

Original Research Article

Community based study of reproductive tract infections among women of the reproductive age group in a rural community of Eastern India

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ABSTRACT

Background: RTI/STIs have a profound impact on sexual and reproductive health worldwide, the symptoms of which often goes unnoticed and women suffers from devastating consequences. The present study was conducted to analyse the prevalence of RTIs based on a syndromic approach among women of 15 to 49 years age, supported by both laboratory and clinical diagnosis to measure the actual magnitude of morbidity associated with RTIs among the study population. The objective of the study were to study the prevalence of reproductive tract infection among the women of reproductive age group (15-49 years), to find out the etiological diagnosis and to assess the socio-demographic profile of the study population.

Methods: A cross-sectional study was carried out among 312 women aged 15-44 years in a rural area in West Bengal, using the WHO-Syndromic Approach for diagnosis and management of RTIs/STIs.

Results: The prevalence of RTIs among the reproductive age group women was 43.6% based on their symptoms of RTI, with majority having abnormal vaginal discharge. According to laboratory investigations the most common cause of RTI was bacterial vaginosis which was 67.4% (using Amsel's criteria) and 31.7% (as per Nugent's score), followed by Vulvovaginal candidiasis which was found in 12.4%.

Conclusions: RTI among women of reproductive age is quite a common morbidity. It is the need of the hour to educate women about reproductive health issues and encourage them to seek treatment for their problems and wherever possible both clinical and laboratory findings should corroborate self reported morbidity to know the exact prevalence of any disease in the community.

Keywords: Reproductive tract infections, Clinical findings, Laboratory tests, Symptoms

INTRODUCTION

India is witnessing an unprecedented epidemiological and demographic transition, with increased chronic disease burden on the one hand and declining mortality and fertility rates on the other. The spread of certain chronic and communicable diseases is posing a public health as well as a developmental challenge for the country. Hence, issues concerning health needs of the people, especially those impinging on women's health have received significant policy and programmatic responses in the

recent past. The concept of reproductive health has been used to define a wide range of health concerns relating to events that surround or affect human reproduction. The basic elements of reproductive health are responsible reproductive/sexual behaviour, widely available family planning services, effective maternal care and safe motherhood, effective control of reproductive tract infections (RTIs) including sexually transmitted infections (STIs), prevention and management of infertility, elimination of unsafe abortion, and prevention and treatment of malignancies of reproductive organs.

Reproductive tract infections (RTIs) are infections affecting the reproductive tract and can be endogenous infections (resulting from the organisms normally existing in the vagina), iatrogenic infections (resulting from abortions, insertion of IUD, child birth), and sexually transmitted infections.¹ It is responsible for major ill-health throughout the world. RTI/STIs have a profound impact on sexual and reproductive health worldwide, and rank among the top five disease categories for which adults seek health care.

About 40% of women in India are estimated to have RTI/STI at any given point of time, but only 1% completes the full treatment of both partners.² According to DLHS 3 (2007-08) 40.7% of women sought treatment for STI/RTI problems. In West Bengal overall 26.2% of women have any symptoms of RTI/STI. The prevalence was higher in the rural (27.2%) compared to urban areas (21.8%).³ 11% of women and 5% of men in the age group 15-49 in sexual relationship reported of STI/RTI related symptom in the last 12 months (The National Family Health Survey (NFHS-3)).⁴

In India, married women are reluctant to seek medical treatment because of lack of privacy, lack of a female doctor at the health facility, the cost of treatment and their subordinate social status. This reluctance is exacerbated when symptoms are embarrassing, as they are with RTIs, especially among adolescents. In a rural backdrop, where women does not have much liberty to move out of their houses and reach the health set-ups for their common ailments, find it rather embarrassing to disclose the problems of say "white discharge" which happens to be the most rampant symptom of RTI, to come ahead. A "culture of silence" shrouds gynecologic morbidity throughout India and elsewhere. Furthermore, women, more so than men, tend to regard RTI symptoms as normal discomfort and therefore often do not seek treatment.

