Original Article

Assessment of Behavioral Risk Factors in Emerging Anogenital Viral Sexually Transmitted Infections: An Observational Cross-sectional Study in Eastern India

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Abstract

Background: High-risk sexual behaviors like multiple sexual partners, unprotected sexual intercourse, early coital debut, increase in oral sex, and anal coitus are associated with an increasing trend of viral sexually transmitted infections (STIs) worldwide. So, we conducted this study to determine the present scenario of sexual practice and the emerging trend of viral STIs in the Indian population. **Materials and Methods:** An institution-based observational cross-sectional study was conducted among patients with anogenital viral STIs after taking informed consent. A detailed history was taken regarding patients' particulars, sexual practice and addiction profile. Data were analyzed by Med-Calc statistical software version 12.5.0.0. **Result and Analysis:** Two hundred and thirty-four eligible consenting patients with anogenital viral STIs were included in the study. Most common age group were 25–44 years (54.70%, $n = 128$); male:female = 188:46. Majority of the population were factory workers (33.33%, $n = 78$), truckers (13.67%, $n = 32$), and commercial sex workers (4.27%). History of migration was present in 73.50% ($n = 172$). The mean age of coital debut was lower in females ($P < 0.0001$). Approximately 86.3% ($n = 202$) of patients were heterosexual. The mean number of nonspouse heterosexual partners was 15.81 ± 20.76. Partners of homosexual individuals ($n = 32$) were mostly co-worker ($n = 22$) or co-student ($n = 10$) and only four patients used condom regularly. About 56.4% ($n = 132$) patients had adequate knowledge of condom benefit though only 33.33% ($n = 44$) used it consistently. History of alcohol consumption during sexual exposure was present in 31.62% ($n = 74$) of people. Among them, adequate knowledge of condom benefit was present in 54 people but only 12 of them used it consistently ($P = 0.028$). **Conclusion:** Promotion and provision of sex education, awareness programs, and strategies to reduce high-risk behavior should be conducted among the population.

Keywords: Alcohol, anogenital viral STIs, condom, high risk, sexual behavior

Introduction

Sexually transmitted infections (STIs) are infections that are transmitted by sexual intercourse including clinically asymptomatic cases. All viral STIs are highly contagious and may remain asymptomatic as a potential source of infection. They are either incurable or very poorly responding to available pharmacological intervention and associated with complications of variable severity, producing significant morbidity.

Sexual behavior is how one expresses and experiences his sexuality. It can be described in terms of number of partners, mode and frequency of sexual exposure, protective measures, or "safe sex practices." All the factors lead to identify a person's sexual behavior as of high or low risk in respect to the chance of acquiring different STIs. Multiple sexual partners, unprotected sexual intercourse, increase in oral sex, and anal coitus were associated with a

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high incidence of viral STIs. So, detailed sexual behavior of affected individuals and their association with viral STIs are necessary to understand the present trend as well as planning the disease control strategies. This study was conducted to find out the association of sexual behavior patterns among patients with viral STIs.

Materials and Methods

An institution-based observational cross-sectional study was conducted in the STI clinic of a tertiary care hospital for a period of 12 months. Ethical clearance was taken. Patients with anogenital viral STI were included in the study after taking informed consent. Patients having STI other than the viral origin, having genital stigmata of viral infections without any history of sexual exposure, and unwilling patients were excluded from the study.

Diagnosis of viral STIs was made with detailed history and clinical examinations. However, in doubtful cases, appropriate investigations were performed. Detailed history, including patients' particulars, history of sexual exposure, especially about high-risk behavior, use of alcohol or drugs, and condom at the time of exposure were recorded. All the data were analyzed to find out the association of sexual behavior patterns among those patients with viral STIs.

The continuous data were analyzed by using an unpaired *t*-test (parametric test) or Mann–Whitney *U* test (nonparametric test) and categorical data were analyzed by using the χ^2 test. Microsoft Excel was used for drawing the graph. Med-Calc statistical software version 12.5.0.0 was used for categorical statistical analysis and *P* value ≤ 0.05 was considered statistically significant.

