https://doi.org/10.47811/bhj.36

Penile implantation and risky sexual behaviour among male clients of female sex workers, Myanmar

Sun Tun[1], Tin Aung[2], May Sudhinaraset[3], Zaw Win[4], Willi McFarland[5]

[1,2,4]*Population Services International Myanmar, Yangon, Myanmar*

[3]*University of California Los Angeles, USA*

[5]*University of California San Francisco, USA*

ABSTRACT

Introduction: Male clients of female sex workers are at risk for sexually transmitted infections worldwide, yet their behaviours are seldom described in community-based samples. In addition, physical modifications to the penis, such as injections and implantations of objects to enhance sensation, have been noted in diverse cultures. The objective of the present study was to examine risk behaviours of male clients of female sex workers in Myanmar and assess associations between penile modifications and risk for sexually transmitted infections. **Methods:** A cross-sectional survey was conducted in 2010 in seven cities of Myanmar. The design used probability proportionate to size sampling of male clients at sex work venues (e.g., brothels, entertainment centres, streets) to approximate a representative sample. **Results:** Of 2,945 male clients at sex work venues, 2,740 (93.0%) enrolled. Overall, 9.9% reported penile injections and 10.7% reported implantations. Compared to male clients without penile modifications, those with penile injection or implantation had higher numbers of partners and more episodes of unprotected sex with casual and commercial partners. Condom breakage and history of sexually transmitted disease symptoms were also higher among male clients with penile modifications. **Conclusions:** Modifications of the penis mark a constellation of risky behaviours among male clients of female sex workers in Myanmar and may also be causally related to sexually transmitted infections through condom breakage or physical effects on the penis. Health education and counselling on the potential increased risk should be considered for men with penile modifications.

Keywords: Myanmar; Penile implantation; Sex behaviour; Sex worker clients.

INTRODUCTION

Female sex workers (FSW) are at high risk for HIV and other sexually transmitted diseases (STI) worldwide. A recent review estimates FSW are more than 13 times likely to be HIV-infected compared to the general population[1]. The regions of South and South East Asia have not been spared. HIV prevalence has been measured at 25.7% in India[2] and 11.9% in Thailand[3] – two countries that border Myanmar. In Myanmar, a recent small survey found 18.4% of FSW were HIV-positive[4]. By extension, the male clients of FSW may also be at elevated risk for STI and HIV if condom use and other preventive practices are inconsistent. However, there are fewer population or community based studies on the behaviours and practices of male clients of FSW.

One practice that may affect risk for STI and HIV among male clients of FSW is the physical modification of the penis. Implantations and injections into the penis have been documented in Asian cultures and occasionally in the Western world[5]. Penile implantations are surgical procedures in which metallic, ceramic, or silicone balls are placed subcutaneously.

The practice appears common among inmates and soldiers in Southeast Asia as a means of enhancing their sexual prowess by increasing the size and roughness of the penis[6]. Oil injection into the penis for similar purposes may also occur in the region. A survey in 1999 among migrant Myanmar fishermen in Thailand found that 7.5% reported penile oil injections and 12.4% reported penile implantation[7], suggesting that the prevalence of these practices could be substantial. However, it is not known if these penile modifications are common among the clients of FSW, if they create problems for consistent and proper condom use, or if they are associated with increased risk for STI and HIV in Myanmar[8].

We conducted a cross-sectional survey among the male clients of FSW in seven cities in Myanmar. The main objectives of the present analysis are to 1) document the prevalence of penile injection and implantation practices in this population, and 2) determine the relationship between penile modification, sexual risk behaviours, and STI.

Corresponding author:
Willi McFarland
willimcfarland@ucsf.edu

METHODS

The study was a cross-sectional survey carried out in seven cities in Myanmar in 2010 among men who reported visiting an FSW in the past month. The study protocol was reviewed and approved by the Population Services International Research Ethics Board (protocol number MYA-06-10-14).

The sampling design was probability proportionate to size implemented in the following manner. First, seven cities were selected to obtain geographic diversity of the country: Yangon, Mandalay, Myitkyina, Monywar, Tarchileik, Pyay, and Bago. Second, the composition of the sample was calculated to be proportionate to the number of men age 15 to 49 years in the seven cities, encompassing a total population of 1,297,5059. Third, in each city the field team mapped the venues, days of the week, and times of the day where FSW were known to solicit clients, including hotels, brothels, massage parlours, streets, and other public spaces. The number of male clients present was estimated at each venue-day-time period. Fourth, recruitment events were conducted at randomly selected venue-day-time periods (i.e., as primary sampling units or PSU) with the probability of selection of the PSU proportionate to the estimated number of male clients present. Fifth, at the recruitment event, the field team approached men, determined their eligibility, and if eligible and willing obtained informed consent.