The appearance of Human immunodeficiency virus (HIV) and Acquired immune deficiency syndrome (AIDS) has focused greater attention on the control of RTIs. The major modes of transmission of HIV/AIDS and RTI/STIs being the same, those suffering from RTI/STIs are at higher risk of contracting the HIV/AIDS virus.⁴ Effective management of RTIs is one of the cornerstones of RTI control, as it prevents the development of complications and sequelae, decreases the spread of those infections in the community, and offers a unique opportunity for targeted education about HIV prevention. The appropriate treatment of STI at the first contact between patients and health care providers is, therefore, an important public health measure.⁵

Thus to have a more real representation of reality, the present study was conducted to estimate the current prevalence of RTIs based on a syndromic approach among women between 15 to 45 years of age, in a rural area of Singur, West Bengal. It includes both laboratory

and clinical diagnosis to measure the actual magnitude of morbidity associated with RTIs among the study population. A medical diagnosis helps throw light on the factors linked with the risks of having these infections while inclusion of both clinical and laboratory diagnoses also helps to assess the efficiency of syndromic approach to screen women for RTIs. With the above view the present study was conducted to study the prevalence of reproductive tract infection among the women of reproductive age group (15-49 years) along with the socio-demographic factors influencing the occurrence of the disease and to find out the etiological diagnosis.

METHODS

The study was conducted in Dearah village of Singur, Hooghly, West Bengal, which is the rural field practice area of All India Institute of Hygiene and Public Health, Kolkata over a period of 12 months, between May 2013 to April 2014. Institutional ethics committee approval was obtained prior to the commencement of the study.

Study population

The study population comprised of women of the reproductive age group (WRA) 15-49 years residing in Dearah village. As per DLHS-3 (2007-2008) West Bengal, women of reproductive age group (15-49 years) who had any symptoms of RTI/STI was 27.2% among rural population. Considering this prevalence and a 10% non-response rate sample size was calculated. A total of 312 women of reproductive age group between 15-49 years were studied. All married women in the age group 15-49 years constituted the sampling frame. There were 779 married women in this group based on the voter's list. Using this as the sampling frame, 312 women were chosen through random sampling using computer generated random numbers.

Informed written consent was obtained from all patients before participation in the study, and full confidentiality was assured. Each study recruit was assigned a code number for future reference. Pregnant women and women who were very sick, moribund, those not willing to participate in the study and those who could not be contacted after 2 visits, were excluded from the study.

Study tools

Data collection was done using a pre-designed pre-tested semi-structured schedule which was developed from the standard schedule for evaluation of the National AIDS Control Program (NACP) constructed by WHO and adopted by the National AIDS Control Organisation (NACO) for Behavioral Surveillance Survey (BSS). Data was collected on the socio demographic information, obstetric history, contraceptive practices, personal and menstrual hygiene practices, knowledge about different symptoms of RTI as per WHO syndromic approach, source of knowledge and perceived symptoms of RTIs

and the treatment-seeking behavior of those who had symptoms suggestive of RTI.

The whole process of data collection had two phases: firstly, face to face interview with the researcher and secondly, clinical examination and collection of biological samples for the diagnosis of RTI.

Physical examination (vaginal, speculum, and bimanual) was carried out, to assess the presence of any abnormal discharge, genital ulcers, genital warts, cervicitis, cervical erosion, pelvic inflammatory diseases (PID), prolapse, etc. The symptomatic respondents were given referral slips and instructed to attend the Nasibpur UHC for clinical examination and laboratory tests. Four samples of vaginal swab was collected with the help of sterile cotton tipped swab sticks. The four swabs from each patient were used for four different tests as follows:

First swab

The first swab was rolled along a glass slide, a smear was made, which was allowed to air-dry. This was sent for gram staining to Microbiology Department, All India Institute of Hygiene and Public Health (AIIPH), in a cold box. Gram's staining was done for Nugent scoring. Women with intermediate flora (NS4-6) were excluded from analysis, to avoid false positive results.

Second swab

At the same time that the first swab was collected, the researcher placed the secretions from the second swab on pH indicator strips with a pH range of 3.5 to 6 to determine vaginal pH.

Third swab

Two drops of 10% KOH solution were added to the third swab. Release of fishy amine odor signified a positive whiff test.

