

Transgenders are the most vulnerable amongst individuals engaging in receptive anal intercourse: A cross-sectional study from North India

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ABSTRACT

Background: In India, sexuality not confirming to hetero-conjugal and peno-vaginal norm is abhorred and discriminated against. Individuals engaging in Receptive Anal Intercourse (RAI) are marginalized. Reappraisal of their sexual health conditions is likely to promote inclusive health care. **Methods:** Eighty-five consenting adults with RAI history were recruited from a tertiary care hospital in Delhi. Clinico-demographic data was noted and anal cytology samples were reported by Bethesda 2014 terminology. **Results:** There were 29 transgenders (TGs), 51 males (31 bisexual) and five females. Fifty-four subjects were Human Immunodeficiency Virus (HIV) infected (22 TGs, 31 males (17 bisexual) and one female) and 52 were receiving anti-retroviral treatment (ART). Thirty-one subjects had anal warts (6 TGs, 20 males, five females). Anal cytology revealed squamous intra-epithelial lesions (SIL) in 20 (5 TGs, 13 males, two females). TGs had significantly riskier sexual practices than homosexual males, bisexual males and females, with consistently earlier age of first RAI exposure and frequent childhood (≤ 16 years) RAI experience compared to homosexual males, bisexual males and females, even after stratification by HIV status, warts and SIL. **Conclusions:** TGs had the highest sexual health risk profile including higher frequency of HIV infection compared to other subjects with RAI history. Bisexuality was common; their risk profile was variably lower than homosexual males. Mindfulness of above is likely to help overcome barriers to health care access and promote compassionate approach at all levels including primary care physicians.

Keywords: Anal cytology, HIV, men who have sex with men, primary care physicians, receptive anal intercourse, transgender

Introduction

Receptive Anal Intercourse (RAI) refers to sexual behaviour of receptive partner in men who have sex with men (MSM) including transgenders (TGs) and females with peno-anal contact. Unprotected RAI markedly increases likelihood for acquiring

Human Papilloma Virus (HPV) and Human Immunodeficiency Virus (HIV). High-risk HPVs are aetiologically linked to anal squamous intra-epithelial lesions (SIL) and HIV is a major determinant for its development and progression.^[1] Compared to the general population where anal squamous cell carcinoma (SCC) is uncommon, HIV positivity enhances its odds considerably (odds ratio = 28.75). Incidence in HIV positive MSM is even higher (78 times).^[2] Anal cytology (AC) is an inexpensive and opportune tool to screen for anal SIL. It significantly reduces the incidence of anal SCC in HIV-infected people. Lack/refusal to screen has been associated with up to 5-fold increase in incidence.^[3] Ironically, these high-risk

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How to cite this article: Arora T, Wadhwa N, Pandhi D, Diwaker P, Arora VK. Transgenders are the most vulnerable amongst individuals engaging in receptive anal intercourse: A cross-sectional study from North India. *J Family Med Prim Care* 2021;10:4463-70.

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Received: 03-04-2021

Revised: 17-07-2021

Accepted: 19-07-2021

Published: 27-12-2021

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_634_21

individuals are largely unaware of the risk of anal cancer and anal cytology screening services remain under-utilized.^[4]

Sexual relations between men and RAI are taboo in India. The prevalence of HIV in Indian MSM (2.7%) and TGs (3.1%) is disproportionately higher, surpassing female sex workers (1.6%).^[5] Despite overall decline in national HIV burden, persistent sectarian distribution of HIV in MSM underpins their social marginalization in Indian society.^[6] Stigmatization and mistreatment of sexual minority populations is common across many cultures.^[7] Social and family acceptance and safe community environment have strong association with improved health conditions.^[8,9] Fear of anticipated discrimination and disparity in access to health facilities is an universal phenomenon.^[10-13] The ongoing COVID-19 pandemic has made the gender minority population more vulnerable.^[14] Primary care physicians play an important role in bridging these gaps owing to their closer community outreach.^[15] In the present study, we evaluated the clinico-demographic data of individuals engaging in RAI and sought correlation, if any, with HIV status and clinico-morphologic evidence of HPV infection.

