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Predictors of Shisha Use among Medical and Dental Students in Ibadan, Nigeria

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ABSTRACT

Background: Shisha is a form of smoked tobacco product. Medical trainees are potential stakeholders in providing accurate information about shisha and discouraging its use. However, few studies have targeted medical trainees to provide much-needed information for policymaking and planning of programs. **Aim:** To determine the prevalence and predictors of shisha use among medical and dental students in Ibadan, Nigeria. **Subjects and Methods:** A cross-sectional study was conducted among medical and dental students (n = 252) of the University of Ibadan, selected using the stratified random sampling technique. The Global Health Profession Students Survey (GHPSS) questionnaire was used to obtain information about socio-demographics, shisha and other tobacco use, and knowledge and attitude towards shisha use. The data were analyzed using Statistical Package for the Social Sciences (SPSS) version 25. Continuous data were presented using mean and standard deviation, whereas categorical variables were reported as proportions. The association between the outcome variable (shisha use) and independent variables (sociodemographic characteristics, having friends who use shisha) was measured using Pearson’s Chi-square test, and factors significant ($P < 0.05$) were entered into the multivariable logistic regression model. **Result:** The mean age (\pm SD) was 21.7 (\pm 3.1) years. Over half [136 (54%)] were males, and most [199 (79%)] were medical students. About 28 (11%) were not aware of shisha, whereas 22 (8.7%) reported they had ever used shisha. The mean knowledge score was 5.6 \pm 4.7, and 76 (33.9%) supported shisha use. Positive predictors of shisha use included the male gender [OR: 6.4 (95% CI: 1.76–23.10)] and having a friend who uses shisha [OR: 28.2 (95% CI: 5.49–144.23)]. **Conclusion:** The prevalence of shisha use among medical and dental students in Ibadan is unacceptably high, although low compared to other countries in similar resource settings. Surprisingly, the students had poor knowledge about shisha, and over a third supported its use, especially males who were more prone to use it. There is a need to design targeted health promotion and education for the students, especially males.

KEYWORDS: Africa, hookah, health sciences students, tobacco, waterpipe

INTRODUCTION

Shisha is a form of smoked tobacco, with similar constituents and health risks as other tobacco products. Shisha use has widespread acceptance and is quickly becoming a growing public health concern.^[1,2] Globally, over 100 million people use shisha daily, second only to cigarette smoking as the most common form of tobacco use.^[3] Some of the reasons shisha use is fast gaining acceptance across the world

include the erroneous belief of reduced harm,^[4–6] peer pressure,^[2] media influence, particularly advertisements and movies,^[7] availability, affordability, and the unique innovation of the shisha smoking device.^[7,8]

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Other factors include the supposed ability of shisha to alleviate social and academic stress,^[9-13] pleasure-seeking,^[14] boredom, and lack of shisha-specific policies and regulations.^[13,15] Of all the reasons, the notion that shisha is less harmful seems to be the most common reason responsible for its growing use.^[16-19] Shisha has also been reported to have better acceptance and use over cigarette smoking among medical students.^[20] Medical and dental students undergo academic, emotional, and psychological stress^[2,21,22] due to the broad curriculum and frequent examinations. Stress has also been a risk factor for shisha use among medical trainees.^[23-25]

Medical professionals and trainees are expected to play critical roles in tobacco control. To do this effectively, they must know all forms of tobacco use and their effects. Also, students in the clinical space are expected to maintain a negative attitude towards the habit and be willing to offer tobacco cessation programs to their patients. However, research shows that tobacco use among health care professionals limits their interest in interventions with smokers and their involvement in tobacco control.^[26]

Reports from studies conducted in other countries among medical personnel and trainees show that shisha use was high among doctors and dentists generally,^[4,27] especially interns, residents,^[4] and medical students.^[2,16,17,20,23,28,29] For instance, the reported prevalence of shisha use among health sciences students in Cape Town, South Africa, was 66% for ever-users, and 18% were current users.^[29] However, recent reports have indicated an upsurge in shisha use in Nigeria. Very little is known about shisha's use among medical students in the country.^[30-32] To effectively combat the upsurge of shisha use in Nigeria and prepare medical and dental trainees as stakeholders in tobacco control, it is essential to know their shisha use status and the associated factors.