Fourth swab

This sample was taken to Public Health Laboratory (P.H. Lab.) at Singur. The sample from the fourth swab was combined with two drops of normal saline on a slide and covered with a cover slip and examined under high-power microscope to identify the clue cells. The tests were carried out as per standard techniques as detailed below.

For unmarried symptomatic participants, per speculum examination was not done. They were explained in brief about the procedure of self administration of vaginal swabs which was used for vaginal smear collection. The use of self administered swabs had been piloted in another study in Goa, and was shown to be a reliable method of collection of vaginal specimens for the diagnosis of endogenous infections.⁶ Women with

menstrual bleeding at the time of clinical examination were asked to come for gynecological examination after cessation of menstrual bleeding.

Laboratory techniques²⁴⁻²⁷

Wet mount preparation

Wet mount preparations are especially valuable for demonstrating motility in microorganisms. Fresh samples are used for maximum motility. No stain is employed since most stains kill the organisms (except vital stains). It is also useful for giving clear images of fresh specimens under the microscope. Wet mount detects *Trichomonas vaginalis* and clue cells apart from different protozoa, fungi and inflammatory cells which can be recognized too.

Amine odour whiff test

A positive "whiff test" is indicative of an overgrowth of anaerobes in the vagina.

Vaginal pH test using pH indicator paper

The vaginal pH test includes a piece of pH test paper and a color chart for determining vaginal pH results. To perform the test, the researcher placed the secretions from the second swab on pH indicator strips with a pH range of 3.5 to 6 to determine vaginal pH. Next, the color of the pH test paper is compared to the color chart. If vaginal pH is above normal, the most likely reason is bacterial vaginosis (BV) and not a yeast infection.

Gram stain

For the laboratory confirmation, bacterial vaginosis was diagnosed on gram staining when the stain showed mixed flora consisting predominantly curved gram negative or gram variable or gram variable rods and / or gardenella and bacteroides morphocytes, while lactobacilli were either typically absent or very few in number. Diagnosis of Bacterial vaginosis was done using Amsel's criteria and Nugent's score. All the participants who were examined and had their samples examined were contacted personally by the researcher to hand over their reports which were duly signed by Assistant Professor, Dept. of Microbiology, AIIPH. Those who tested positive were treated as per National Guidelines on Prevention, Control and Management of reproductive tract infection (MoHFW, 2007).

Statistical methods

Data was collated manually, checked for errors and entered into the computer. Computer software Statistical Package for Social sciences (SPSS) version 20 was used for the analysis. Chi-square test was used to analyse the significance of associations. A p value of less than 0.05 was considered significant.

RESULTS

Study population

The women ranged in age from 15 to 54 years and approximately one-fourth of the study populations were aged between 20-24 yrs constituting 23.3% of the total population with the mean age of 28.06 ± 8.2 yrs. The prevalence of RTI symptoms was highest in the age group 15-19 years (66.7%) followed by 25-29 years (48.4%) and this pattern showed a significant association ($p=0.005$). 86.2% of the study population were Hindus and 13.8% were Muslims. The prevalence of RTI symptoms was highest among Hindus (43.8%) and this pattern did not show any significant association ($p=0.869$). 56.4% of the study population were from nuclear family and others from joint family. The

prevalence of RTI symptoms was highest in joint families (44.1%) though this pattern did not show any significant association ($p=0.818$). Majority of study population i.e. 77.8% were homemakers followed by students (13.8%). The prevalence of RTI symptoms was highest among homemakers (45.6%) and this pattern showed a significant association ($p=0.005$). 38.8% of the study population completed education upto Class VIII, 28.5% completed Cl.X and 8% were illiterate. The prevalence of RTI symptoms was highest among illiterates (56.0%) and this pattern did not show any significant association ($p=0.475$). Most of the of the study population, 45.5% belonged to upper lower socio economic class and 34.3% were from lower class. No one belonged to upper socioeconomic class. The prevalence of RTI symptoms was highest among those belonging to Class V i.e. lower socio economic group (48.5%) and this pattern showed a significant association ($p=0.005$) (Table 1).

