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Spousal sexual violence and poverty are risk factors for sexually transmitted infections in women: a longitudinal study of women in Goa, India

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ABSTRACT

Objectives: To describe factors associated with incident sexually transmitted infections (STI) in a population-based sample of women in Goa, India.

Methods: A random sample of women aged 18–45 years was enrolled in Goa from November 2001 to May 2003. All subjects who consented to participate and completed the recruitment procedure were interviewed six and 12 months after recruitment. Incident chlamydia, gonorrhoea or trichomoniasis from vaginal and/or urine specimens were detected using a commercial polymerase chain reaction and the InPouch TV Culture Kit.

Results: Of the 2180 women followed up, 64 had an incident STI (incidence of 1.8% in the first six months, and 1.4% in the second six months). Incident STI was associated with low socioeconomic status, marital status, and with concurrent bacterial vaginosis. Incidence was highest among women who were married and exposed to sexual violence (10.9%), were concerned about their husbands' affairs (10.5%), or were separated, divorced or widowed women (11.0%).

Conclusions: Socially disadvantaged women are at increased risk of STI in this population. Sexual intercourse outside marriage was rarely reported in this population, and women are at risk of becoming infected within marriage, especially those with sexual violence. This highlights the vulnerabilities of socially disadvantaged married women in India, and the need for healthcare professionals to screen STI patients for violence, and provide the necessary support. The results also stress the importance of effectively diagnosing and treating married men with STI and promoting safer sex within marriage.

Almost half of all sexually transmitted infection (STI) cases occur in south and southeast Asia,¹ but there is no comprehensive STI surveillance system in India, and no population-based cohort studies of factors associated with incident STI in south Asia.

A recent World Health Organisation 10-country study² highlighted associations between violence and women's sexual and reproductive health, including STI risk behaviour, but did not include biological data. Other studies have found an association of intimate partner violence and STI in women,^{3–7} but there has been only one previous longitudinal study of sexual violence with incident STI among pregnant women,⁸ which found a twofold increased odds of incident STI with a history of sexual abuse.

Baseline data from our population-based cohort of women from Goa, India, found that disadvantaged women were likely to be infected by their husbands.⁹ A cross-sectional design, however,

cannot inform on the temporal association between variables, or causal direction. In this paper we present the results of longitudinal analyses, describing risk factors for incident STI.

METHODS

Participants

Details of the study population have been published previously.¹⁰ Briefly, 3000 non-pregnant women aged 18–45 years were randomly selected from the population registers of the Aldona Primary Health Centre in north Goa, maintained by the health department. Recruitment took place from November 2001 to May 2003. All subjects who consented to participate and completed the recruitment procedure were reviewed six and 12 months post-recruitment.

Data collection

At recruitment, we used a semistructured interview in English and local languages, with items derived from previous studies in Goa,^{11–13} organised into domains as follows:

- ▶ Socioeconomic risk factors: These included age, education, religion, marital status, and economic status assessed through housing type, access to water and a toilet, household income, employment status, difficulty managing financially, and the experience of hunger in the previous three months.
- ▶ Marital and gender disadvantage factors: These included lifetime experience of verbal, physical and sexual violence by the spouse and concerns about substance use including alcohol and about husband's extramarital relationships in the past year. Sexual violence was defined as the husband or partner forcing sex against the woman's wishes.
- ▶ Reproductive and sexual health risk factors: We asked all participants about current gynaecological complaints, contraceptive use, numbers of pregnancies, and pregnancies in the past year.

Biological outcomes

At each visit, we collected two high vaginal (for polymerase chain reaction; PCR) and two vaginal swabs (for smears and culture) from participants who consented to a gynaecological examination. For others, including unmarried participants, first-void urine specimens were collected in lieu of the high vaginal swabs, and self-administered vaginal swabs for smears and culture. Previous studies have shown that both methods are suitable substrates for PCR¹⁴ although vaginal swabs have slightly

higher sensitivity.¹⁵ The use of self-administered swabs for candidiasis and bacterial vaginosis have been shown to be a reliable method for the collection of vaginal material in Goa.¹⁶

