

## Original Research Article

# Evaluation of risk factors in women attending a sexually transmitted infection clinic at a tertiary care centre

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## ABSTRACT

**Background:** Reproductive tract infections (RTIs) continue to present major health, social and economic problems all over the world and their complications are the most important causes of morbidity and mortality for women especially in the developing countries. Interest in RTIs and their management has increased tremendously because presence of a RTI in the sexual partner increases the risk of acquisition of HIV. Aim was to evaluate the risk factors in women attending a sexually transmitted infection clinic at a tertiary care centre and prevalence of RTI in our setup.

**Methods:** The present study was conducted on 318 women of reproductive age group (18-45 years) attending the Reproductive tract infection/ sexually transmitted infection (RTI/STI) clinic at our tertiary care centre, they were evaluated for the prevalence of following RTIs: chlamydia, gonorrhoea, syphilis, bacterial vaginosis, trichomoniasis and candidiasis; and their correlation with clinical features and associated risk factors.

**Results:** The factors found to be significantly associated with RTI were illiteracy, unemployment, past history of RTI in patient and presence of RTI in their partner. The prevalence of RTI in our setup reported 9.7%. The prevalence of candidiasis was maximum (11.5%) followed by chlamydia (4.1%), syphilis (4.1%), bacterial vaginosis (1.73%) and trichomoniasis (0.57%).

**Conclusions:** None of the women was found positive for gonorrhoea. No coexistence of any two diseases found in any patient. Most common presentation was genital discharge (52.8%) followed by lower abdominal pain (45.2%).

**Keywords:** Bacterial vaginosis, Chlamydia, Gonorrhoea, RTI/STI, Trichomoniasis, Syphilis

## INTRODUCTION

Reproductive tract infections (RTIs) including sexually transmitted infections (STIs) continue to present major health, social and economic problems all over the world especially in the developing countries.<sup>1-6</sup>

The complications of these are most important causes of illness and death for women.<sup>7,8</sup> Failure to diagnose and

treat STI/RTI at an early stage in women of reproductive age group may result in serious complications and consequences, including pelvic inflammatory disease, infertility, foetal wastage, ectopic pregnancy, genital cancer and premature death, as well as neonatal and infant infections.<sup>9-11</sup>

Presence of a STI/RTI in the sexual partner increases the risk of acquisition of HIV.<sup>12,13</sup> Hence effective control of

STI/RTI is a strong and most cost effective strategy for preventing transmission of HIV also.

It is estimated that approximately 500 million people worldwide become ill each year with one of the 4 STIs: Chlamydia, gonorrhoeae, syphilis and trichomoniasis, 75-85% of which occur in developing countries. In India about 6% of the adult population suffers from STI/RTI.<sup>14</sup> There is a paucity of such studies from northern India in recent years. This study was conducted to estimate the current prevalence of reproductive tract infection and their associated risk factors.

## METHODS

Study was conducted in the post graduate department of microbiology and RTI/STI clinic at Queen Mary hospital associated with Gandhi Memorial and Associated Hospital, King George's Medical University, Lucknow. This was a hospital based prospective observational study. The duration of study was one year from August 2016 to July 2017. Sample consisted of 2 vaginal swabs (if vaginitis suspected), 2 cervical swabs (if cervicitis suspected), and 2 ml of venous blood (if syphilis suspected). For the diagnosis of gonorrhoea Gram staining and culture was done on chocolate agar (Biomérieux SA, France).<sup>15,16</sup> For *Chlamydia trachomatis* antigen detection by direct fluorescence assay test was performed by commercially available kit (Chlamydia T, bioscientifica S.A.) according to the manufacturer's guidelines (Figure 1).

For candidiasis KOH mount, Gram stain and culture on Sabouraud's dextrose agar (SDA) slopes were done and identification was done by Gram staining, saline wet mount and lactophenol cotton blue mount. Speciation of candida species was done by Germ tube test, morphological characteristics on corn meal agar and colour production on CHROM agar.<sup>17</sup> Trichomoniasis was diagnosed by morphology and motility on direct wet mount from swabs (Figure 2), bacterial vaginosis was diagnosed by saline wet mount, gram stain (Nugent's scoring), pH test and Whiff test.<sup>18</sup> Syphilis was diagnosed using venereal disease research laboratory (VDRL) test and Treponema pallidum haemagglutination assay (TPHA) by commercial kit IMMUTREP TPHA, Omega diagnostics.

## RESULTS

Prevalence of RTI was found to be 9.7% at our setup. Three hundred eighteen women of reproductive age group presenting with the complaints of reproductive tract infections were enrolled in the study from which 344 samples were received, out of 344 samples 74 were cervical (148 cervical swabs), 174 were vaginal (348 vaginal swabs) and 96 were venous blood samples. From 26 women both vaginal and cervical swabs were collected. Out of 74 women suspected with cervicitis 3 were diagnosed chlamydia positive, out of 174 women

suspected with vaginitis 24 were tested positive (Candida, bacterial vaginosis and trichomonas vaginalis) and out of 96 women suspected with syphilis only 4 were positive for syphilis. The prevalence of candidiasis was maximum (11.5%) followed by chlamydia (4.1%), syphilis (4.1%), bacterial vaginosis (1.73%) and trichomoniasis (0.57%). None of women was found positive for gonorrhoea. No coexistence of any two diseases found in any patient. Out of 20 cases of candidiasis, maximum i.e. 10 (50%) were *Candida glabrata*, 7 (35%) *Candida albicans* and 3 (15%) were *Candida tropicalis*.