Table 1: Distribution of study population according to their sociodemographic profile (n=312).

Sociodemographic profile	Number (%)	RTI (n%)	
Age (in years)			
15-19	51 (16.3)	34 (66.7)	$\chi^2=17.474$; df= 6 p=0.005
20-24	73 (23.3)	25 (34.2)	
25-29	64 (20.5)	31 (48.4)	
30-34	44 (14.1)	20 (45.4)	
35-39	40 (12.8)	14 (35.0)	
40-44	31 (9.9)	10 (32.2)	
≥45	9 (2.8)	2 (22.2)	
Religion			
Hindu	269 (86.2)	118 (43.8)	$\chi^2=0.085$; df=1 p=0.869
Muslim	43 (13.8)	18 (41.8)	
Type of family			
Nuclear	176 56.4	76 (43.1)	$\chi^2=0.087$; df=1 p=0.818
Joint	136 43.6	60 (44.1)	
Type of house			
Kuchcha	38 (12.2)	20 (52.6)	$\chi^2=2.030$; df=2 p=0.362
Pucca	156 (50.0)	70 (44.8)	
Mixed	118 (37.8)	46 (38.9)	
Occupation of respondent			
Homemaker	241 (77.8)	110 (45.6)	$\chi^2=11.655$; df=3 p=0.005
Skilled worker	26 (7.7)	10 (38.4)	
Unskilled worker	2 (0.6)	0 (0.0)	
Student	43 (13.8)	16 (37.2)	
Education of study population			
Illiterate	25 (8.0)	14 (56.0)	$\chi^2= 4.540$; df= 5 p=0.475
Primary	24 (7.7)	8 (33.3)	
Middle	121 (38.8)	48 (39.6)	
Secondary	89 (28.5)	42 (47.1)	
Higher Secondary	27 (8.7)	14 (51.8)	
Graduate and above	26 (8.3)	10 (38.4)	
Socioeconomic scale (Modified Prasad Scale 2013 in Rs.)			
Class II	6 (1.9)	11 (6.6)	$\chi^2= 8.901$; df= 3 p=0.005
Class III	57 (18.3)	18 (31.5)	
Class IV	142 (45.5)	65 (45.7)	
Class V	107 (34.3)	52 (48.5)	

Table 2: Distribution of study population according to results of laboratory investigations of RTI (n=129*).

Laboratory tests for RTI	No. of women	Percentage
Trichomoniasis	0	0
Bacterial vaginosis (as per Amsel's criteria**)	87	67.4
Bacterial vaginosis (as per Nugent's score ≥ 7 ***)	41	31.7
Vulvovaginal Candidiasis	16	12.4
Tested negative	42	13.4

*Results were not mutually exclusive. **Amsel's criteria: any three out of following four criteria were considered as positive. i) Watery vaginal discharge ii) Vaginal pH more than 4.5 using pH indicator paper iii) Amine odour test positive (odour described as fishy after addition of 10% KOH), iv. Presence of Clue cells under microscope. ***Nugent's score: It is an accepted technique using microscopic examination of a Gram stained smear of vaginal discharge for determining bacterial vaginosis. The criterion for bacterial vaginosis: Total score of 7 or higher.

Table 3: Distribution of RTI symptomatics according to the symptoms of RTI and laboratory investigations (n=129).

Symptoms	Total N (%)	As per laboratory findings		
		Bacterial vaginosis (as per Amsel's criteria) N (%)	Bacterial vaginosis (as per Nugent's score) N (%)	Candidiasis N (%)
1.Genital discharge	126(100) (97.6)	87 (69.0)	41 (32.5)	16 (12.6)
2.Lower abdominal pain	87 (100) (67.4)	57 (65.5)	29 (33.3)	14 (16.0)
3.Itching	40 (100) (31.0)	21 (52.5)	15 (37.5)	5 (12.5)
4.Foul smelling discharge	24(100) (18.6)	17 (70.8)	10 (41.6)	6 (25.0)
5.Burning pain during micturition	2 (100) (1.5)	2 (100)	2 (100)	2 (100)

Presenting complaints

Among the total study population 136 were RTI symptomatics. Thus the prevalence of RTI was 43.6% as per the symptoms of RTI. Genital discharge was the most common symptom. 92.6% of the study population suffered from it followed by lower abdominal pain (63.9%). Least common symptom was burning pain during micturition-only 1.4% suffered from it but none of them had genital ulcer / sore, swelling in the groin or pain during sexual intercourse. 39.7% of the population had at least two symptoms.

