

Research Article

Study of Pap smear and other feasible tests among self reported symptomatic married women in reproductive age group (15-49 yrs) regarding reproductive tract infections in a rural community of Maharashtra

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ABSTRACT

Background: Reproductive tract infections (RTIs) represent a major public health problem in developing countries. Integrating RTIs/STIs management and early detection of cervical dysplasia in broader reproductive health services can improve women's health. The objectives of the study were 1. To study the association of socio-demographic & reproductive factors among self-reported symptomatic women for reproductive tract infections. 2. To carry out clinical examination & feasible tests like PH, gram staining, VDRL for reproductive tract infections. 3. To study Pap smear among study subjects.

Methods: A cross sectional study community based study was carried out in villages under 'Parol' Primary Health Centre of Thane district, Maharashtra, India. A total of 415 married women in reproductive age group were interviewed and examined. Pre-structured, pre-designed questionnaire was used. Clinical examination & feasible laboratory tests were done. Results were analyzed with the help of Microsoft Excel & SPSS 15.

Results: A total of 415 women were interviewed, of them 263(63.4%) had one or more symptoms of reproductive tract infections. On examination, 69(35%) had cervicitis and 30(15.2%) pelvic inflammatory disease, 39(19.8%) bacterial vaginosis and candidiasis in 61(31%). Cervical erosion was present in 147(74.6%) women. On Pap smear, 20(10.2%) women had ASCUS (Atypical squamous cells of undetermined significance). Only 2(1%) women found HIV positive. No woman was found VDRL reactive.

Conclusion: Routine RTI/STI screening and periodic surveys to detect the infection patterns which will helps to control HIV infections in the community is needed in the remote tribal area as the current study shows high prevalence of reproductive tract infection.

Keywords: Pap smear, Reproductive tract infections, Rural India

INTRODUCTION

Women suffer from reproductive morbidities for a long time because of the prevailing 'culture of silence'.¹ Operationally, reproductive health care includes

prevention and treatment of RTI/STIs, HIV/AIDS, diagnosis and treatment for cervical cancers. World Health Organization's first global strategy on reproductive health was adopted by the 57th World Health Assembly (WHA) in May 2004 which has one of the

components as prevention and treatment of sexually transmitted infections, including HIV, reproductive tract infections, cervical cancer, and other gynecological morbidities.² Cervical cancer has a global prevalence of 20%.³ Due to low literacy level, limited exposure to mass media & interpersonal communication, rural reproductive population has a very poor perception of their sexual health. Absence of female service providers, lack of privacy and distance inhibit women from seeking treatment. Hence, it is important to provide accessible RTI/STI services at the community level. Wealthy countries have managed to reduce cervical cancer deaths by 80 percent thanks to the widespread use of regular pap smears.⁴ Pap smear for early detection of cervical cancer is to be used for laboratory screening.⁵ The enormous disparity in cervical cancer deaths between industrialized and developing nations is largely attributed to availability of cervical screening. Screening offers the best method for identifying women with early (asymptomatic) lesions. The main problem in conducting the community based study in rural India is its feasibility and accessibility to the population in need. The villages are diversely arranged and situated at a longer distance, with poor transport facilities; it becomes very difficult for these women to seek health care. This study was carried out with objectives as follows.

Objectives

1. To study the association of socio-demographic & reproductive factors among self reported symptomatic women for reproductive tract infections. 2. To carry out clinical examination & feasible tests like PH, gram staining, VDRL for reproductive tract infections. 3. To study Pap smear among study subjects.

METHODS

A cross sectional study community based study was conducted during the period of Nov. 2007 to Dec. 2008 in villages situated in Vasai Taluka of Thane district under primary health centre, Parol. Married women of reproductive age group (15-49 yrs) willing to participate in the study & symptomatic women for RTI/STI, willing to give consent for the examination & investigations were involved. Total number of married women in 15-49 yrs age group was 4150, of them 10% were considered for study purpose i.e. 415. These women were asked about the symptoms of the reproductive tract morbidities, 263 women were found to be symptomatic which were also called for speculum examination.

Baseline survey

Inclusion Criteria: 1. Resident of study area. 2. Ever married women. 3. Reproductive age group (15 -49 yrs). 4. Willing to participate in the study.