Methods

This cross-sectional analytical study was done in a teaching tertiary level hospital in New Delhi after obtaining clearance from the Institutional Ethical Committee-Human Research. The study sample size was calculated from previously reported range of SIL frequency (27.7% in a previous study from our institution and 18.4%-53% in other studies).^[16-18] Considering an average frequency of 30% with 10% precision error on both sides and 95% confidence level, a sample size of 81 subjects would have been adequate. Eighty-six adult (>18 years of age) consenting subjects with history of RAI were recruited. Written informed consent was obtained from all participants. Subject anonymity and confidentiality were maintained. Sexual identity and orientation were recorded as TGs/male/female and homosexual/bisexual/heterosexual, respectively. Sexual practice details were elicited with a set questionnaire. Condom use was elicited as never, inconsistent and consistent. Labelling of condom use as consistent or inconsistent was based on subject's description as either used in almost every intercourse or missed on several occasions. Subjects who are able to read and/or write in any language were considered literate. HIV status was available/determined for all. Presence of anal/perineal/genital warts was recorded on local examination.

Specimen for conventional AC was collected using a moistened cyto-brush by standard technique. Papanicolaou stained smears were reported in accordance with 2014 Bethesda reporting system.^[19] The diagnoses were classified as follows: Unsatisfactory for evaluation/negative for intra-epithelial lesion or malignancy (NILM)/SIL, namely atypical squamous cells of unknown significance (ASC-US), low-grade squamous intra-epithelial lesion (LSIL), high-grade squamous intra-epithelial

lesion (HSIL) and atypical squamous cells, cannot rule out HSIL (ASC-H).

Statistical analyses were performed with Statistical Package for Social Sciences (SPSS) version 20 (SPSS, Chicago, Illinois, USA). Chi-square/Fischer's exact test was used to determine the correlation between clinico-demographic parameters and SIL. The quantitative data was analysed by unpaired Student's *t*-test. Odds ratio (OR) was calculated by logistic regression analysis. The differences were considered statistically significant when *P* value was <0.05.

Results

Eighty-six subjects with history of RAI were recruited. One case was excluded as found unsatisfactory for evaluation. Results of 85 subjects are detailed further [Table 1]. There were 80 MSM (29 TGs, 51 non-TG males: 31 bisexual and 20 homosexual males) and five females. Compared to non-TGs and females, TGs had significantly higher number of life-time sex partners (SP) ($P < 0.01$), RAI duration and frequency ($p \leq 0.02$). The proportion of TGs with first RAI exposure before attaining adulthood (18 years) and childhood RAI experience (age ≤ 16 years) (75.9% and 68.9%) were significantly higher than non-TGs (25.5% and 19.6%) and females (none for both) ($p \leq 0.008$ for all comparisons). More than one-half of males reported bisexual behaviour. Compared to TGs, bisexual males had fewer life-time SP, lower RAI frequency and higher age of first RAI exposure ($p \leq 0.02$). They were also less likely to have experienced RAI in childhood (19.3%) than TGs ($P = 0.0002$). Comparison of bisexual and homosexual males showed variable level differences. Condom use was largely inconsistent across various sub-groups. Only 3/29 TGs, 1/20 homosexual males, 2/31 bisexual males and 2/5 females reported consistent condom use. Illiteracy was significantly more frequent in TGs compared to both males and females. None of the subjects gave a history of intra-venous drug abuse.

Fifty-four subjects were HIV infected and 52 were receiving anti-retro viral treatment (ART). HIV-infected subjects had significantly higher number of life-time SP, RAI duration, 'never condom use' and were more likely to be illiterate compared to HIV-negative subjects [Table 2]. Within the HIV-infected group, TGs had significantly more life-time SP and earlier age of first exposure to RAI than males ($P = 0.009$ and $P = 0.0001$ respectively) and bisexual males ($P = 0.047$ and $P = 0.0001$ respectively). Compared to HIV-negative TGs, HIV-infected TGs had more life-time SP ($P = 0.04$), but no difference in age of first exposure to RAI.