Etiological diagnosis

Out of 136 RTI symptomatics, 129 respondents turned up for laboratory diagnosis, i.e. 7 out 136 (5%), did not turn up. So the non-compliance rate for laboratory test was 5%.According to laboratory investigations the most common cause of RTI was bacterial vaginosis. It was 67.4% (using Amsel's criteria) and 31.7% (as per Nugent's score), followed by vulvovaginal candidiasis-which was found in 12.4% (Table 2). Majority (97.6%) of the RTI symptomatics had genital discharge, out of which 69% was diagnosed to have bacterial vaginosis (BV) as per Amsel's criteria and 32.5% as per Nugent's score.

Candidiasis was diagnosed among 12.6% of them. The second most common symptom was lower abdominal pain, 67.4% of the respondents who appeared for the laboratory test complained about it. Amongst them 65.5%

had bacterial vaginosis (BV) as per Amsel's criteria, 33.3% as per Nugent's score and 16% had candidiasis (Table 3).

DISCUSSION

In this study it was observed that the prevalence of symptoms suggestive of reproductive tract infection (RTI) was found to be 43.6%. These findings were almost in line with other studies done in different parts of India. Similar findings are obtained in a study done among the rural married women (15-45 yrs) of Bundelkhand region of Uttar Pradesh, India by Singh et al.⁷ The overall prevalence of RTI was 44.6% (95%CI=0.39-0.50). A study done by Mamta, Kaur in Punjab shows the prevalence of RTI to be 45%.¹⁰ Another study showing the prevalence of reproductive tract infections among recently married women in Veerapandi Panchayat Union of Salem District, Tamil Nadu done by Kannan et al, showed the prevalence of RTIs to be 44.6%.⁸ A study done among rural women in Meerut by Jain et al, found the prevalence of RTIs to be 44.8%.¹² All these studies were almost in accordance with the present study. Though done in an urban set up, a study in Hubli, Karnataka by Sangeetha et al, and another in a slum of Kolkata, by Dasgupta, Sarkar showed the prevalence of RTI to be 40.39% and 43.3% respectively, which was also almost similar to the present study.^{13,23} On the contrary there were several studies which found the prevalence to be much lower than the present study. Studies done among in urban areas of Ludhiana, Goa,

rural areas of Rajasthan, urban slums of Tirupati town, Andhra Pradesh, Shimla City, showed the prevalence of RTI to be 17.3%, 28.3%, 31.8%, 35.6%, and 36.3% respectively.^{11,14,20-22} A cross-sectional study of a rural community in the Hooghly district of West Bengal, by Samanta et al, found the prevalence of RTI / STI symptoms in the last 12 months to be 13.6% among females which was also quite low compared to the present study.¹⁴ In a community-based study of Reproductive Tract Infections, including Sexually Transmitted Infections, among the rural population of Punjab by Jindal et al.¹⁵ 11.75% were found to be positive for various RTIs. Again this finding was very low as compared to the present study though the study setting was the same. This lower prevalence could be due to the wide-spread use of the syndromic approach in management of RTIs/STIs. However, it is still higher than the prevalence of RTIs reported in rural areas by DLHS-3, which was 19.6% in India and 27.2% in West Bengal. In a community based study conducted in rural West Bengal by Halder et al, the prevalence of RTI was as low as 9.9%, even lower than the national levels as per DLHS 3.^{3,9} This could be due to good community based awareness generation programmes. In spite of robust programmes and WHO syndromic approach for management of RTI, the prevalence of RTI was very high as reported in some studies conducted in the rural area of Surendranagar district by Komal et al, in district of Sirmour (H.P.) and in Surat, where it was 56.5%, 51.9% and 53% respectively.¹⁵⁻¹⁷