Details of specimen collection and processing have been published previously.⁹ Briefly, reproductive tract infections were diagnosed in a locally established laboratory, which was designed specifically for PCR work. Chlamydial and gonococcal infections were detected using a commercial PCR method using the Roche Amplicor system (Roche Molecular Systems, Alameda, California, USA) and *Trichomonas vaginalis* infection using the InPouch TV Culture Kit (Biomed Diagnostic, San Jose, California, USA). Gram-stained slides were used for the detection of bacterial vaginosis and candidiasis, using the Nugent's score system,¹⁷ and numbers of yeast cells seen per high power field, respectively.¹⁸ Positive *Neisseria gonorrhoea* and *Chlamydia trachomatis* results were confirmed by repeating the test, first with a duplicate of the original specimen and, if this was equivocal, with a back-up specimen. Quality control for the laboratory tests consisted of independent verification of 10% of slides (for bacterial vaginosis and candidiasis) by an independent microbiologist or one of the authors (BW). In addition, the laboratory participated in an external quality control programme for PCR (UK NEQAS).

Outcome measures

The primary outcome was the presence of an incident STI (*N. gonorrhoea*/*C. trachomatis*/*T. vaginalis*) at either of the six or 12-month reviews, i.e. an incident infection since the previous round.

Analysis

Two data records were created for each woman, corresponding to the time periods T0 (baseline to 6 months) and T1 (6–12 months). Records consisted of baseline sociodemographic and gender risk factors, and the presence of reproductive tract infections at start of the analysis period. For each STI, the number of incident infections was calculated for each of the two time periods, and risks of incident STI were calculated in T0 and T1, respectively.

Odds ratios (OR) and 95% confidence intervals (CI) were estimated with logistic regression. Statistical significance was assessed with the likelihood ratio test. *p* Values for trend were estimated when the odds ratios indicated a log-linear trend by fitting the factor as a linear term and assessing significance with the likelihood ratio test. No adjustment for multiple infections per woman was made because only one woman contributed more than one incident case of STI. First, a multivariate model for the association of an incident STI with socioeconomic-demographic factors was built by including those factors with $p \leq 0.1$ or a strong association ($OR \geq 2$ or ≤ 0.5) in univariate analyses, and then retaining only those whose *p* values remained at $p \leq 0.1$, or with adjusted $OR \geq 2$ or ≤ 0.5 . Next, the associations of incident STI with each factor in the other domains specified above (except bacterial vaginosis and candidiasis) were assessed, adjusting for the socioeconomic-demographic factors identified in the multivariable model. The final model was formed by adding all factors with an adjusted $p \leq 0.1$ or $OR \geq 2$ to the multivariable model, and retaining those whose *p* values remained at $p \leq 0.1$ or $OR \geq 2$, together with concurrent bacterial vaginosis and candidiasis if these were significant.

The population attributable fraction for the association of sexual violence and/or concern with incident STI was calculated from the final multivariable logistic regression model using the

formula $p(\theta - 1/\theta)$, where *p* is the proportion of the cases who were exposed, and θ is the adjusted odds ratio.

RESULTS

Of the 3000 randomly selected women, 2494 consented to participate (83.1%). Details of the recruited sample and follow-up have been published.^{9 10 19} Briefly, the most common reason for refusal was that the woman did not have time to participate (52%) or that a family member had not given permission for her to participate (19%).

STI incidence

Of 2494 women at baseline, 101 (4.0%) had an STI and data were missing for 80 women (3.2%; fig 1). Of the 2393 without a known STI at baseline, 2054 women (86%) were seen at six months, and 37 (1.8%, 95% CI 1.3 to 2.5%) had an incident STI (13 *C. trachomatis*, 14 *N. gonorrhoea*, nine *T. vaginalis*, and one had both *N. gonorrhoea* and *C. trachomatis* detected). At the 12-month visit, 1991 women (80%) were seen, of whom 1950 did not have an STI at the six-month visit and were eligible for analysis. Of these, 28 (1.4%, 95% CI 1.0 to 2.1%) had an incident STI (nine *C. trachomatis*, eight *N. gonorrhoea*, 10 *T. vaginalis*, one with dual *N. gonorrhoea*/*C. trachomatis*). One woman had incident *N. gonorrhoea* in T0 and incident *C. trachomatis* in T1. A total of 64 women thus had an incident STI over the whole follow-up period out of the 2180 women who contributed to at least one time period of analysis (cumulative incidence of 64/2180, 2.9%).