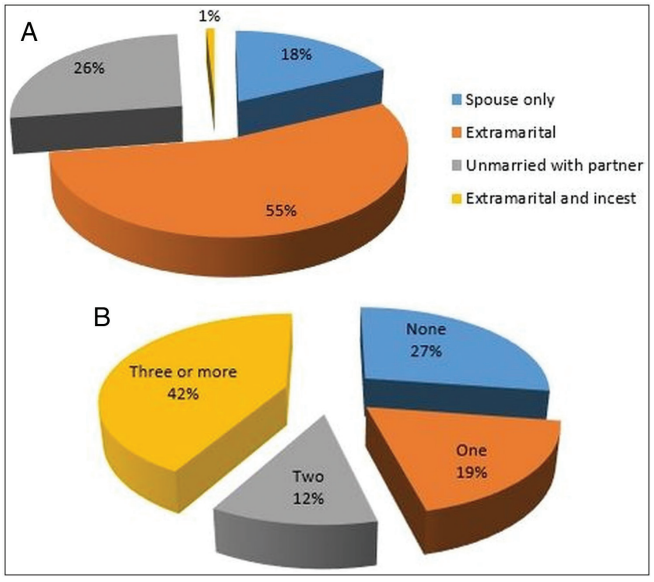

Figure 1: (a): Sexual engagement profile of the population in the study. (b): Frequency of numbers of heterosexual partners (nonspouse) of the population in the study

Result and Analysis

During the study period, 1324 patients attended the STI clinic of which 234 patients were included in the study. The prevalence of viral STIs with anogenital manifestations was 17.67% (*n* = 234). Among them anogenital wart was the majority (*n* = 116, 8.76%) followed by ano-genital herpes (*n* = 100, 7.55%) and molluscum contagiosum (MC) (*n* = 24, 1.80%). Six patients (0.45%) had concomitant warts and MC.

Most common age group involved were 25–44 years comprising 54.70% (*n* = 128); followed by ≥45 years 27.35% (*n* = 64); 18–24 years 14.53% (*n* = 34); and <18 years was 3.42% (*n* = 8). Male:female ratio was 188:46. Majority of the population in this study were factory workers (33.33%, *n* = 78), truck drivers (13.67%, *n* = 32), and commercial sex workers (CSW) (4.27%, *n* = 10) among the high-risk group and others like house wives (11.11%, *n* = 26), students (6.83%, *n* = 16), skilled workers (20.51%, *n* = 48), and small businessmen (10.25%, *n* = 24).

In our study 21.37% people were illiterate (*n* = 50). Among literates, 36.49% (*n* = 62) of people had education up to primary standard, 35.90% (*n* = 84) had higher secondary standard, 12.82% (*n* = 30) were graduate, and rest 3.41% (*n* = 8) people had postgraduate qualification. Approximately 23.90% (*n* = 56) were below poverty line. History of migration were present in 73.50% (*n* = 172). In study population, 63.2% (*n* = 148) were married followed by unmarried 26.5% (*n* = 62) and 10.3% (*n* = 24) were either divorced, widow, or widower. Figure 1a is showing sexual engagement profile. Among the study population, 86.3% patients were heterosexual (*n* = 202); while homo- and bisexual shared 6.8% each (*n* = 16).

The mean age of coital debut was 23.84 years (25.25 years in males and 18.04 years in females). It was significantly younger in females (<18 years in 22 [73.33%]) when compared with men (<18 years in 8 [26.67%] *P* < 0.0001).

The mean number of nonspouse heterosexual partners of the patients was 15.81 ± 20.76; ranging from 1 to 25. The median number of partners in the molluscum group was quite high as 13.5. But post hoc analysis failed to detect any significant difference between these groups [Table 1]. The frequency of numbers of heterosexual partners (nonspouse) of the population in the study was shown in Figure 1b. Most of the heterosexual nonspouse partners were CSWs, comprising 80% (*n* = 136).

The route of sexual exposure of the population in the study was shown in Figure 2. The high incidence (81.25%, *n* = 26) of anogenital wart was found among 32 men sex with men (MSM) patients. Among them, 16 patients were homosexual male (4 [25%] patients were insertive, 10 [62.5%] were receptive, and rest 2 [12.5%] was of both forms *double-decker*) and the rest 16 patients were bisexuals male (10 [62.5%] were heterosexual and insertive-homosexual; 4

Table 1: Number of heterosexual partners (nonspouse) of the population in the study

Parameters	Herpes (n = 80)	Wart (n = 68)	Molluscum contagiosum (n = 16)	Molluscum contagiosum + wart (n = 6)	Total (n = 170)	P value (By Kruskal–Wallis test)
Mean ± SD	14.32 ± 20.51	15.73 ± 21.93	12.62 ± 9.24	45 ± 17.32	15.81 ± 20.76	0.100
Median	3	3	13.5	55	3	
IQR	1–25	1–35	3.5–20	32.5–55	1–25	