Structured interviews were conducted face-to-face by trained staff in a private area near the venue. Participants provided information on demographic characteristics, sexual encounters during the past 12 months, and condom use and condom breakage. They were also asked if they had experienced STI-related symptoms such as urethral discharge and ulcers. Penile modifications, including injection of silicon or other substances and implantation of metal beads or other objects, were by self-report following discussion with the interviewer. The questionnaire was pilot-tested for clear understanding and suitability for respondents in their local languages prior to implementation.

Descriptive data are presented as counts, proportions, and means. To examine differences in sociodemographic and risk factors among those with and without penile modifications, the Pearson's Chi squared test was used for proportions, the non-parametric Wilcoxon Rank-sum test was used rank-ordered variables and those not normally distributed, and a t-test was used for continuous variables. Multiple logistic regression models were used to characterize independent associations with penile modifications. A p-value less than 0.05 was considered statistically significant.

RESULTS

Within the seven cities, a total of 1,207 FSW venues and hotspots were identified including 453 entertainment centres, 399 street areas, and 355 institutional locations. During the study period, 3,391 men in the vicinity of the hotspots were approached, 2,945 (86.8%) were screened as eligible male clients, and 2,740 (93.0%) male clients were interviewed.

Of male clients, 270 (9.9%) reported penile injection, 292 (10.7%) reported penile implantation, and 23 (0.8%) reported both injection and implantation. Table 1 describes the male clients interviewed and compares the demographic characteristics of male clients with no penile modification to those with injection and implantation. Male clients with penile injections (56.7%) or implantations (56.2%) were more likely to be in Yangon than male clients without penile modifications (46.8%). Male clients with injections or implantations were also older than those without penile modifications (mean age 30.1, 29.8, and 28.2 years, respectively). Male clients without penile modifications tended to have higher levels of education compared to those with implantations. A higher proportion of male clients with injections (48.9%) and implantations (45.9%) were currently married compared to male clients without penile modifications (43.3%). Monthly income was higher among male clients with injections and implantations than those without penile modification.

Broadly, sexual risk behaviours were higher among male clients with injection or implantation compared to clients without penile modification, including higher mean number of partners, lower condom use at last sex with a non-marital non-cohabitating partner, and more episodes of unprotected sex with commercial partners (Table 2). Breakage of condoms during sex with a commercial partner was more common among male clients with injections (24.6%) and implantations (22.9%) than those without penile modifications (9.9%). STIs also appear more common among male clients with penile modifications with 15.6% of men with injection and 17.5% of men with implants reporting genital discharge or ulcer in the last 12 months compared to 9.3% of male clients without penile modifications. However, being told by a health provider that they had an STI was only borderline higher among male clients with penile injections or implantations. Nonetheless, HIV testing in the last 12 months was higher among male clients with injections (42.2%) and implantation (44.2%) compared to those without penile modifications (33.9%). Notably, circumcision was more common among male clients with injections (18.0%) and implantations (25.0%) than among clients without penile modifications.

Table 3 shows independent correlates of penile injection and implantation by multivariate logistic regression analysis. Male clients with penile injections were less likely to reside outside of the main cities of Yangon and Mandalay, to be older, and to have higher monthly income. Male clients with penile implantations were also less likely to reside outside of Yangon and Mandalay, to be older, and to have higher income. In addition, penile implantation was also associated with lower education level and not being currently married.