On univariate analyses, incident STI was associated with age above 25 years, being divorced/widowed/separated, and lower socioeconomic status (less education, lower literacy, being a migrant, lower income, lack of toilet in home, lack of tapwater and hunger in past three months; table 1).

In multivariate analyses, being married (OR 4.6, 95% CI 1.6 to 12.8) or previously married (OR 12.1, 95% CI 3.4 to 42.7), being a migrant (OR 2.4, 95% CI 1.3 to 4.5), and markers of lower socioeconomic status (no toilet at home (OR 2.0, 95% CI 1.0 to 3.8), no tapwater at home (OR 2.2, 95% CI 1.2 to 4.0), larger household size (OR 2.1, 95% CI 0.9 to 5.6), and difficulty managing financially (OR 1.6, 95% CI 0.9 to 2.6) were independently associated with incident STI.

Separate multivariate models were fitted for each behavioural factor, adjusted for these socioeconomic factors. Few married women reported having an extramarital sexual partner within the past 12 months (eight out of 1552, 0.5%), and few non-married women reported a sexual partner within the past 12 months (nine out of 628, 1.4%). No woman reporting extramarital sexual intercourse was diagnosed with an incident STI during follow-up, so this factor was not included in the analysis.

Incident STI was associated with reported spousal sexual abuse (OR 3.0, 95% CI 1.2 to 7.5) and concerns regarding the spouse's extramarital sexual relationships (OR 3.0, 95% CI 0.7 to 13.4; table 2). There was little association with verbal or physical spousal abuse, or with reproductive health factors (table 3). Current infection with bacterial vaginosis was, however, significantly associated with incident STI (OR 2.7, 95% CI 1.6 to 4.6).

In the final multivariate analysis, variables reflecting lower socioeconomic status (no tapwater or toilet in the house, being a migrant, larger household size) remained independently associated with incident STI (table 4). Women who had ever been married were at increased risk compared with single women. Among married women, the risk of incident STI was