Note: Test for significance of difference was done by Kruskal–Wallis test as the data rejected normality. SD = standard deviation; IQR = interquartile range

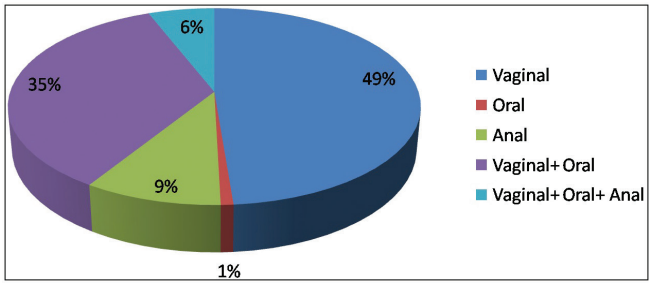

Figure 2: Route of sexual exposure of the population in the study

were heterosexual and receptive-homosexual; and the rest 2 were heterosexual as well as both form homosexual). Partners of homosexual individuals were mostly (n = 22) co-workers in the industry (jute mill/ factory workers) or co-student (n = 10). Out of 32 MSM, 43.75% (n = 14) patient did not use condom; 12.5% (n = 4) used it regularly, and rest 43.75% (n = 14) intermittently. Out of 32 MSM, adequate knowledge of condom use was present in 18 patients though only four patients used condoms regularly.

Details of knowledge of condom benefit versus history of condom use were shown in Table 2. The inter-rater kappa (k) was less than 0.02 with a confidence limit of 0.08–0.32 which indicated that there was very poor agreement between "knowledge of condom benefit" and "history of condom use." The habit of alcohol intake among the population in the study was 38.46% (n = 90). Out of them, 74 persons gave a history of alcohol consumption during sexual exposure either regularly or occasionally. Among these 74 persons, adequate knowledge of condom benefit was present in 54 persons and only 12 of them used condoms consistently in spite of having adequate knowledge (P = 0.028).

Discussion

STIs are dynamic and show variable prevalence. Viral STIs are on an upswing in India like other developed countries.

In our study, 54.70% (n = 128) patients were in the age group of 25–44 years which is in concordance with the study done by Sarkar *et al.*,[1] Vora *et al.*,[2] and Thapar *et al.*[3]

The sex distribution of our study showed a higher male predominance like Sarkar *et al.*[1] and Choudhry *et al.*[4] The attendance of female patients was less, which might be due to social and cultural restrictions, the asymptomatic nature of the disease in females, and the fact that female patients prefer to attend the gynecology department for the treatment of such problems. Though Thapar *et al.*[3] showed a higher female to male ratio (1.24:1) due to more antenatal care referrals.

Nyati *et al.*[5] demonstrated majority of patients (43%) in their study were educated up to the level of middle school while 11% were illiterate. In our study population, 21.37% (n = 50) people were illiterate.

The marital status in our study was 63.2%. These rates were 77.20% in Vora *et al.*[2] study, 46.30% in Saikia *et al.*[6] the study, 50% in Jain *et al.*[7] study, and 70.30% in Nyati *et al.*[5] study.

Maheswari *et al.*[8] found that the age of coital debut for females (n = 54, 78.3%) was significantly lower than males (n = 15, 21.7%) in the adolescence age group (<18 years). Our study also corroborated with the same finding.

In the present study, 54.7% (n = 128) had extramarital sexual exposure, quite high in comparison with 25% in Jain *et al.*[7] study.

In our study 86.3% (n = 202) patients were heterosexual; comparing 97% heterosexual in Vora *et al.*[2] study and 95.6% in Narayanan's study.[9] The incidence of homosexual contact was 3.5% and 1.6% in the study of Jain *et al.*[7] and Nyati *et al.*,[5] respectively.

The number of sexual partners is one of the most important risk factors of STIs. Choudhry *et al.*[4] showed 31.3% of patients (all males) had more than three sexual partners in the past six months whereas Mercer *et al.*[10] found that 48.1% of sexually active males and 39.5% of females aged 16–44 years had multiple sexual partners in the five years. We observed more than three heterosexual partners found in 41.90% of cases (n = 98).