Anal warts were found in 31 subjects. The frequency of warts was significantly higher in females than in males and TGs ($P = 0.02$ for both comparisons) and in bisexuals than in TGs ($P = 0.03$) [Table 3]. Subjects with anal warts had fewer life-time SP, shorter duration and lower frequency of RAI and later age of first exposure to RAI compared to those without.

Furthermore, the frequency of warts was significantly higher in consistent users of condom in comparison to those who never used it (66.3% versus 17.6%, $P = 0.03$). Amongst subjects with warts, TGs had significantly lower age of first RAI exposure, higher frequency of RAI and more life-time SP compared to males and females. The frequency of HIV positivity in subjects with anal warts was lower than those without (35.5% versus 79.6%, $P < 0.0001$).

Conventional AC smears revealed SIL in 20 samples. Figure 1 shows representative images of Papanicolaou smears. Low-grade cytologic abnormalities were common: ASC-US (21.2%) followed by LSIL (3.5%). High-grade lesions (ASC-H and HSIL) were seen in one case each (both were HIV positive). No subject had invasive cancer. There was no difference between sexual

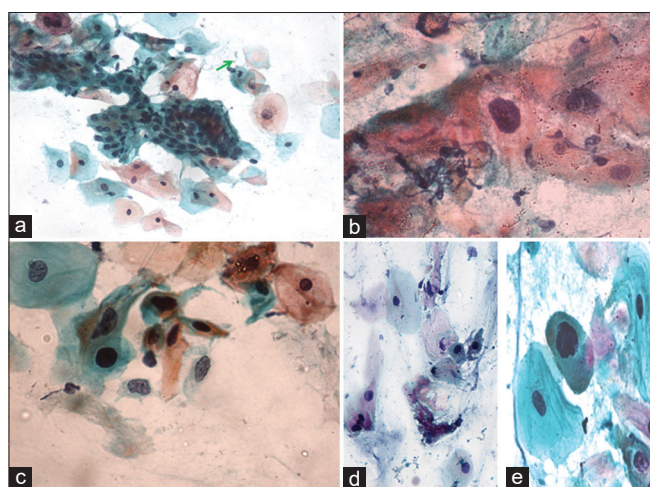


Figure 1: Representative images of Papanicolaou smears: (a) sheet of rectal columnar cells, superficial and intermediate squamous cells with eosinophilic and cyanophilic cytoplasm respectively in a case of NILM (40x) (b) ASCUS (100x), (c) LSIL (100x), (d) ASCH (40x) and (e) HSIL (100x)

practices, HIV status and CD4 cell counts with respect to presence/absence of SIL [Table 4]. TGs with SIL reported earlier first exposure to RAI compared to males with SIL ($P < 0.01$). Sixteen subjects with SIL were HIV infected; all were on ART. Amongst ART receiving subjects, those with SIL had significantly shorter mean treatment duration compared to negative cytology counterparts (1.3 years versus 2.7 years, $P < 0.01$). The odds of having SIL were four times higher for shorter ART (≤ 2 years) than longer duration (OR = 4.1, 95% confidence interval: 1.05-17.8, $P = 0.04$).

Forty-five subjects had clinical and/or cyto-morphologic evidence of HPV infection. The average duration of RAI was shorter in these subjects (10.1 years) compared to those without stigmata of HPV infection (15.7 years, $P < 0.0002$). The frequency of HIV positivity in the former group was also lower compared to latter (53.3% versus 75%, $P = 0.04$). Further, their duration of ART was shorter than those without evidence of HPV infection (group means: 1.4 years and 2.9 years respectively, $P = 0.003$). ART duration ≤ 2 years was associated with higher odds of HPV infection evidence than longer treatment duration (OR = 4.4, 95% confidence interval: 1.3-15.2, $P = 0.02$).