The present study revealed that genital discharge was the most common symptom reported by the study population (92%). The second most common symptom was lower abdominal pain, 63.9% suffered from it whereas the least reported symptom was burning pain during micturition (1.4%) vaginal discharge was also the commonest symptom reported in other studies in rural areas of India.^{7-9,13-16,22} Among the other symptoms low back pain was the commonest symptom in a study conducted in Goa and dysuria was reported to be commonest in a study conducted in Ludhiana.^{11,19} In the present study, none of them complained of genital ulcers and genital warts. This is an indication that awareness of RTIs and health-seeking behavior are inadequate in women, making them unable to relate their RTI symptoms accurately.

According to laboratory investigations the most common cause of RTI was bacterial vaginosis (BV). It was found to be 67.4% using Amsel's criteria and 31.7% as per Nugent's score. Next common cause was vulvovaginal candidiasis, which was found in 12.4% of the subjects. There were very few studies which had conducted laboratory tests. Among those who had conducted, BV was the most common finding in studies conducted in Andhra Pradesh (14.3%), in urban slums of Berhampur.¹² (17.4%) study conducted by Kosambia et al, where the prevalence of bacterial vaginosis by using Gram staining Nugent's criteria was found to be 25% among rural women and in a study conducted by Jindal et al where the

maximum positivity in females was that of bacterial vaginosis 11%.^{15,17,18} It was the second most important cause in a study conducted in Hubli, where 12.5% of the symptomatics had BV. Vulvovaginal candidiasis, was the second most common finding in the study conducted by Kosambia et al which was similar to this study.^{13,17} In a study conducted in Hubli it was found that Candidiasis was the commonest cause of RTI (16.1%). Jindal et al found Candidiasis among 4% of the symptomatics.¹⁵

CONCLUSION

This study shows that RTI among women of reproductive age is quite a common morbidity. The stigma, shyness and shame related to any disease of the genital tract desist many girls and women to seek medical care and even if they do it's too late to prevent the tragic consequences of RTI like acute illness, cancer, infertility, long-term disability, and death with severe medical and psychological consequences. Though RCH has ranked RTI especially among women as one of the most important challenges to be overcome, yet it still continues to contribute to the ill health of the women folk to a large extent. Raising the awareness of prevention, management and control of RTI must be inculcated to the women folk right from childhood especially through adolescence and motherhood. All organizations whether government or non-government catering to health care and health education services of the adolescent girls and adult women should give a lot of importance to the containment of this preventable malady. All women endowed with the correct knowledge will disseminate the same to their parents, peer group and their progeny.

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REFERENCES

1. Reproductive Tract Infection- Population Council Available at: <http://www.popcouncil.org/uploads/pdfs/RTIFacsheetsRev.pdf>. Accessed on 3 June 2018.
2. National AIDS Control Organization; 2007. GOI, MOHFW. National Guidelines on Prevention, Management and Control of Reproductive Tract Infections Including Sexually Transmitted Infections.