Exclusion Criteria: 1. Unmarried women of reproductive age group. 2. Not willing for interview. 3. Age below 15 years and above 49 years.

Examination and investigation:

Inclusion Criteria: 1. Symptomatic women for RTI/STI. 2. willing to give consent for the examination. 3. Willing for getting investigations done.

Exclusion Criteria: 1. Asymptomatic women. 2. Unmarried women. 3. Menstruating women. 4. Symptomatic women not willing for examination and investigation.

Survey Method: A stratified random household sampling method was used for ever married, non-pregnant women of age 15–49 years listed out from the registered population. Random selection of houses from each villages and padas proportionate to their population was done. During the household survey, if more than one eligible woman were present in one house, were included. If no woman was found in selected house, then next house was taken. A survey of ever married women about sociodemographic characteristic along with the enquiry of symptoms of RTIs/STIs

- Clinical examination and investigation including
 - ✓ Speculum examination of Cervix
 - ✓ Cervical and vaginal specimen collection for gram stain and PH.
 - ✓ Pap smear from cervical squamocolumnar junction.
 - ✓ Blood collection for VDRL and HIV.

Working Definitions and Criteria Used

1. **Age:** Age is assessed as a direct response by the study subject to the question, recorded in the form of actual completed age in years and checked in PHC registered population.

2. **Ever married woman:** The woman who has been married at least once at the time of survey.

3. **Menstrual hygiene:** (1) Reused clothes: Use of same clothes for soaking menstrual blood for more than two cycles. (2) Once used: Use of washed clothes for one or two cycles only. (3) Disposable pads: Sanitary pads available commercially.

4. **Symptomatic women for RTI/STI:** Those women who are having at least one symptoms suggesting of RTI/STI as: Vaginal discharge, Genital itching, Genital ulceration, Burning micturition, lower abdominal pain.

5. **Abnormal discharge:** a) Presence of abnormal discharge during examination, described in terms of amount, colour, consistency, smell, site and its

association with itching. b) Microscopically - Five pus cells per high-power field was also considered as abnormal discharge.

6. *Genital ulcers*: Presence of vesicles, papules, ulcers at labia, vulva, cervix.

7. *Cervicitis*: a) Presence of cervical erythema, inflammation or cervical bleeding on touch, with or without discharge. b) Microscopically - Presence of cervical pus cells > 10 per high-power field.

8. *Cervical erosion*: A bright red, clearly defined area on the vaginal aspect of the cervix where squamous epithelium is replaced by columnar epithelium.

9. *Pelvic inflammatory disease*: Presence of abdominal tenderness and uterine tenderness with or without adnexal tenderness.

10. *Vaginal pH testing*: Vaginal Ph was determined by dipping a pH paper into the discharge present on the

vaginal speculum after removing from vagina to differentiate the different types of infection. Ph of > 4.5 was used as a diagnosis for bacterial vaginitis and Ph >5.5 for trichomonas vaginitis.

11. *Amine test*: It was done by adding a drop of 10% KOH on vaginal discharge taken on a clean microscopic slide, intense fishy odour indicated bacterial vaginitis.

12. *Gram-staining*: This was used for the test of Gram-negative coccobacilli (clue cell) suggestive of bacterial vaginitis and presence of Gram-positive yeast bodies suggesting Candidiasis.

13. *Amsel criteria*: For bacterial vaginitis a positive diagnosis is made if 3 of the following four criteria are present: (1) P/S – Homogenous discharge. (2) Clue cell – On microscopy (>20%). (3) Vaginal pH – > 4.5. (4) A fishy Odour is produced when 10% of KOH is added to vaginal secretions.

Table 1: Diagnostic criteria for clinically diagnosed RTIs, laboratory diagnosed RTIs and other gynaecologic conditions.