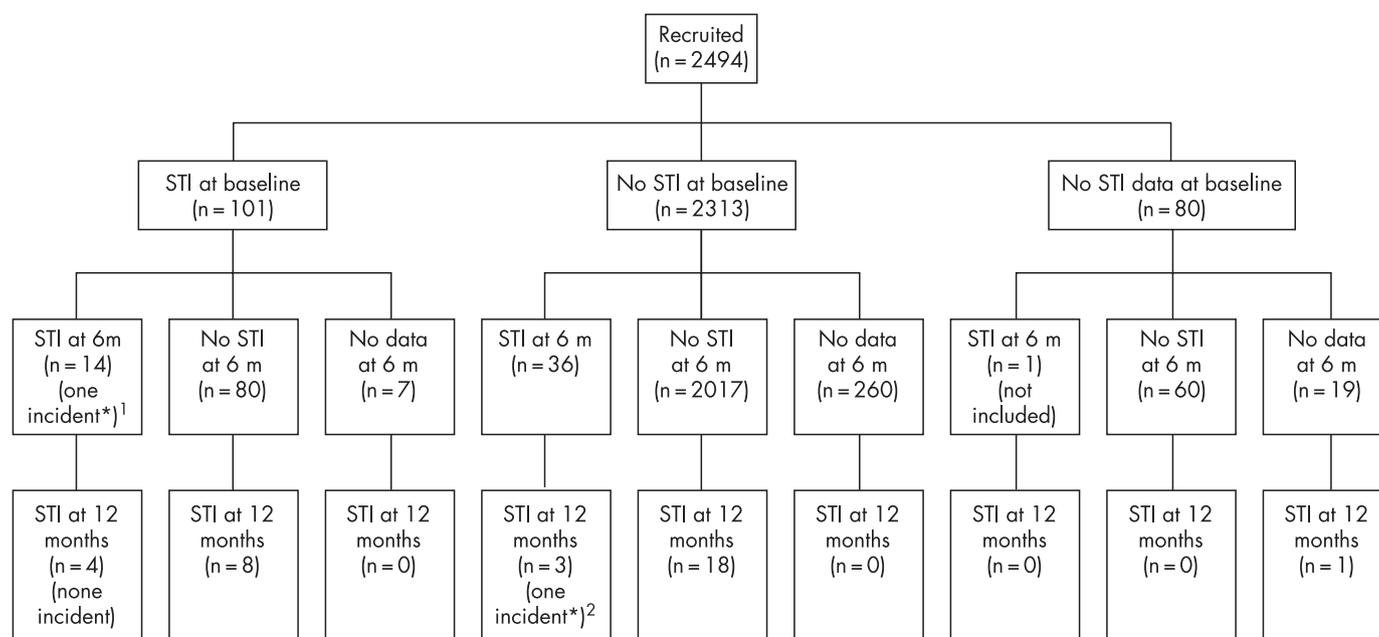


Figure 1 Flowchart of sexually transmitted infection (STI) status at baseline, six and 12-month follow-up visits.*One participant had *T vaginalis* at baseline and *C trachomatis* at the six-month (6 m) follow-up, so is included as an incident infection at 6 months. †One participant had *N gonorrhoea* at the six-month follow-up and *C trachomatis* at the 12-month follow-up, so is included as an incident infection at 12 months

highest among those who reported spousal sexual violence and/or concern about husband's extramarital affairs. Concurrent bacterial vaginosis remained significantly associated with incident STI after adjusting for other factors.

As a result of the relatively rare prevalence of sexual violence or concern about a husband's affairs among cases (11%), the population attributable fraction associated with an incident STI was 10% for being married with sexual violence and/or concern about husband's affairs, 54% for being married without sexual violence or concern, and 11% for being separated, divorced or widowed.

DISCUSSION

This longitudinal study demonstrates that being married, and poverty, are associated with incident STI among women in India. Married women reporting spousal sexual violence were at high risk, as were separated, divorced or widowed women, who tended to be of lower socioeconomic status.

Sexual behaviour outside marriage was rarely reported in this population, and the lower risk among single women probably reflects the low level of sexual activity in this population occurs before marriage.²⁰ Our findings support previous cross-sectional results in this population that women were likely to be infected by their husbands,⁹ and confirm previous cross-sectional studies in south east Asia, including a study of HIV infection among married monogamous women in India, which found that the majority were infected by their husband,^{21–23} one from Uttar Pradesh,³ which found that men who sexually abused their wives were significantly more likely to have STI symptoms than men reporting no abuse, suggesting that these men may be placing their wives at risk of STI acquisition, and a recent study from Bangladesh,⁴ which found that spousal violence was the most important contributing factor for reproductive health problems in women.

Globally, there are few epidemiological studies of intimate partner violence and STI, and these have found an association.^{3–8} All but one,⁸ however, have been cross-sectional studies, and

most did not distinguish between physical and sexual violence. The only previous study that tested for incident STI infection was a retrospective cohort study among prenatal clinic attenders in Minnesota, USA.⁸ Incident STI during pregnancy were significantly associated with a history of sexual abuse (OR 2.14, CI 1.1 to 4.0), after adjustment for age, ethnicity and marital status. As in the current study, there was also some evidence of an increased risk among those more socially vulnerable in this population (i.e. young age, black ethnicity, and being unmarried).

Our study adds to the current literature in several ways. First, the longitudinal design enabled temporal analysis of factors associated with incident STI. Second, we used gold standard diagnostic tests rather than self-reported symptoms, which are poor predictors of STI, especially in south Asia.²⁴ Third, we achieved high participation rates in a population-based study, enabling generalisability. Finally, by using questionnaires with standardised and locally validated measures of risk factors and symptoms, we demonstrated that sexual violence, not physical violence, was most associated with STI.

The longitudinal design of our study enabled us to identify spousal sexual violence as a likely causal risk factor for STI in this population. Although the majority of married women with an STI did not report sexual violence or concern about a husband's affairs, those who did were at highest risk of incident cases of STI. Sexual violence may increase the risk of STI either through forced sex with an infected partner, or by limiting her ability to negotiate safe sexual behaviour.^{25–27} This increased risk of STI may also increase the risk of HIV infection.²⁸ A review found an association of forced/coercive sex and HIV infection,²⁵ but as all the studies were cross-sectional it was not possible to determine a direct temporal relationship.