3. International Institute of Population Sciences (IIPS), Mumbai. District level Household and Facility Survey (DLHS III) 2007-08.
4. International Institute of Population Sciences(IIPS) and Macrointernational, 2007, National Family Health Survey (NFHS -3).
5. National AIDS Control Organization, Ministry of Health and Family Welfare, Government of India. National Behavioral Surveillance Survey (BSS) 2006 in general Population.
6. Tanksale V, Sahasrabhojane M, Patel V, Nevrekar P, Menezes S, Mabey D. The reliability of a structured examination protocol and self-administered vaginal swabs: a pilot study of gynecological out-patients in Goa, India. *Sex Transm Infect* 2003;79(3):251-3.
7. Singh D, Nigam V. An Epidemiological Study of Reproductive Tract Infection Among the Rural Married Women of Bundelkhand Region of UttarPradesh, India. *Int J Scientific Res*. 2014;3(4):353-6.
8. Thekdi KP, Patel KG, Patel NK, Thekdi PI. A cross sectional study on the prevalence of reproductive tract infections amongst married women in the rural area of Surendranagar district. *Int J Res Med Sci*. 2014;2(1):215-21.
9. Halder A. Community Based Study on Reproductive Tract Infection in a District of West Bengal – An Appraisal. *J Comprehensive Health*. 2014;2(1):49-56
10. Mamta, Kaur N. Reproductive Tract Infections: Prevalence and Health Seeking Behaviour among Women of Reproductive Age Group. *Int J of Sci Res*. 2014;3(4):138-42.
11. Philip S, Benjamin AI, Sengupta P. Prevalence of symptoms suggestive of reproductive tract infections/sexually transmitted infections in women in an urban area of Ludhiana. *Indian J Sex Transm Dis*. 2013;34:83-8.
12. Prabha M, Sasikala G, Bala S. Comparison of syndromic diagnosis of reproductive tract infections with laboratory diagnosis among rural married women in Medak district, Andhra Pradesh. *Indian J Sex Transm Dis*. 2012;33(2):112-5.
13. Balamurugan SS, Bendigeri ND. Community-Based Study of Reproductive Tract Infections Among Women of the Reproductive Age Group in the Urban Health Training Centre Area in Hubli, Karnataka. *Indian J Community Med*. 2012;37:34-8.
14. Samanta A, Ghosh S, Mukherjee S. Prevalence and health-seeking behavior of reproductive tract infection/ sexually transmitted infections symptomatics: A cross-sectional study of a rural community in the Hooghly district of West Bengal. *Indian J Public Health*. 2011;55:38-41.
15. Jindal N, Aggarwal A, Gill P, Sabharwal B, Sheevani BB. Community-based Study of Reproductive Tract Infections, Including Sexually Transmitted Infections, Among the Rural Population of Punjab, India *Indian J Community Med*. 2009;34(4):359-61.
16. Sharma S, Gupta BP. The Prevalence of Reproductive Tract Infections and Sexually Transmitted Diseases Among Married Women in the Reproductive Age Group in a Rural Area. *Indian J Community Med*. 2009;34:1.
17. Kosambia et al, RTI/STI prevalence among urban and rural women of Surat: A community-based study *Indian J Sex Transm Dis*. 2009;30(2):89-93.
18. Patnaik L, Sahu T, Sahani NC. Syndromic diagnosis of RTI/STI among women of reproductive age group. *Indian J Community Med*. 2008;4:1.
19. Patel V, Weiss HA, Kirkwood BR. The burden and determinants of reproductive tract infections in India: a population based study of women in Goa, India. *Sex Transm Infect*. 2006;82(3):243-9.
20. Rathore M, Swami SS, Gupta BL, Sen V, Vyas BL, Bhargav A, et al. Community-Based Study of Self Reported Morbidity of Reproductive Tract among Women of Reproductive Age in Rural Areas of Rajasthan. *Indian J Community Med*. 2003;28:117-21.
21. Devi, Swarnalatha. Prevalence of RTI/STI among reproductive age women (15-49 years) in urban slums of Tirupati town, Andhra Pradesh Health and Population- Perspectives Issues. 2007;30(1):56-70.
22. Prevalence of RTIs among Women in Shimla. *Indian J Community Med*. 2006;31:1.
23. Dasgupta A, Sarkar M. A study on reproductive tract infections among married women in the reproductive age group (15-45 years) in a slum of Kolkata, *J Obstet Gynecol India*. 2008;58(6):518-22.
24. Neelam S, Sohail I. Rapid Clinical Diagnostic Tests for Bacterial Vaginosis and its Predictive Value. *Int J Pathol*. 2010;8(2):50-2.
25. Callee JG, Fraser AG, Marmion BP, Simmons A. Mackie McCartney-Practical Medical Microbiology. Edited by Churchill and Livingston; 14th edition, 1996.
26. Cohrssen A, Anderson M, Merrill A, McKee D. Reliability of the whiff test in clinical practice. *J Am Board Fam Pract*. 2005;18:561-2.
27. Demba E, Morison L, Maartem Schim VDL. Bacterial vaginosis, vaginal flora patterns and vaginal hygiene practices in patients presenting with vaginal discharge syndrome in the Gambia, West Africa. *BMC Infect Dis*. 2005;5:12-24.

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