Diagnosis	Diagnostic criteria
<i>Clinically diagnosed RTIs.</i>	
1. Cervicitis	Cervical erosion with purulent discharge from the cervix.
2. Pelvic inflammatory disease	Adnexal tenderness and/or the presence of tender adnexal mass on bimanual pelvic examination
<i>Laboratory diagnosed RTIs.</i>	
1. Endogenous infections.	
i. Bacterial vaginosis.	Presence of at least three of the following: (a) watery vaginal discharge, (b) elevated pH (>6), (c) positive amine odor test, (d) presence of clue cells in gram-stained vaginal smear.
ii. Vaginal candidacies	Presence of clinical signs (red, inflamed tissue and curdy white discharge)
<i>STIs</i>	
i. Syphilis. Current infection	Positive serology by rapid plasma reagin test.
Past infection	Positive result on the <i>Treponema pallidum</i> particle agglutination test.
ii. Gonorrhoea.	Identification of gram- negative intracellular diplococci in Gram-stained cervical smear.

Table 2: Laboratory evaluation of vaginal discharge.

	Normal	Trichomonas	Bacterial vaginosis	Candida	Cervicitis
PH	<4.5	>4.5	>4.5	<4.5	Variable, usually >4.5
Abnormal odour (positive whiff test)	No	Yes	Yes	No	No
Gram stain	Gram-positive rods	Trichomonas (flagellated organisms)	Gram-negative coccobacilli	Budding yeast or hyphae	Gram-negative intracellular diplococci ^a

^a If *Neisseria gonorrhoeae*

Table 3: Socio-demographic & reproductive characteristics of symptomatic women.

Socio-demographic characteristics	Women with RTI symptoms (n= 263)	p-value
Age (in years)	15-24	75 (28.5%)
	25-34	128(48.7%)
	≥35	60(22.8%)
Education	Illiterate	164(62.4%)
	1-4th std	18(6.8%)
	5-10th std	75(28.5%)
	>11th std	06(2.3%)
Occupation	Housework	75(28.5%)
	Labour work	151(57.4%)
	Farming	17(6.5%)
	Other jobs	20(7.6%)
Socio-economic status	Upper	02 (0.8%)
	Upper Middle	21 (8.0%)
	Lower Middle	27 (10.3%)
	Upper Lower	78(29.7%)
	Lower	135(51.3%)
Reproductive history		
Age at marriage	<18yrs	162(62%)
	18-20 yrs	71 (27.0%)
	21-25 yrs	26 (9.9%)
	>25yrs	03 (1.1%)
Age at birth of first baby	Not applicable	21(8.0%)
	<18yrs	98(37.3%)
	18-20 yrs	103(39.2%)
	21-25 yrs	34(12.9%)
	>25yrs	07 (2.7%)
Pregnancies	0	19 (7.2%)
	1-3	157 (59.7%)
	>4	87 (33.1%)
Place of delivery	Not applicable	21 (5.1%)
	Home	247 (59.5%)
	Hospital	147 (35.4%)
Menstrual hygiene	Reused clothes	213 (81.0%)
	Once used	42 (16.0%)
	Disposable pads	08 (3.0%)
Sex during menses	Yes	55 (20.9%)
	No	208 (79.1%)

RESULTS

The socio-demographic characteristics and reproductive history of the study population are depicted in Table 3. Majority of the study population 51.3% belonged to lower class socio-economic status as per the modified BG Prasad classification (2008) and with 48.7% was in 25-34 yrs age group. Most of the women (62.4%) were illiterate and more than half (57.4%) were labourer by occupation. Mean age at menarche and marriage was 13.5 and 16.5 yrs respectively. 59.5% were home deliveries & 52.8% of them were done by untrained personnel. Majority (81%) of

the women reported of having reuse of cloths and almost 21% of them were indulged in vaginal intercourse during their menses.

A total of 263 (63.4%) women were found to be symptomatic out of which 197 women undergone speculum examination and investigations. On Pap smear examination, high nucleocytoplasmic ratio was present in 19 (9.6%) women, ASCUS (Atypical squamous cell of undetermined significance) in 20 (10.2%) women, bacterial vaginosis in 32 (16.2%) women and candidiasis in 61(31%) women as shown in table 4.

Table 4: Pap smear result among the study population.

Pap smear results (n=197)		No.	%
Inflammation	0	08	4.1
	1+	43	21.8
	2+	124	62.9
	3+	22	11.2
Candida	Present	61	31
Cellularity	Present	71	36
Endocervical cells	Present	66	33.5
High N/C ratio with nuclear atypia	Present	19	9.6
Impression on pap smear	ASCUS	20	10.2
	Bacterial vaginosis	32	16.2
	Candidiasis	61	31

(ASCUS: Atypical squamous cell of undetermined significance)

Table 5: Gram stain result among the study population.