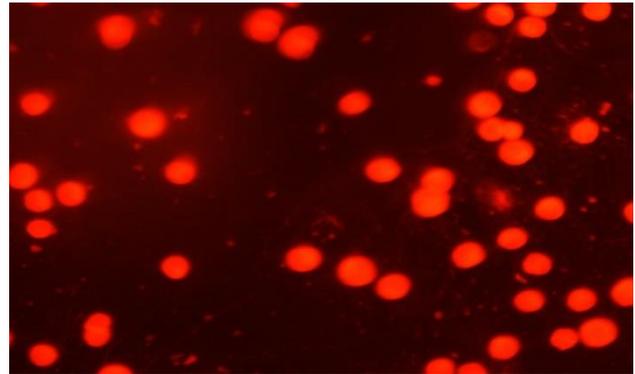


Figure 1: Elementary bodies of chlamydia (DFA).

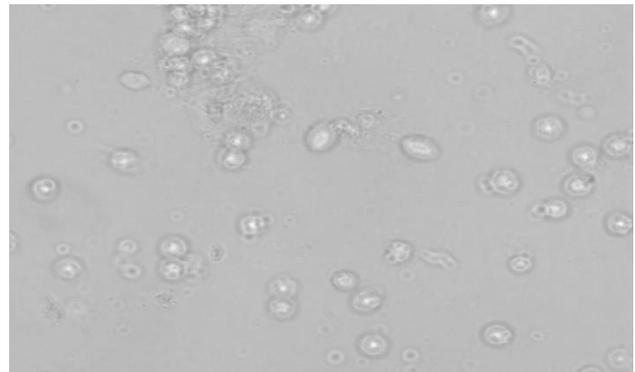


Figure 2: Trichomonas vaginalis on wet mount.

Most common presentation was genital discharge i.e. in 52.8% women followed by lower abdominal pain 45.2%, itching of genitalia 31.7%, burning micturation 27%, increase frequency of micturation 26.8 %, erythema of genitalia 24.2% and backache 22%. In maximum women the discharge was thick, curdy white in nature followed by thick, purulent, foul smelling discharge (Table 3).

Sexually transmitted infections were most common in the age group of 18-25 years. The factors found to be significantly associated with the prevalence of STI were illiteracy, occupation, past history of RTI and symptoms suggestive of RTI in partner (Table 1, Table 2). Other factors studied were social class according to the B.G Prasad's scale, area of living, religion, parity, history of abortion or premature birth, infertility, use of contraceptive method (Table 2). These factors were not found to be significantly associated.

**Table 1: Demographic major factors affecting the prevalence of reproductive tract infections.**

Factors	Total number of women	RTI positive number (%)	RTI negative number (%)	P value
Age groups (yrs)	18-25 (n=103)	16 (51.6)	87 (30.3)	P >0.05
	26-30 (n=109)	10 (32.3)	99 (34.4)	
	31-35 (n=59)	2 (6.5)	57 (19.8)	
	36-40 (n=23)	1 (3.2)	22 (7.7)	
	41-45 (n=24)	2 (6.5)	22 (7.7)	
Education	Illiterate (n=70)	23 (74.1)	47 (16.3)	P <0.05
	Primary school (n=139)	4 (12.9)	135 (47)	
	Secondary school (n=55)	2 (6.5)	53 (18.7)	
	Above secondary (n=54)	2 (6.5)	52 (18.1)	
Occupation	Daily wage worker (n=53)	14 (45.2)	39 (13.6)	P <0.05
	Housewife (n=192)	14 (45.2)	178 (62)	
	Student (n=19)	0 (0)	19 (6.6)	
	Small scale Business (n=41)	1 (3.2)	40 (13.9)	
	Salaried (n=13)	2 (6.5)	11 (3.8)	
Socio-economic status	B.G Prasad scale 1 (n=0)	0 (0)	0 (0)	P >0.05
	B.G Prasad scale 2 (n=18)	0 (0)	18 (6.3)	
	B.G Prasad scale 3 (n=62)	5 (16.1)	57 (19.9)	
	B.G Prasad scale 4 (n=163)	16 (51.6)	147 (51.2)	
	B.G Prasad scale 5 (n=75)	10 (32.2)	65 (22.6)	
Locality	Rural (n=79)	5 (16.1)	74 (25.8)	P >0.05
	Slum (n=165)	22 (71)	143 (49.8)	
	Urban (n=74)	4 (12.9)	70 (24.4)	