Hence, this study aimed to assess the prevalence of shisha use among medical and dental students in Ibadan and determine the predictors of the habit thereof.

SUBJECTS AND METHODS

Study population

This study was conducted among medical and dental students in a tertiary institution in southwestern Nigeria. The study included all medical and dental undergraduate students from 200 level to 600 level. The ethical approval was obtained from the University of Ibadan and University College Hospital Ethical Review Committee on the 6th of February 2019 (UI/EC/18/0515).

The data were collected with the aid of a semi-structured self-administered questionnaire. The data were collected

over 2 months from February 2019 to April 2019. Students in the preclinical classes (200 level and 300 level) are located on the main campus of the University of Ibadan (UI), whereas the clinical students (400 level – 600 level) reside and have their training in the University College Hospital (UCH), Ibadan. Both UI and UCH are in Ibadan, the capital city of Oyo State.

Study design

This was a cross-sectional study designed to assess the prevalence and predictors of shisha use among medical and dental students in Ibadan, Nigeria. A minimum sample size of 227 was initially calculated using the standard formula for the estimation of sample size for descriptive studies,^[33] and using a reported prevalence of shisha use (18%) among health sciences students from Cape Town, South Africa.^[29] However, after adjusting for a possible nonresponse rate of 10%, the sample size was adjusted to a minimum of 252 students.

Sampling method

A stratified random sampling technique was used to select the study participants. The study population was stratified based on their study (Medicine and Dentistry) and course level (200 L, 300 L, 400 L, 500 L, and 600 L). Proportional allocation was used to determine the number of students to be selected from each stratum. The sampling fractions for the different classes were 0.21, 0.22, 0.21, 0.20, and 0.15 for the 200 L, 300 L, 400 L, 500 L, and 600 L, respectively. The ratio of medical students to dental students was also maintained while selecting the study participants in all the class levels. According to level and course, a list of the students was obtained, and the study participants were subsequently selected using the computer-generated random number method.

Inclusion criteria: All 200 level to 600 level medical and dental students at the College of Medicine, University of Ibadan, were included in the study.

Exclusion criteria: Medical and dental students who were not in Ibadan during the period of data collection were excluded.

Study instrument

Self-administered, semi-structured questionnaires were used for this survey. The questionnaire was adapted from the Global Health Professional Students' Survey (GHPSS)^[34] and a review of the literature.^[17,23,35,36] The questionnaire comprised the following sections, which measured: sociodemographic characteristics, shisha and other tobacco use, and knowledge and attitude towards shisha use.

Study measures

The prevalence of shisha use was assessed using a “Yes” or “No” response to the question “*Have you ever tried or experimented with shisha, even one or two puffs?*”. Likewise, the prevalence of tobacco use was determined based on the response to the question, “*Have you ever tried or experimented with cigarette smoking, even one or two puffs?*” Current cigarette smoking was assessed with the question “*During the past 30 days (one month), on how many days did you smoke a cigarette?*” Respondents that indicated 1 or more days were grouped as current cigarette smokers. Also, their use of other tobacco products was assessed with the question, “*Have you ever used other tobacco products other than cigarettes?*” The respondents’ awareness of shisha was assessed by asking if they have heard or seen shisha before. Those who chose “no” were categorized as “unaware.” Respondents unaware of shisha use were not asked further questions about their knowledge and attitude towards shisha use. Questions assessing participants’ knowledge of shisha were broadly under three main domains: *knowledge about shisha content* (seven items), *knowledge of the health effects of shisha smoking* (eight items), and two other questions on *knowledge about the regulation of shisha in Nigeria*. The options were “Yes,” “No,” and “I don’t know.” The correct answers were given a score of 1, whereas incorrect answers and “I don’t know” were awarded a 0 score. A total knowledge score was created, which is the sum of all the questions, thus giving 17. Using the mean knowledge score as the benchmark, the respondents were subsequently divided into two groups – “good knowledge” vs “poor knowledge.”