Gram stain results (n=197)		No.	%
Pus cells on gram stain	Plenty pus cells present	124	62.9
	Moderate pus cells present	40	20.3
Gram negative rods	Present	32	16.2
Clue cells	Present	39	19.8
Gram negative coccobacilli	Present	7	3.6
Impression on Gram stain	Active infection	73	37.1
	Chronic infection	51	25.8
	Normal vaginal flora	34	17.3
	Bacterial vaginosis	39	19.8

As shown in table 5 that, active infection in 73 (37.1%), chronic infection in 51 (25.9%), and bacterial vaginosis in 39 (19.8%) women.

Table 6 shows that cervical erosion was present in 147 (74.6%) women and more in women using reused clothes for menses (77.8%).

Table 6: Menstrual hygiene and cervical erosion.

Menstrual hygiene	Cervical erosion		Total	p-value
	Yes	No		
Reused clothes	130 (77.8%)	37 (22.2%)	167	0.021
Once used	13 (52.0%)	12 (48.0%)	25	
Disposable pads	04 (80.0%)	01 (20.0%)	05	

Table 7: Pap smear and cervical erosion.

Pap smear findings		Cervical Erosion		p-value
		Yes	No	
Inflammation	0	8 (5.4%)	-	0.017
	1+	30 (20.4%)	13 (26.0%)	
	2+	95 (64.6%)	29 (58.0%)	
	3+	14 (9.5%)	8 (16.0%)	
High N/C ratio with nuclear atypia	Present	19 (12.9%)	128 (87.1%)	0.007
	Absent	-	50 (100.0%)	
Impression on Pap smear	NILM	117 (79.6%)	47 (94.0%)	0.011
	ASCUS	19 (12.9%)	01 (2.0%)	
	Bacterial vaginosis	05 (3.4%)	01 (2.0%)	
	Unsatisfactory smear	06 (4.1%)	01 (2.0%)	

Table 7 shows that an abnormal finding in Pap smear positively relates with the presence of cervical erosion.

DISCUSSION

Symptoms of RTI/STIs

In the present study, 63.4% women had one or more symptoms of RTIs including vaginal discharge in 57%, burning micturition in 43%, genital itching in 45%, genital ulceration in 17%, and lower abdominal pain in 42% women. All the five symptoms were present in 13.5%, four symptoms in 17.8%, three symptoms in 22.6%, two symptoms in 29.1% on an average.

Similar findings were observed in a study done by Joseph A et al.⁶ in rural Tamil Nadu, 240(53%) women reported symptoms suggestive of RTIs, including white discharge (44%), burning sensation while passing urine (19%) and vaginal itch (12%). Among those reporting symptoms, 171(38%) women had one symptom, 45(10%) had two symptoms and 23(5%) women had all three symptoms.

Clinical findings

Active discharge was present in 94.4% women, curdy white discharge in 59.4% women, yellowish in 25.4% and blood stained in 9.6% in the present study. These

findings are comparable with those in the study by Patel V. et al.⁷ conducted in rural area in Goa, wherein the commonest colour of the vaginal discharge was curdy white (82.5%) followed by yellow (14.1%). Half the women (47.8%) reported their discharge to foul smell, which 69.5% was in the present study.

Cervical erosion was present in 147(74.6%) women, which is much more than women in urban area in Nagpur, Maharashtra (23%) in the study conducted by Kulkarni RN et al.⁸ In the same study along with cervical erosion, high inflammatory smears (76%) were present with mild dysplasia (9.75%) and moderate dysplasia (2.43%). Whereas, in the present study, higher inflammation (> 2+) is present in 109(74.1%) women out of 147 with cervical erosion. PH of 6 or more was present in 86.8% women.

Clinically 35% were diagnosed for cervicitis, 15.2% for pelvic inflammatory disease. Clinical categorization or bacteriological differentiation by various Indian investigators has revealed an alarmingly high prevalence of more serious forms of RTIs in the form of cervicitis (ranging from 48.7% to 86%) and PID (24.2% to 45.1%). The less number of women with cervicitis in the present study compared to other could be because of lack of higher investigations (Ex. PCR for Chlamydia, etc.).