Discussion

Traditions accord men the role of bearers of family name by hetero-sexual conjugation. Social acceptance of MSM is variable across nations and cultures.^[7-9] In America, social marketing has played a major role in social acceptance of gay, lesbian, bisexual and transgender people. Compared to a decade earlier, 60% of Americans are more likely to accept gay relationships and marriages.^[20] In few American schools, transgender terminology has been introduced in an attempt to promote all-inclusive society.^[21] In India, unconventional sexual relations are abhorred and discriminated against. Recognition of TGs as third gender in 2011 national census fails to address the complex world of MSM

Table 1: Clinico-demographic profile of study population and its sub-groups

Parameter	Study population (n=85) (%)	TGs (n=29) (%)	Males (n=51) (%)	Females (n=5) (%)
Mean age (years)	31.3	32.1	31.1	29.4
Homosexual	49	29	20	0
Bisexual	31	0	31	0
Heterosexual	5	0	0	5
Life- time SP (mean)	8.1	11.5	6.8*	1.2*#
Mean duration of RAI (years)	12.7	15.5	12.0*	4.3*#
Mean RAI frequency (per month)	26.3	35.0	23.8*	0.8*#
Mean age at first RAI exposure (years)	17.8	16.0	18.2*	24.0*#
HIV infected	54 (63.5%)	22 (75.9%)	31 (60.8%)	1 (20%)*
Anal warts	31 (36.5%)	6 (20.7%)	20 (39.2%)	5 (100%)*#
Other STI	16 (18.9%)	4 (13.8%)	11 (21.6%)	1 (20%)
Condom: Never	17 (20%)	9 (31.1%)	8 (15.7%)	0*
Condom: Inconsistent	59 (69.4%)	17 (58.6%)	39 (76.5%)	3 (60%)
Condom: Consistent	9 (10.6%)	3 (10.3%)	4 (7.8%)	2 (40%)
Married	15 (17.6%)	0	12 (23.5%)	3 (60%)
Literate	54 (63.5%)	10 (34.5%)	39 (76.5%)*	5 (100%)*

* $P < 0.05$ with respect to TGs, # $P < 0.05$ with respect to males

Table 2: Clinico-demographic profile of study population stratified by HIV infection

Parameter	HIV sero-positive subjects (n=54) (%)	HIV sero-negative subjects (n=31) (%)	HIV sero-positive TGs (n=22) (%)	HIV sero-positive males (n=31) (%)	HIV sero-positive females (n=1) (%)
Mean age (years)	33.25	28.0	33.45	32.9	39
Homosexual	36	13	22	14	0
Bisexual	17	0	0	17	0
Heterosexual	1	0	0	0	1
Life- time SP (mean)	10.0	4.8 [§]	13.9	7.5*	1
Mean duration of RAI (years)	14.8	9.0 [§]	16.2	13.9	14
Mean frequency of RAI (per month)	26.9	25.2	31.6	24.5	0.08
Mean age at first RAI exposure (years)	17.5	18.5	16.0	18.4*	22
Anal warts	11 (20.4%)	20 (64.5%) [§]	3 (13.6%)	7 (22.6%)	1 (100%)
Other STI	9 (16.7%)	7 (22.5%)	3 (13.6%)	6 (9.4%)	0
Condom: Never	15 (27.8%)	2 (6.5%) [§]	8 (36.4%)	7 (22.6%)	0
Condom: Inconsistent	38 (70.4%)	21 (67.7%)	14 (63.6%)	23 (74.2%)	1 (100%)
Condom: Consistent	1 (1.8%)	8 (25.8%) [§]	0	1 (3.2%)	0
Mean ART duration (years)	2.2	NA	2.7	1.9	1
CD4 count (/mm ³) at diagnosis	387	NA	348.8	417.3	310
Nadir CD4 count (/mm ³)	339	NA	309.8	360.4	310
Married	4 (7.4%)	11 (35.5%)	0	4 (12.9%)	0
Literate	27 (50.0%)	27 (87.1%) [§]	8 (36.4%)	18 (58.1%)	1 (100%)

[§]P<0.05 with respect to HIV sero-positive subjects. *P<0.05 with respect to TGs

