sexual partners. Among aphrodisiac users 18.18% were HIV positive and 14.55% had sexual transmitted diseases. Aphrodisiac use was found to be independently associated with an increased number of partners and was also associated with having a prevalent STD after controlling for the number of partners. These findings are consistent with other studies of HIV, STD and drug related risk behaviors among aphrodisiacs users. [31, 32] The association between drug use and increased risk of HIV infection was strongest for drugs used specifically to enhance sexual pleasure. Aphrodisiacs decreases refractory period and increases ability to have more partners in short time. Findings are limited by several factors, including the inherent limitations of an online questionnaire study design and the use of a convenience sample. An important limitation is reliance on the validity of men's responses to the interview questions.

CONCLUSION

Current evidence suggests that knowledge of aphrodisiacs drugs are quite common amongst the internet users, amongst the users, recreational uses of these drugs are very common. These drugs are associated with higher substance abuse and adverse sexual outcomes which leads to HIV and other STDS as well as multiple sexual partners. These drugs are easily available without prescription. There should be regulations for the use of these drugs as well as availability should be controlled. Given the potential for aphrodisiacs to increase risk of STI, prevention education efforts may be warranted. However further studies must be required to explore association between aphrodisiacs and STDs including HIV.

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