Attitude towards shisha was assessed using 18 questions, and the responses were on Likert scale (Strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree). “Strongly agree” and “agree” were grouped as “agreed,” whereas “disagree” and “strongly disagree” were grouped as “disagreed” and “neither agree nor disagree” as “unsure.” Based on the responses, those who chose positive responses were given a score of 1, whereas 0 was given for negative responses. The mean score was then used to categorize the respondents into having a positive or negative attitude.

Socio-demographic variables included age, gender (male, female), marital status (single, married), course stage (preclinical and clinical), and course of study (medicine and dentistry).

Statistical analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics were performed using frequencies and proportions, mean scores, and standard deviation

computed. Factors associated with shisha use were measured using Pearson’s Chi-square test at a level of significance set at $P < 0.05$. Furthermore, multivariable logistic regression modeling was performed using variables that were independently associated at $P < 0.10$ with ever-shisha use.

Ethical considerations

Ethical approval was obtained from the University of Ibadan and University College Hospital (UI/UCH) Ethics Review Committee (UI/EC/18/0515), and permission was obtained from the Provost’s office. In addition, written informed consent was obtained from the respondents. The anonymity of the study respondents, as well as the confidentiality of the data, was maintained.

RESULTS

Two hundred and sixty-seven eligible participants were approached, and 255 responded, giving a response rate of 95.5%. However, three of the questionnaires were not filled appropriately, with a significant number of missing responses. These were removed, leaving a total of 252 participants whose data were analyzed.

Table 1: Socio-demographic characteristics and tobacco use habits of medical and dental students at the College of Medicine, University of Ibadan, 2019

Variables	Frequency (n=252)	Percentage (%)
Age range (years)		
≤19	55	21.8
20-24	175	69.4
≥25	22	8.8
Gender		
Male	136	54.0
Female	116	46.0
Class Level		
Pre-clinical (200 L - 300 L)	109	43.2
Clinical (400 L, 500 L, 600 L)	143	56.8
Course of study		
Medicine	199	79.0
Dentistry	53	21.0
Religion		
Christianity	220	87.3
Islam	30	11.9
Others	2	0.8
Tribe		
Yoruba	188	74.6
Igbo	33	13.1
Hausa	2	0.8
Others*	29	11.5
Marital status		
Single	248	98.4
Married	4	1.6

*Others include Edo, Uhrobo, Efik

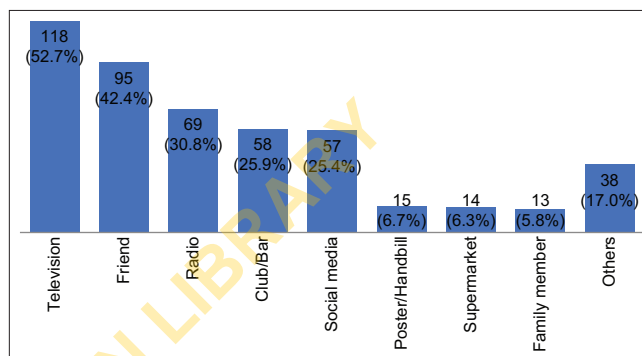
Table 2: Knowledge of shisha among medical and dental students at the College of Medicine, University of Ibadan, 2019

Shisha contains the following	Frequency (224)	Percent (%)
Nicotine		
No/I do not know	131	58.5
Yes	93	41.5
Tobacco		
No/I do not know	128	57.1
Yes	96	42.9
Carbon monoxide		
Yes	81	36.2
No/I do not know	143	63.8
Dangerous metals		
No/I do not know	161	71.9
Yes	63	28.1
Tar		
No/I do not know	165	73.7
Yes	59	26.3
Aromatic hydrocarbons		
Yes	60	26.8
No/I do not know	10	4.5
Do not know	154	68.7
The liquid may be alcohol		
No/I do not know	191	85.3
Yes	33	14.7
Cardiovascular diseases		
No/I do not know	123	54.9
Yes	101	45.1
Cancer		
Yes	73	32.6
No/I do not know	151	67.4
Risk of infections		
No/I do not know	157	70.1
Yes	67	29.9
Low birthweight		
No/I do not know	122	54.5
Yes	102	45.5
Gum diseases		
No/I do not know	134	59.8
Yes	90	40.2
Eye diseases		
No/I do not know	204	91.1
Yes	20	8.9
Second-hand smoke is harmful		
Yes	98	43.7
No/I do not know	126	56.3
Medical evidence ill-health		
Yes	110	49.1
No	114	50.9
The sale of shisha to people below 18 years is currently banned in Nigeria		
No/I do not know	175	78.1
Yes	49	21.9

Contd...