Table 3: Clinico-demographic profile of study population stratified by warts

Parameter	Subjects with anal warts (n=31)	Subjects without anal warts (n=54)	TGs with anal warts (n=6)	Males with anal warts (n=20)	Females with anal warts (n=5)
Mean age (years)	27.4	33.6	24	28	29.4
Homosexual	11	38	6	5	0
Bisexual	15	16	0	15	0
Heterosexual	5	0	0	0	5
Life- time SP (mean)	4.5	10.2 [§]	8	4.2	1.3*
Mean duration of RAI (years)	8.16	15.6 [§]	8.6	8.9	4.3
Mean frequency of RAI (per month)	19.6	30.2 [§]	37.5	19.5	0.05*
Mean age at first RAI exposure (years)	18.6	17.4 [§]	15.8	18.4*	24.4*#
HIV infected	11 (35.5%)	43 (79.6%) [§]	3 (50%)	7 (35%)	1 (20%)
ART duration ≤2 years	8	18	3	4	1
Mean duration of ART (years)	1.3	2.5	0.6	1.7	1
Other STI	5 (16.1%)	11 (20.4%)	2 (33.3%)	2 (10%)	1 (20%)
Condom: Never	3 (9.7%)	14 (25.9%)	1 (16.7%)	2 (10%)	0
Condom: Inconsistent	22 (70.9%)	37 (68.5%)	4 (66.7%)	15 (75%)	3 (60%)
Condom: Consistent	6 (19.4%)	3 (5.6%)	1 (16.7%)	3 (15%)	2 (40%)
Married	8 (25.8%)	7 (12.9%)	0	6 (30%)	2 (40%)
Literate	25 (80.6%)	29 (53.7%) [§]	3 (50%)	17 (85%)	5 (100%)

[§]P<0.05 with respect to subjects with anal warts. *P<0.05 with respect to TGs. #P<0.05 with respect to males

and their sexuality.^[22] MSM continue to remain marginalized, health compromised in general and especially at higher risk of HIV, HPV and other sexually transmitted infections (STI).^[5,6] Moreover, gender non-confirming individuals have low awareness for their unique health requirements including pre-exposure prophylaxis.^[4,23]

Health professionals are often the first people to whom TGs disclose their sexual orientation, even before their close friends and family.^[24] Fear of anticipated discrimination and unequal access to healthcare contribute to continued marginalization of gender non-confirming individuals.^[11-13] Being close to the community, primary care physicians are in a unique position to

alleviate the fear of discrimination, create safe and welcoming space to facilitate access and delivery of health services for gender non-confirming individuals.^[15] Sensitization to such issues is likely to promote all-inclusive healthcare.

We share findings of our cross-sectional study on individuals with history of RAI recruited from a tertiary care hospital in Delhi. TGs constituted approximately one-third of the study population. Overall, their sexual practices were significantly riskier than non-TG males, bisexual males and females. The mean and the median age of first RAI exposure in MSM were 17.5 and 18 years, respectively as compared to the median age of 17 years reported in national Integrated Biological and

Table 4: Clinico-demographic profile of study population stratified by SIL

Parameter	Subjects with SIL (n=20)	Subjects without SIL (n=65)	TGs with SIL (n=5)	Males with SIL (n=13)	Females with SIL (n=2)
Mean age (years)	31.0	31.5	31.0	30.8	32
Homosexual	13	36	5	8	0
Bisexual	5	26	0	5	0
Heterosexual	2	3	0	0	2
Life- time SP (mean)	10.4	7.4	16.2	9.7	1
Mean duration of RAI (years)	13.8	12.4	8.7	8.9	10.5
Mean frequency of RAI (per month)	24	27	37.5	19.2	0.05
Mean age at first RAI exposure (years)	17.1	18.1	15.8	18.1*	20
HIV infected	16 (80%)	38 (58.5%)	4 (80%)	11 (84.6%)	1 (50%)
ART duration ≤2 years	13	18	3	9	1
Mean ART duration (years)	1.3	2.7	1.1	1.4	1
Anal warts	6 (30%)	25 (38.5%)	1 (20%)	3 (23.1%)	2 (100%)
Other STI	2 (10%)	14 (21.5%)	0	2 (15.4%)	0
Condom: Never	6	11	2 (40%)	4 (30.7%)	0
Condom: Inconsistent	14	45	3 (60%)	9	2 (100%)
Condom: Consistent	0	9 (26.4%)	0	0	0
Married	1 (5%)	14 (21.5%)	0	1 (7.7%)	0
Literate	18 (90%)	36 (55.4%) [§]	3 (60%)	10 (76.9%)	1 (50%)