Laboratory findings

Diagnosis on Gram stain: Active infection was present in 37.1% women, chronic infection in 25.8% women, bacterial vaginosis in 19.8% and abnormal gram smears with gram negative coccobacilli and rods in 37% in the present study. Similarly the study in Mumbai in low risk group by Joshi JV et al.⁹ also found that the overall positivity for RTIs as 29%, out of which bacterial vaginosis was highest (21.2%), followed by cervicitis (18%).

Diagnosis on Pap smear: In the present study, 10.2% women had ASCUS (Atypical squamous cells of undetermined significance), 16.2% had bacterial vaginosis, 31% had candidiasis, and in 39% smears, no abnormality was found.

No woman was found VDRL reactive, but only 2(1%) women found HIV positive. These findings were comparable with the findings in NFHS-3,¹⁰ HIV positive women among 15–49 yrs age group was 0.18% in rural India and 0.48% in Maharashtra. The finding in present study can be by chance but we cannot ignore the possibility of hidden cases of HIV among these women.

CONCLUSION

The cross-sectional community based study was conducted among ever married women living in tribal area wherein the baseline survey was conducted. Symptomatic women were counseled and invited for the speculum examination and other investigations for RTI/STIs. Clinical and laboratory diagnosis for RTI/STIs along with the screening for cervical cancer by Pap smear was carried among symptomatic women. The study finding suggests that even without sophisticated laboratory facilities, Primary health centers can do more to diagnose and treat RTIs. It is necessary to increase awareness among rural women regarding the symptoms and consequences of RTIs/STIs and cancer cervix. Routine RTIs/STIs screening and periodic surveys should be done to detect the infections and this will help in preventing the disease & reducing the ignorance for RTIs/STIs symptoms.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Panda SC, Sarangi L, Bebartta D, Parida S, Panigrahi OP. Prevalence of RTI/STI among

2. WHO. Reproductive health strategy to accelerate progress towards the attainment of international development goals and targets. Geneva: World Health Organization, 2004.
3. Claeys P, Gonzalez C, Gonzalez M, Van Renterghem L, Temmerman M. Prevalence and risk factors of sexually transmitted infections and cervical neoplasia in women's health clinics in Nicaragua *Sex Transm Infect* 2002;78:204–207.
4. WHO. Department of Reproductive Health and Research (RHR). Health education to villages, Sexually transmitted and other reproductive tract infections, A guide to essential practice STI/RTI basics Chapter 3. Detecting STI/RTI, Geneva: World Health Organization, 2006.
5. Cherian Varghese, N.S. Amma, K. Chitrathara, Namrata Dhakad, Preetha Rani, Letha Malathy, & M.K. Nair, Risk factors for cervical dysplasia in Kerala, India. *Bulletin of World Health Organization*, 1999;77(3):281-283.
6. Joseph A, Jasmin Prasad and Sulochana Abraham. Reproductive Tract Infections Among young married women in Rural Tamil Nadu, *International Family Planning Perspectives*, 2005;31(2):73–82
7. Patel V, Weiss HA, Mabey D, West B, D'Souza S, Patil V, Nevrekar P, Gupte S and Kirkwood BR. The burden and determinants of reproductive tract infections in India: a population based study of women in Goa, India. *J. Sexually Transmitted Infections*. 2006; 82:243-49.
8. Kulkarni RN, Durge PM. Role of socio-economic factors and cytology in cervical erosion in reproductive age group women, *Indian J Med Sci* 2002;56:598-601.
9. Joshi JV, Hazari KT, Shah RS, Chitlange SM, Meherji PK, Gokral JS, Mali BN, Palayekar VV, Balaiah D, Savardekar LS et al. Reproductive tract infection in women attending family welfare clinics. *Indian Journal of Sexually Transmitted Diseases*. 1996;17(2): 66-70.
10. National Family Health Survey (NFHS)-3. International Institute for Population Sciences Mumbai, Government of India, NACO, NARI, USAID, UNICEF, UNPF, Department for International Development (United Kingdom), the Bill and Melinda Gates Foundation, December 2005 to August 2006.

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