Table 2: Contd...

Shisha contains the following	Frequency (224)	Percent (%)
Shisha is an illegal product in Nigeria		
No/I do not know	180	80.4
Yes	44	19.6
Overall knowledge of shisha	Maximum score (17)	Mean=5.6 (±4.7)
Poor knowledge	116	58.0
Good knowledge	108	42.0

**Figure 1:** Different sources of information about shisha among the medical and dental students at the College of Medicine, the University of Ibadan who were aware of its use**Socio-demographic characteristics of the respondents**

The mean age (\pm SD) of the respondents was 21.7 (\pm 3.1) years. About two-thirds (69.4%) of the respondents were aged between 20 and 24 years old, over half were males (54%), and over three-quarters (79%) were studying medicine [Table 1].

Knowledge attitude and awareness of shisha

A total of 224 (88.9%) respondents had heard (aware) of shisha, and the three most common sources of information were via the television (52.7%), friends (42.4%), and radio (30.8%) [Figure 1].

Table 2 shows that among the 224 respondents who had heard about shisha, the mean (\pm SD) knowledge score was 5.6 (\pm 4.65) out of 17. Overall, 58.0% of the study participants had below the mean score for this population and categorized as having poor knowledge about shisha contents and effects. Less than half (42.9%) of the respondents knew that shisha contains tobacco, and only 32.7% knew that shisha use is linked to cancer. The majority (85.3%) of the respondents either disagreed or were unsure that the liquid in shisha could be replaced with alcohol.

Table 3 shows that, overall, one out of every three students supported the use of shisha. About one-quarter did not believe that shisha use is bad, and it is not

Table 3: Attitude of medical and dental students at the College of Medicine, the University of Ibadan towards shisha use, 2019

Variables	Frequency (n=224)	Percent (%)
Health professionals should routinely advise patients who smoke a cigarette to quit		
Agree	199	88.8
Disagree/Undecided	25	11.2
Health professionals should routinely advise patients who smoke shisha to quit		
Agree	194	86.6
Disagree/Undecided	30	13.4
Health professionals should get specific training on shisha-use cessation techniques		
Agree	186	83.0
Disagree/Undecided	38	17.0
Health professionals serve as "role models"		
Agree	181	80.8
Disagree/Undecided	63	20.2
Patient's chances of quitting shisha use will increase if a health professional advises him or her to quit		
Agree	149	66.5
Disagree/Undecided	75	33.5
It is difficult to quit using shisha		
Agree	72	32.4
Disagree/Undecided	150	67.6
Shisha use is more socially acceptable compared to cigarettes		
Agree	116	51.8
Disagree/Undecided	108	48.2
Shisha use is less attractive to cigarette smoking		
Agree	19	8.5
Disagree/Undecided	205	91.5
Females are more comfortable to use shisha compared to cigarettes		
Agree	116	51.8
Disagree/Undecided	108	48.2
Males are more comfortable to use shisha compared to cigarettes		
Agree	85	37.9
Disagree/Undecided	139	62.1
Shisha is safe because the smoke is filtered through water		
Agree/Undecided	122	54.5
Disagree	102	45.5
Shisha use is not good for the health		
Agree	169	75.4
Disagree/Undecided	55	24.6
Shisha use is a bad habit		
Agree	171	76.4
Disagree/Undecided	53	23.6
Shisha use is less harmful than cigarette smoking		

Contd...

Table 3: Contd...