[§]P<0.05 with respect to subjects with SIL. *P<0.05 with respect to TGs

Behavioural Surveillance (IBBS) 2014-15.^[25] Childhood exposure to first RAI was common in MSM (37.5%) whereas TGs reported disproportionately (68.9%, youngest age was 11 years) compared to homosexual males (20%) and bisexual males (19.3%). Majority of TGs with childhood RAI (70%) experience were HIV infected. In one study, 18% college students in a north Indian cohort recalled childhood sexual abuse.^[26] Tomori *et al.*^[27] have also reported childhood sexual abuse including RAI in 22.4% of Indian MSM with higher frequency in kothis. Thoma *et al.*^[28] from United States too found TG adolescents to have experienced higher rates of sexual abuse compared to heterosexual cisgender counterparts. TGs face additional healthcare challenges compared to their lesbian, gay, bisexual and cisgender counterparts.^[11-13,29]

History of female sexual contact was elicited in 38.75% MSM. This frequency is on lower side of earlier Indian reports (44-48%).^[16,23,28] Godbole *et al.*^[30] found being bisexual to be associated with older age (>30 years: Adjusted odds ratio 6.5). The sexual practices of bisexual males were less risky compared to TGs; they had higher age of first RAI exposure and less chance of childhood RAI experience. This difference was preserved even in HIV-infected inter-group comparison. Godbole *et al.*^[30] noted slightly lower HIV positivity frequency in bisexual males (5.3%) compared to overall frequency in MSM (6.8%). However, the profile of bisexual males is not consoling as 54.8% of them were HIV positive; 35.5% were married and leading hetero-conjugal life. According to IBBS 2014-15 report, 68% of bisexual males had regular female SPs and only 45% of such people reported condom use with regular female SPs in the last 12 months.^[25] These figures reaffirm the significance of recognizing bisexual males as a separate sub-group because of forced hetero-conjugal life, remaining hidden and their position as a bridge population for spreading HIV and other STI to their regular female SPs.

Females had significantly lower frequency of HIV infection (20%) compared to TGs (75.9%, $P = 0.03$). They also had the lowest risk profile with fewer life-time SP (1-2) and none reporting 'never' condom use. All were literate compared to 34.5% TGs. As a result of a small number of females in the study group, further analysis was not possible. The IBBS 2014-15 study mentions one in five female sex workers reporting RAI in the last 1 month.^[25]

'Ever' condom use was reported by 79.8% MSM. This frequency is in line with a reported national average of >80% condom use during last RAI with their MSM partners.^[25] This demonstrates the impact of awareness and condom distribution by NACO outreach programmes.^[5,6] Condom use was reported as consistent and never by seven (8.8%) and 17 (21.3%) of MSM, respectively. In the former group only one subject (14.3%) was HIV positive compared to 15 (88.2%) in the latter, all of whom were on ART. It is difficult to comment if subjects in this study were adopting sero-sorting practices, meaning choosing partners with similar sero-status. The American National Behavioral Surveillance Study recorded significant increase in both concordant and discordant sero-status condom-less sex in American HIV-infected MSM from 2005 to 2014. There was a significant increase in condom-less sex and HIV-negative MSM having sex with known infected/unknown serology status individuals.^[31] As per a geo-socializing mobile application in Mumbai, disclosure of self-HIV status remains low, although the preference for condom-less sex/sex with condom is more widely stated within the MSM community.^[32] Understanding this aspect of condom-less sex is crucial to control spread of HIV in MSM.