Several variables indicating lower socioeconomic status (lack of toilet/tapwater in the house; larger household size; non-Goan ethnicity; being widowed) were independently associated with incident STI. To our knowledge, there is no link between poor hygiene and these STI in women, although poor penile hygiene

Table 1 Association of sociodemographic characteristics with incident sexually transmitted infection

	N	n (%)	OR (95% CI)	p Value
Age group (years)				
18–24	425	4 (0.9)	1	0.03
25–29	377	11 (2.9)	3.5 (1.1 to 10.8)	
30–34	449	19 (4.2)	4.6 (1.6 to 13.7)	
35–39	426	13 (3.1)	3.3 (1.1 to 10.0)	
40–49	503	17 (3.4)	3.7 (1.2 to 10.9)	
Marital status				
Married	1552	52 (3.4)	1	<0.001
Single	555	4 (0.7)	0.2 (0.1 to 0.6)	
Divorced/widowed/separated	73	8 (11.0)	3.6 (1.7 to 7.6)	
Education				
None	214	11 (5.1)	1	p Value for trend 0.002
1–9 years	867	30 (3.5)	0.7 (0.3 to 1.3)	
10–14 years	867	22 (2.5)	0.5 (0.2 to 1.0)	
15–23 years	232	1 (0.4)	0.1 (0.0 to 0.6)	
Literate				
Yes	1873	47 (2.5)	1	0.007
No	307	17 (5.5)	2.3 (1.3 to 4.0)	
Ethnicity				
Goan	1980	50 (2.5)	1	0.002
Non-Goan	200	14 (7.0)	2.9 (1.6 to 5.3)	
Religion				
Hindu	1648	48 (2.9)	1	0.78
Christian	466	13 (2.8)	1.0 (0.5 to 1.8)	
Muslim	66	3 (4.6)	1.5 (0.5 to 5.0)	
Occupation				
Homemaker	1461	43 (2.9)	1	0.92
Employed	451	14 (3.1)	1.1 (0.6 to 1.9)	
Other	268	7 (2.6)	0.9 (0.4 to 1.9)	
Income				
<2000	752	25 (3.3)	1	p Value for trend 0.07
2000–2999	377	15 (4.0)	1.1 (0.6 to 2.2)	
3000–4999	537	15 (2.8)	0.8 (0.4 to 1.5)	
5000–9999	353	5 (1.4)	0.4 (0.1 to 1.0)	
>10 000	159	4 (2.5)	0.7 (0.2 to 2.0)	
Type of housing				
Own home	1960	55 (2.8)	1	0.30
Rented	220	9 (4.1)	1.5 (0.7 to 3.0)	
Household size				
1–3	348	15 (4.3)	1	0.008
4–5	1186	25 (2.1)	0.5 (0.3 to 0.9)	
6–9	570	17 (3.0)	0.7 (0.4 to 1.5)	
10–17	76	7 (9.2)	2.2 (0.9 to 5.5)	
Number of bedrooms				
1	937	29 (3.1)	1	0.33
2	862	20 (2.3)	0.8 (0.4 to 1.4)	
3	381	15 (3.9)	1.3 (0.7 to 2.4)	
Toilet in home				
In house	885	13 (1.5)	1	<0.001
Outside house	1295	51 (3.9)	2.8 (1.5 to 5.2)	
Tapwater in house				
Yes	974	16 (1.6)	1	0.001
No	1206	48 (4.0)	2.5 (1.4 to 4.5)	
Difficulty managing financially				
No	1483	33 (2.2)	1	0.003
Yes	697	31 (4.5)	2.1 (1.3 to 3.5)	
Hunger in past 3 months				
No	2067	56 (2.7)	1	0.02
Yes	113	8 (7.1)	2.7 (1.3 to 5.8)	

OR, Odds ratio.