Variables	Frequency (n=224)	Percent (%)
Agree/Undecided	120	53.6
Disagree	104	46.4
There should be a complete ban on the advertising of shisha		
Agree	142	63.4
Disagree/Undecided	82	36.6
Shisha should not be sold to adolescents (younger than 18 years old)		
Agree	179	79.9
Disagree/Undecided	45	20.1
Laws regarding cigarette smoking should apply to shisha use		
Agree	170	75.9
Disagree/Undecided	54	24.1
I will encourage others to quit shisha		
Agree	183	81.7
Disagree/Undecided	41	18.3
Overall attitude to shisha use		
Oppose	148	66.1
Support	76	33.9

Table 4: Shisha habit among medical and dental students in Ibadan, Nigeria, 2019

Variables	Frequency	Percentage (%)
Ever-use	(n=252)	
Yes	22	8.7
No	230	91.3
Source of first shisha	(n=22)	
Friend	14	63.6
Self-acquired	5	22.7
Relative	2	9.2
Others	1	4.5
Ever-use by family	(n=224)	
Yes	17	7.6
No	128	57.1
Do not know	79	35.3
Ever-use by friend	(n=224)	
Yes	69	30.8
No	84	37.5
Do not know	71	31.7
Pressured to use shisha	(n=224)	
Yes	16	7.1
No	208	92.9
Most favourite flavour?	(n=22)	
Any flavour	9	40.9
Strawberry	4	18.2
Mint	1	4.5
Do not know	8	36.4

good for their health. Less than half of the respondents disagreed that "shisha use is safe because the smoke is filtered through water." Generally, over 80% of the students thought that health professionals should

Table 5: Factors associated with shisha use among medical and dental students in Ibadan, Nigeria, 2019

Variable	Yes n (%)	P
Gender		
Male	18 (13.2)	0.006*
Female	4 (3.4)	
Living arrangement		
Alone	7 (18.4)	0.022*
With Friends/Family	15 (7.0)	
Overall knowledge		
Poor	8 (6.2)	0.030*
Good	14 (14.9)	
Current cigarette		
No	18 (7.3)	<0.001*†
Yes	4 (100.0)	
Ever cigarette		
Yes	15 (71.4)	<0.001*†
No	7 (3.0)	
Ever-shisha use by family		
No/Do not know	16 (7.9)	<0.001*
Yes	6 (35.3)	
Ever-shisha use by friends		
No/Do not know	2 (1.3)	<0.001*
Yes	20 (29.0)	

*Significant; †Fisher's exact test

Table 6: Predictors of shisha use among medical and dental students in Ibadan, Nigeria, 2019

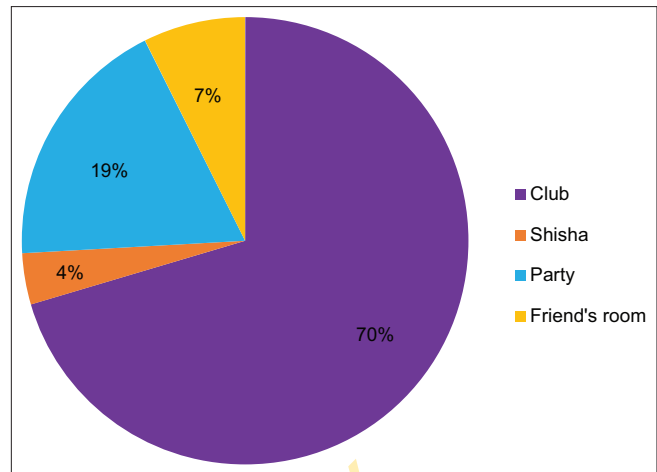
Variable	Odds ratio	95% CI
Gender		
Male	6.39	1.76-23.10
Female (Ref)	1.00	
Ever shisha use by friends		
Yes	26.00	5.55-121.71
No (Ref)	1.00	

R-Square: 0.466; Ref=Reference category

routinely advise people to avoid using shisha and acquire shisha-specific cessation training. Over half (51.8%) of the respondents believed that shisha use is more socially acceptable than cigarettes, and the majority (71.0%) of the respondents believed that shisha is preferred over a cigarette as a form of tobacco use. Three-quarters (75.9%) believed shisha should not be sold to adolescents, 63.4% wanted a complete ban on advertisement, and 79.9% wanted the same laws applied to cigarette smoking and shisha use.

Shisha use

Twenty-two (8.7%) respondents had used shisha, out of which 15 (63.6%) were initiated by their friends. Most of the respondents, [19 (70.4%)] usually smoked in the club [Figure 2]. Sixty-nine (31.4%) and 17 (7.7%) respondents had a close friend and family member, respectively, who used shisha [Table 4].