Positive results for HIV were found in 67.5% study subjects. They had more life-time SPs and longer RAI duration. Consistent

condom use was significantly associated with HIV-negative status, as reported earlier.^[16] The overall frequency of HIV infection in MSM was 66.3% with comparable frequency in TGs, homosexual males and bisexual males. The HIV-infected TGs showed significantly higher risk profile than HIV-infected bisexuals and variable differences from HIV-infected homosexuals. Compared to HIV-negative TGs, HIV-infected TGs had higher number of life-time SPs. HIV-infected males had longer RAI duration than HIV-negative males. Positive association of HIV positivity with increasing number of SPs, other sexually transmitted infections, lack of/lower education and lack of consistent condom use has been documented.^[33-35]

HPV infection is the most common sexually transmitted infection; almost one-half of the world population is at risk of being infected at least once in lifetime.^[36] Warts are clinical correlates of low-risk HPV exposure and an indirect barometer of sexual activity. Anal warts were found in 32.5% MSM; the frequency in bisexual males was significantly higher than TGs. The higher risk profile of TGs was maintained within the wart-positive category with earlier age of first RAI emerging as a consistent observation. All females had anal warts. The association between frequency of genital warts and HIV status is often positive owing to similarities of their modes of transmission. HIV-infected subjects tend to have increased incidence of warts and lower HPV clearance rates compared to HIV-negative counterparts putting them at higher risk of SIL.^[37,38]

AC is a useful tool for detection and monitoring of anal dysplasia preceding invasive cancer, especially in a resource limited setting like India. SIL was detected in 23.75% MSM and 60% females. Women with anal dysplasia almost always have a history of RAI and are likely to have concomitant cervical HPV localization and dysplasia.^[39,40] High-grade cytology was found only in HIV-positive cases. Wu *et al.*^[41] have reported significantly higher frequency of abnormal cytology ($P < 0.001$) and HSIL in HIV-positive MSM compared to HIV-negative counterparts (23.8% versus 4.8%, $P = 0.009$). Such observations support the synergistic role of HIV in anal squamous oncogenesis and validate current guidelines of screening all HIV-positive RAI engaging individuals and MSM in particular at regular intervals.^[1-3,42,43]

More than one-half (45/85) of the study population had evidence of HPV infection. These subjects had shorter duration of RAI compared to those without stigmata of HPV infection. Other risk factors were also lesser in the former group compared to the latter, but the differences were statistically insignificant. This seemingly negative clinical association among warts, SIL and HPV infection with riskier sex practices was evaluated in light of HIV status. We found that subjects with anal warts and evidence of HPV infection were more likely to be HIV negative (64.5% and 46.7% respectively) than those without (20.4% and 25%, $P < 0.0001$ and $P = 0.04$ respectively). We are unable to comment on the underlying immunologic mechanisms for this observation. Transmission of HPV does not require penetrative sex; less common transmission

routes being skin to skin genital contact, oral transmission and self-inoculation.^[44]

ART suppresses viral replication and restores CD4 cell counts in HIV-positive cases. In view of the above findings, we tried to determine if there was any correlation between ART and presence of warts/SIL/evidence of HPV infection. The odds of having SIL and evidence of HPV infection were higher with ART duration of ≤ 2 years (OR: 4.1 and 4.4 respectively). Two cases had high grade cytology (ASC-H and HSIL), the duration of ART was 3 and 6 months, respectively. Longer duration of ART is said to be protective against high-grade SIL.^[42,45] These findings likely suggest the facilitative role of ART on immune reconstitution and delay in progression to high grade lesions. However, the immune reconstitution at genital tract mucosa following ART is not complete, as observed by presence of abnormal patterns of cytokine and chemokine production and skewing of immune cell populations.^[46] The incidence of anal SCC in ART era has actually increased from pre-ART era; contributed partly by longer life expectancy of treated people. This underscores the needs and benefits of cytologic monitoring in RAI-engaging individuals, especially HIV-positive individuals as early disease carries significantly less mortality and morbidity.^[1,47]

Conclusion

To summarize, we have presented our findings of sexual practices and AC in individuals with history of RAI. TGs were the most marginalized with significantly higher childhood RAI experience, highlighting the need to address childhood sexual abuse. Bisexuality was common and its implications as a bridge population are immense. ART > 2 years was protective against SIL, the precursor lesions of SCC of the anal canal. The major limitations of our study are relatively small size, hospital-based subject recruitment with its associated bias and lack of histopathologic correlation. To conclude, our results highlight the most disadvantaged position of TGs within the RAI practicing-individuals and urge for addressing their comprehensive healthcare needs.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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