Table 2 Association of marital characteristics with incident sexually transmitted infection

	N	n (%)	OR* (95% CI)	p Value
	1552	52		
Age at marriage (years)				p Value for trend 0.45
<18	130	8 (6.2)	1	
18–20	383	15 (3.9)	1.0 (0.4 to 2.7)	
21–24	564	16 (2.8)	0.8 (0.3 to 2.2)	
≥25	475	13 (2.7)	0.8 (0.3 to 2.2)	
Ever experienced verbal abuse from husband				
No	1333	42 (3.5)	1	0.77
Yes	219	10 (4.6)	1.1 (0.5 to 2.3)	
Ever experienced physical abuse from husband				
No	1406	43 (3.1)	1	0.39
Yes	146	9 (6.2)	1.4 (0.7 to 3.0)	
Ever experienced sexual abuse from husband				
No	1497	46(3.1)	1	0.03
Yes	55	6 (10.9)	3.0 (1.2 to 7.5)	
Current concern about husband's habits (e.g. alcohol)				
No	1224	33 (2.7)	1	0.11
Yes	328	19 (5.8)	1.7 (0.9 to 3.0)	
Current concern about husband's affairs				
No	1533	50 (3.3)	1	0.21
Yes	19	2 (10.5)	3.0 (0.7 to 13.4)	

OR, Odds ratio.

*Adjusted for ethnicity, toilet in home, tapwater in home, difficulty managing financially and household size.

Table 3 Association of reproductive characteristics with incident sexually transmitted infection

	N	n (%)	OR* (95% CI)	p Value
Ever pregnant				
Ever	1550	58 (3.7)	1	0.52
Never	630	6 (1.0)	0.6 (0.1 to 2.7)	
Pregnant in past year				
No	1952	56 (2.9)	1	0.87
Yes	228	8 (3.5)	0.9 (0.4 to 2.0)	
Age at first pregnancy† (years)				p Value for trend 0.83
<20	231	14 (6.1)	1	
20–29	1185	41 (3.5)	1.1 (0.5 to 2.2)	
30–39	134	3 (2.2)	0.8 (0.2 to 2.9)	
Main method of contraception‡				
None	505	16 (3.2)	1	0.37
Sterilised	417	15 (3.6)	0.9 (0.4 to 2.0)	
IUCD	65	4 (6.2)	2.9 (1.0 to 8.4)	
Condom	144	2 (1.4)	0.5 (0.1 to 2.3)	
Other	354	13 (3.7)	1.3 (0.6 to 2.7)	
Pregnant since previous round‡§				
No	3943	62 (1.5)	1	0.21
Yes	61	3 (4.9)	2.4 (0.7 to 8.0)	
BV at start of period ³⁻⁵				
No	3288	46 (1.4)	1	0.38
Yes	624	14 (2.2)	1.3 (0.7 to 2.5)	
BV currently ^{3¶}				
No	3364	42 (1.2)	1	<0.001
Yes	538	22 (4.1)	2.7 (1.6 to 4.6)	
Candidiasis currently ³⁻⁵				
No	3588	61 (1.7)	1	0.28
Yes	313	3 (1.0)	0.6 (0.2 to 1.8)	

BV, Bacterial vaginosis; IUCD, intrauterine contraceptive device; OR, odds ratio.

*Adjusted for ethnicity, toilet in home, tapwater in home, difficulty managing financially and household size.

†Among 1550 ever-pregnant women.

‡Among 1552 married women only.

§For these time-changing variables, the figures relate to time periods at risk (up to two per woman).

¶Restricted to the 1968 with adequate vaginal smears at follow-up.

Table 4 Final multivariate model of factors associated with incident sexually transmitted infections

	N	n (%)	Adjusted OR* (95% CI)	p Value
Marital status				
Single	555	4 (0.7)	1	<0.001
Married—no sexual violence or concern about husband's affairs	1482	45 (3.0)	4.1 (1.5 to 11.6)	
Married—either sexual violence or concern about affairs	70	7 (10.0)	12.3 (3.5 to 43.6)	
Divorced/separated/widowed	73	8 (11.0)	12.3 (3.5 to 43.4)	
Tapwater in house				
Yes	974	16 (1.6)	1	0.01
No	1206	48 (4.0)	2.1 (1.1 to 3.8)	
Toilet in home				
In house	885	13 (1.5)	1	0.01
Outside house	1295	51 (3.9)	2.1 (1.1 to 4.1)	
Ethnicity				
Goan	1980	50 (2.5)	1	0.007
Non-Goan	200	14 (7.0)	2.5 (1.4 to 4.7)	
Pregnant since previous round†				
No	3943	62 (1.6)	1	0.17
Yes	61	3 (4.9)	2.6 (0.8 to 8.8)	
Household size				
1–3	348	15 (4.3)	1	0.02
4–5	1186	25 (2.1)	0.5 (0.3 to 1.0)	
6–9	570	17 (3.0)	0.9 (0.4 to 1.9)	
≥10	76	7 (9.2)	2.3 (0.9 to 6.0)	
BV currently²				
No	3364	42 (1.3)	1	0.001
Yes	538	22 (4.1)	2.8 (1.6 to 4.8)	