**Figure 2: Different locations where shisha users had used shisha**

Factors associated with shisha use

Table 5 shows that a higher proportion of males [18 (13.2%)] reported shisha use compared to females [4 (3.4%)], and this difference in proportions was statistically significant ($P < 0.05$). Likewise, a higher proportion of respondents who had friends [20 (29.0%)] and families [6 (35.3%)] who used shisha reported shisha use ($P < 0.05$). A statistically significantly higher proportion of respondents who had smoked cigarettes [15 (71.4%)] reported shisha use compared to nonsmokers [7 (3.0%)] ($P < 0.05$). Following multivariate logistic regression analysis, factors predictive of shisha use among the respondents were being a male [OR: 6.4 (95%CI: 1.76–23.10)] and having a friend who smoked shisha [OR: 28.2 (95%CI: 5.49–144.23)] [Table 6].

DISCUSSION

This study found that awareness of shisha use and knowledge about its contents and health effects was suboptimal. The proportion of the students who had used shisha is relatively low compared to the report from similar studies done in other parts of the world – South Africa with 66.0%,^[29] Canada with 39.9%,^[17] Pakistan with 22.8%,^[28] 19.3%,^[16] and 14%.^[2] A possible reason for this lower prevalence is that tobacco use is generally relatively lower in Nigeria compared to some other low- and middle-income countries (LMICs).^[37] Interestingly, the respondents who had smoked cigarettes were more likely to report shisha use than noncigarette smokers. This affirms studies that have shown an association between cigarette smoking and other forms of tobacco, such as shisha.^[38]

Also, unlike the males, a higher percentage of females had attempted using shisha compared to cigarettes. This corroborates findings from other studies that a higher

proportion of females than males prefer shisha use over cigarette smoking.^[16,20,28,39,40] Likewise, the age of first shisha use ranged from 15 to 25 years old, similar to a study in Pakistan with 18–24 years.^[16] This finding implies that, on average, uptake of shisha use among this population is more of a recent occurrence, as their mean age was 21.7 (\pm 3.1) years. This is understandable considering that shisha use is also new in the country.

Similar to previous research, predictors of shisha use were the male gender^[16,20,28,41] and having friends who use shisha.^[28,42] Thus, these must be considered when planning tobacco control interventions among this group.

Overall, the level of knowledge of the study participants was very low. This is of concern because medical and dental students often serve as a source of health information to other students in the university. Considering that shisha use is quite new in Nigeria with numerous conflicting information about its health effects, medical and dental students are in an excellent position to provide the needed clarifications on these and other shisha-related questions to their peers. Hence, they should have adequate knowledge about it themselves.

The attitude towards a particular behavior is a strong indication of the likelihood of engaging or rejecting such behavior.^[42,43] Considering that shisha smoking is an unhealthy habit with associated health consequences, it would be expected that those who would play key roles in this regard should have an attitude that rejects shisha use and supports its regulation. This study, however, showed that one out of every three medical and dental students supported shisha use, and one in every four believed that shisha use is safe. The result from this study is also in tandem with the notion that compared to cigarette smoking, shisha use is more accepted among females,^[44] with the majority (51.8%) in this study agreeing with the statement in the questionnaire that *females are more comfortable to use shisha compared to cigarettes*.

This study is not without its limitations being a cross-sectional study design, causality cannot be inferred. However, as we did not set out to find out causality but associated factors, we do not think this is a problem. Furthermore, the information provided was self-reported and prone to under-reporting, especially among those who may be engaged in the habit of smoking and who do not want others to know about it. In a bid to minimize possible under-reporting, the respondents were assured that their responses were anonymous and cannot be traced back to them. Lastly, some of the information requested was about events that may have occurred in the past and is prone to recall bias. Although considering

that initiating shisha use would be a unique experience to any of the respondents, it is not likely that they would have any problem recalling such an event.

CONCLUSION

The prevalence of shisha use among medical and dental students in Ibadan is relatively low compared to other LMICs. However, their knowledge about shisha was sub-optimal, and a third of the students supported shisha use. There is a need to educate the students about shisha use. The result of the study will contribute to the development of tobacco (shisha) control measures, stimulate further research, and increase the consciousness of the participants as well as other medical and dental students about shisha and its health effects.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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