The present study revealed most of the heterosexual nonspouse partners; 80% (n = 68) were CSWs, comparing 76.4% in Choudhry *et al.*[4] study. Nyati *et al.*[5] showed 23.50% of males had CSWs as sexual partners. This was particularly important in the background where most of the patients in our study (54.7%) had extramarital (n = 128) sexual exposure and most of their spouses were

Table 2: Knowledge of condom benefit versus history of condom use

	History of condom use			
Knowledge of condom use	Never	Every time	Intermittent	Total
Absent	28	0	2	30 (12.8%)
Adequate	40	44	48	132 (56.4%)
Inadequate	46	0	26	72 (30.8%)
Total	114 (48.7%)	44 (18.8%)	76 (32.5%)	234

housewives 65.10% (n = 112); making a perfect alignment between a "core group," a "bridging population" and an unaware victim.

Leichliter *et al.*[11] found one-third of men and women had ever had anal sex, and three-quarters had ever had oral sex, in a study among adults in the United States. Avasthi *et al.*[12] found the incidence of peno-vaginal, oral, and anal sex of 95%, 10%, and 1%, respectively among the female population in North-Eastern India. In present study, 48.7% (n = 114) patients had vaginal intercourse followed by 35% (n = 82) had both vaginal and oral sex.

Indian MSM concepts of sexual identity can be varied. Partners of homosexual individuals were mostly (n = 22) co-worker or co-student (n = 10). Approximately 43.75% (n = 14) of 32 MSM patients did not use condom. Vasilenko *et al.*[13] showed no use of condoms in 10%, intermittent use in 53%, and regular use in 38% of patients. We found in spite of having adequate knowledge of condom use (n = 18), only four patients use condoms regularly. This low incidence was mostly due to low purchasing power and lack of knowledge of free availability.

Condom use is considered to be the most effective measure of reducing the risk of STIs among sexually active persons. Our study demonstrated that 66.66% (n = 88) patients with adequate knowledge of condom benefit either never used condom (n = 40; 30.3%) or used it inconsistently (n = 48; 36.36%). This outcome may be linked to patients' opinions in favor of not using a condom during sexual intercourse, such as decreased pleasure or apparent symptomatic appearance of the partners. A few CSWs adopted this behavior for the higher pay by the clients. Maheswari *et al.*[8] found that the overall usage of condoms in the past six months was reported by 23.5% (n = 80) but none of them used it consistently. Majra *et al.*[14] found that only 4.4% of the participants were aware that condoms should be used consistently irrespective of the route of sexual intercourse though none of them reported being practicing it.

Studies on alcohol use have drawn greater attention due to its hypothesized association with STIs. The STI prevalence is found to be higher among alcoholics than their counterparts irrespective of their sociodemographic status in some studies. In India, a survey of female sex workers (FSWs) and their clients conducted in 2006 by the National AIDS Control Organization (NACO) revealed that about 46% of the FSWs and 78% of the clients ever consumed alcohol. Of these, 11% of FSWs and 17% of clients consumed alcohol regularly before sex.[15] Couture [16] found that among male clients of FSWs, 47.0% reported unhealthy alcohol consumption while 60.0% had recent heavy episodic drinking. In our study, the habit of alcohol intake was 38.46% (n = 90). Out of them, 31.62% (n = 74) persons gave a history of alcohol consumption during sexual exposure either regularly or occasionally. Only 12 persons (out of 54) use condoms consistently (P = 0.028) in spite of having adequate knowledge. This may be due to the influence of alcohol which creates a state of higher confidence and lower inhibition to engage in such risky activities.

Conclusion

Sexual behavior pattern is very important not only to understand the rising trend of viral STIs but also for the planning of disease control programs. These can be achieved by promoting strategies to reduce high-risk behavior, strengthening STI clinics, and family health awareness programs especially among females. Targeted intervention should be taken among the high-risk group like CSWs in the form of providing knowledge regarding safe sex practices and sensitizing them to stick to the guidelines in spite of higher offerings from their clients. Promotion and provision of easy availability of condoms among factory workers, truckers, and other high-risk groups should be ensured by involving factory owners, non-governmental organizations, and Out Reach Workers. Sex education and awareness programs should be conducted among the masses and vulnerable population regarding higher chance of acquiring STIs due to risky behavior under the influence of alcohol. Our study opens up scientific windows regarding future research works in a larger population.

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Conflicts of interest
There are no conflicts of interest.

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