Table 1. Characteristics of male clients of female sex workers by penile modifications, Myanmar, 2010 (*n*=2,740)

Variable	All male clients N (%)	Male clients without modification N (%)	Penile injection N (%)	p-value injection vs. no modification[1]	Penile implantation N (%)	p-value implantation vs. no modifica-tion[1]
Total	2,740 (100)[2]	2,201 (100)[2]	270 (100)[2]	--	292 (100)[2]	--
City						
Yangon	1,330 (48.5)	1,030 (46.8)	153 (56.7)		164 (56.2)	
Mandalay	650 (23.7)	509 (23.1)	77 (28.5)		69 (23.6)	
Myitkyina	180 (6.6)	166 (7.5)	5 (1.9)	<0.001	9 (3.1)	<0.001
Monywar	150 (5.5)	148 (6.7)	2 (0.7)		0 (0.0)	
Tachileik	90 (3.3)	69 (3.1)	12 (4.4)		9 (3.1)	
Pyay	180 (6.6)	147 (6.7)	14 (8.7)		19 (6.5)	
Bago	160 (5.8)	132 (6.0)	7 (5.2)		22 (7.5)	
Age (mean in years)	28.6	28.2	30.1	<0.001	29.8	<0.001
Education						
No schooling	31 (1.1)	28 (1.3)	0 (0.0)		3 (1.0)	
Monastic	38 (1.4)	32 (1.5)	2 (0.7)		4 (1.4)	
Primary	307 (11.2)	241 (10.9)	23 (8.5)	0.057	48 (16.4)	0.004
Middle	935 (34.1)	731 (33.2)	100 (37. 0)		112 (38.4)	
High	784 (28.6)	635 (28.9)	88 (32.6)		68 (23.3)	
Matriculated	463 (16.9)	384 (17.4)	39 (14.4)		42 (14.4)	
Diploma, degree, post-graduate	182 (6.6)	297 (13.5)	18 (6.6)		15 (5.1)	
Marital status						
Never married	1,330 (48.5)	1,100 (49.9)	103 (38.2)		131 (44.9)	
Currently married	1,202 (43.9)	952 (43.3)	132 (48.9)	<0.001	134 (45.9)	0.021
Living together	32 (1.2)	28 (1.3)	2 (0.7)		2 (0.7)	
Divorce or separated	153 (5.6)	103 (4.7)	28 (10.4)		25 (8.6)	
Widower	23 (0.8)	18 (0.8)	5 (1.9)		0 (0.0)	
Income (mean kyat/ month)	160,331	154,187	199,625	<0.001	171,193	0.0172

[1]Chi-square test for proportions; Wilcoxon rank sum test or t-test for continuous variables.[2]Categories do not always add to total due to missing data; calculations are made from those with a response (i.e., non-missing or non-skip pattern). 1,000 kyat was approximately 1 USD at the time of the survey.

Table 2. Risk-related characteristics of male clients of female sex workers by penile modifications, Myanmar, 2010 (*n*=2,740)

Variable	All male clients N (%)	Male clients without modification N (%)	Penile injection N (%)	p-value injection vs. no modification[1]	Penile implantation N (%)	p-value implantation vs. no modification[1]
Number of sex partners, last 12 months (mean)	11.2	10.4	16.0	<0.001	13.4	<0.001
Condom use at last sex with non-marital, non-cohabiting partner	2,496 (91.1)	2,028 (92.1)	236 (87.4)	0.008	245 (83.9)	<0.001
Episodes of unprotected sex with commercial partners, last 12 months (mean)	0.3	0.2	0.5	<0.001	0.6	<0.001
Any condom breakage with commercial partners	329 (12.5)	210 (9.9)	64 (24.6)	<0.001	62 (22.9)	<0.001
Reported penile discharge or ulcer, last 12 months	290 (10.6)	204 (9.3)	42 (15.6)	0.001	51 (17.5)	<0.001
Was told by health provider had STI, last 12 months	141 (5.2)	105 (4.8)	20 (7.4)	0.062	21 (7.2)	0.076
Tested for HIV, last 12 months	975 (35.6)	745 (33.9)	114 (42.2)	0.006	129 (44.2)	0.001
Circumcised	189 (6.9)	123 (5.6)	27 (18.0)	0.004	41 (25.0)	<0.001

[1]*Chi-square test for proportions; Wilcoxon rank sum test or t-test for continuous variables. Categories do not always add to total due to missing data; calculations are made from those with a response (i.e., non-missing or non-skip pattern).*

Table 3. Independent correlates of penile injection and implantation among male clients of female sex workers in Myanmar, 2010 (*n*=2,740)