BV, Bacterial vaginosis; OR, odds ratio.

*Odds ratios for socioeconomic and behavioural variables are adjusted for each other. Odds ratios for bacterial vaginosis are adjusted for all other variables in the table.

†For these time-changing variables, the figures relate to time periods at risk (up to two per woman).

in men can increase the risk of genital ulcer disease and HIV.^{29–30} Poor hygiene may reflect social disadvantage, as in a prospective study of socioeconomic status and HIV infection among men attending STD clinics in Pune, India,³¹ which found that HIV incidence was highest among the most socially disadvantaged men. Low socioeconomic status may also reflect an economic dependency, which makes it difficult for these women to leave abusive relationships.

Previous cross-sectional studies have shown that bacterial vaginosis is associated with an increased risk of gonorrhoea,^{32–33} and a lack of lactobacilli has been associated with *C trachomatis*/*T vaginalis*.³⁴ Our results confirm data from the United States, which found a significant association between concurrent infections of bacterial vaginosis and *N gonorrhoea*/*C trachomatis* (OR 2.83, CI 1.8 to 4.4).³⁵ A prospective study of women in Kenya found a significant association between bacterial vaginosis and the acquisition of *T vaginalis* and HIV, and a weaker association with *C trachomatis*.³⁶ Bacterial vaginosis is characterised by disequilibrium in vaginal microflora with a reduction in hydrogen peroxide-producing lactobacilli and increased growth of anaerobic organisms. As lactobacilli help to maintain the normal pH of the vagina through the production of lactic acid, the increased vaginal pH associated with bacterial vaginosis may create conditions conducive to the persistence of pathogenic organisms.³⁷

Limitations of our study include the small number of incident cases of STI, different methods of sample collection for married and unmarried women, possible selection bias as a result of refusal to participate (particularly younger women), refusal to consent to gynaecological examination, loss to follow-up, and lack of data on sexual behaviour during follow-up. The study was vulnerable to the misreporting of sensitive behaviour, but asking about behaviour at baseline should have minimised

differential reporting bias with respect to STI incidence, and non-differential misclassification would tend to underestimate any associations. We lacked independent data on spousal sexual behaviour, however, or symptoms to validate the reported behaviour.

In summary, this population-based cohort study among women in India highlights the vulnerabilities of socially disadvantaged women to STI. The finding of a high risk among married women reporting spousal sexual abuse suggests that healthcare professionals treating sexually transmitted diseases need to be aware of possible sexual violence, and ensure that patients are screened and provided with the necessary support. Reproductive health clinics could provide a necessary entry point for women who experience violence to seek counseling, education, care, and perhaps protection. In addition, the low level of reported extramarital sex and the vulnerability of married women to STI and HIV through infection by their husbands highlights the need for STI prevention programmes

Key messages

- ▶ Sexual intercourse outside marriage was rarely reported in this Indian population, and women are at risk of becoming infected within marriage, especially those with sexual violence.
- ▶ This highlights the vulnerabilities of socially disadvantaged married women in India, and the need for healthcare professionals to screen STI patients for violence, and provide the necessary support.
- ▶ The results also stress the importance of effectively diagnosing and treating married men with STI and promoting safer sex within marriage.

among married couples, including a consideration of the promotion of condom use within marriage, and female-controlled preventive methods such as vaginal microbicides. The results also highlight the increased risk among widowed women, and the importance of effectively diagnosing and treating men with STI, as this may prove to be an effective control strategy for the general population.

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