Variable	Injection: adjusted odds ratio (95% confidence interval)	p-value	Implantation: adjusted odds ratio (95% confidence interval)	p-value
City				
Yangon	Referent		Referent	
Mandalay	1.0 (0.7-1.3)	<0.001	0.8 (0.6-1.1)	0.005
Other cities	0.4 (0.3-0.6)		0.5 (0.4-0.7)	
Age group (years)				
18-24	Referent		Referent	
25-34	2.1 (1.4-3.1)	<0.001	1.5 (1.1-2.1)	0.002
35-49	2.3 (1.5-3.6)		1.6 (1.1-2.5)	
Education				
Primary or monastic	Referent		Referent	
No schooling	--	0.075	0.6 (0.5-1.0)	0.003
Middle school	1.3 (0.8-2.2)		0.7 (0.5-1.0)	
High school and above	1.3 (0.8-2.0)		0.5 (0.3-0.7)	
Married (vs. other)	0.9 (0.7-1.2)	0.080	0.8 (0.6-1.0)	0.046
Income (per kyat)	1.001 (1.001-1.002)	0.007	1.001 (1.000-1.001)	0.016

1,000 kyat was approximately 1 USD at the time of the survey.

DISCUSSION

Our large, community-based survey of male clients of FSW in several cities of Myanmar found approximately one in ten had made physical modification to their penises, including injections and implantations. These modifications marked an increase likelihood of engaging in multiple sexual risk behaviours. Men with penile modifications reported more sex partners, lower likelihood of condom use, and more episodes of unprotected sex with FSW. These behaviours can in turn lead to increased acquisition of STI. Indeed, history of penile discharge and genital ulcer were significantly higher among the male clients with penile modifications.

In addition to the increased behavioural risk, a causal relationship between penile modification and STI risk might be hypothesized. For example, men with penile modifications were more likely to report condom breakage. In our survey condom breakage in the last year was reported by one in four men with penile modifications, more than twice as high as reported by men without penile modifications. Condom breakage experience from another survey was reported at 15% and was significantly correlated with past STI[10]. Additionally, increased size, distortion of shape, inflammation, and enhanced texture of the modified penis may affect the likelihood of STI acquisition. However, our cross-sectional survey and interviews are unable to prove such a causal effect. Longitudinal studies, including before and after the modifications, may be needed to establish a causal effect along with detailed studies of changes to anatomy and mucosa. Moreover, qualitative research is needed to better understand context and risk perceptions for these men.

Although men with penile modifications were significantly more likely to report symptoms of STI, they were only slightly (and not significantly) more likely to have been diagnosed for STI by a health provider. This discrepancy suggests health education programs are needed to reach men with penile modifications, counsel them on their potential increased risk for STI, and encourage STI screening. It is encouraging to find that men with penile modifications were more likely to test for HIV in the last year, indicating they may be receptive to increased STI screening as well. Our data provide some guidance on where and who outreach programs can target. For example, although men with penile modifications were found in all cities, they were much more common in the Myanmar's two largest cities of Yangon and Mandalay.

In addition to uncertainties on causal inference as noted above, there are other limitations of our study. First, the reports of penile modification, sexual behaviours, and STI symptoms were self-report and not confirmed by physical examination or laboratory tests. Related to this limitation, specific description of the type of substance injected, the type and number of beads implanted, or side effects and complications of the modifications were limited. A second limitation is that since this study was conducted among the clients of female sex workers it is not representative of the general population of men in Myanmar.

Third, the sampling design used is not a true population-based method as there is no complete roster or sampling frame of all male clients of FSW to from which to randomly select. We hold that our approach was a reasonable approximation of a probability-based method, similar to behavioural surveys conducted elsewhere in the world[11]. Finally, there may be some duplication of participants if they were approached more than once during data collection. To minimize such bias, respondents were asked if they had participated in a similar survey in the preceding four weeks.

CONCLUSIONS

In summary, the present study identified risky sexual behaviour among male clients of FSW with elevated risk and history of STI among clients with penile modifications. Our study can alert health providers, outreach educators, and other groups working with FSW and their clients to the potential added risk of penile modifications for STI and HIV acquisition. Our findings can be incorporated into programs for community education, counselling, screening, and treatment of STI.

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AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

ST: Concept, design, literature search, data collection and analysis, manuscript writing and review.

TA: Concept, analysis of data, study design, manuscript drafting and revision

MS: Concept, analysis of data, study design, manuscript drafting and revision

ZW: Concept, analysis of data, study design, manuscript drafting and revision

WF: Concept, analysis of data, study design, manuscript drafting and revision

Author agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None

GRANT SUPPORT AND FINANCIAL DISCLOSURE

Population Services International - Myanmar