**Table 2: Factors affecting the prevalence of RTIs.**

Factors	Total number of women	RTI positive number (%)	RTI negative Number (%)	P value
Contraceptive method	barrier method (n=83)	9 (29.9)	74 (25.3)	P >0.05
	IUCD (n=48)	6 (19.4)	42 (14.6)	
	OCP (n=55)	4 (12.9)	51 (17.8)	
	permanent method (n=42)	1 (3.2)	41 (14.3)	
	NO method (n=89)	11 (35.5)	78 (27.2)	
H/O abortion	Present (n=109)	5 (16.1)	104 (36.2)	P >0.05
	Absent (n=209)	26 (83.9)	183 (63.8)	
Infertility	Present (n=26)	3 (9.7)	23 (8)	P >0.05
	Absent (n=292)	28 (90.3)	264 (92)	
Parity	Present (n=253)	22 (71)	231 (80.5)	P >0.05
	Absent (n=65)	9 (9)	56 (19.5)	
Past history of RTI in women	Present (n=75)	15 (48.4)	60 (20.9)	P <0.05
	Absent (n=2430)	16 (51.6)	227 (79.1)	
RTI in Partner	Present (n=57)	16 (51.6)	41 (14.3)	P <0.05
	Absent (n=261)	15 (48.4)	246 (85.7)	

## DISCUSSION

In the present study overall prevalence of RTI/STI in reproductive age group was slightly less to the prevalence found in earlier studies done by Jindal N et al, and Samanta A et al, who reported the prevalence to be 11.75% and 13.6%, respectively.<sup>19,20</sup> Ravi RP et al, found

the prevalence 14.5% among reproductive age group women.<sup>21</sup> Other study done by Majhi P et al, found higher prevalence 22.5% among adolescent girls in an urban slum of Sambalpur and 39.1% by Hegde KB et al, in a peri-urban under privileged area in Bangalore.<sup>21-23</sup> This could be attributed to differences in reporting and testing methods. In our setup, most of the women are reluctant to seek medical treatment because of lack of

privacy, lack of the female doctors at the health facility, the cost of treatment and their subordinate social status.

**Table 3: Types of vaginal discharge.**

Type of discharge	Number	%
Thick, curdy, white	52	31
Thick, purulent, foul smelling	21	12.5
Thick, mucopurulent	19	11.3
Thick, mucopurulent, foul smelling	19	11.3
Thin, profuse, creamy, foul smelling	14	8.3
Thick, purulent	13	7.7
Thin, profuse, creamy	13	7.7
Thick, curdy, foul smelling	5	3
Thick, mucopurulent, mixed with blood	5	3
Thin, pale, foul smelling	4	2.4
Thin, profuse, greenish	4	2.4

RTIs have an additional element of shame and humiliation for many women because they are considered unclean. Women also do not seek treatment for RTIs due to lack of awareness, asymptomatic nature of RTIs and limited treatment facilities also. Study done by Ray K et al, in Delhi found *Candida* infection (20.2%), bacterial vaginosis (4.1%), *Trichomonas vaginalis* (2.1%), Chlamydia (1.5%), syphilis (1.1%), gonorrhoea (0.7%), these findings are close to findings of our study.<sup>24</sup> Another similar study done by Balamuruganet SS al, reported that majority of women were positive for candidiasis (16.01%) followed by bacterial vaginosis (12.5%), trichomoniasis (4.27%), syphilis (1.52%), and gonorrhoea 0%.<sup>25</sup> Prevalence in different age groups was estimated and it was maximum (51.6%) in the age group 18-25 years, because this is the most sexually active group and at a higher risk of being behaviourally more vulnerable to STI acquisition, as they generally have a higher number of sexual partners and more concurrent partnerships than older age groups.

In a similar study previously done by Shethwala N et al, in Gujarat, found prevalence of RTI/STI 45.3% in females of less than 25 years of age which is similar to our study.<sup>26</sup> In our study, the prevalence of RTI/STI cases observed to be significantly higher (74.2%) in illiterate women ( $p < 0.05$ ). prevalence of STI/RTI decreases as education level increases, because educated women have good hygiene practice and use health care services much more than illiterate women. The similar results found in a studies done by Nayyaret C et al, in Delhi and Gayatri S et al, where the higher prevalence was found in illiterate group of women (32.2% and 39.6% respectively).<sup>27</sup>

Prevalence of RTI/STI is significantly higher ( $p < 0.05$ ) in daily wage workers (45.2%) and housewives (45.2%) as compared to who were salaried (6.5%) and doing small scale business (3.2%). In a study by Shethwala N et al, RTI/STI prevalence was 11.3% in women working outside home and 88.7% in housewives. In a similar study done by Hegdeet KB et al, in Bangalore found that

51% were housewives and 24% worked as housemaids. None of the student in our study were suffering from RTI/STIs. This may be due to rare exposure to sexual activity in students or more use of barrier contraceptive by them.

In the present study, 48.4% women had history of RTI/STI in past, so a significant association ( $p = 0.001$ ) was observed between RTI/STI and past history of such infection. Because once infected could give rise to repeated infections. This finding was similar to that reported by Kosambiya JK et al, who reported that 45% women having symptoms suggestive of RTI/STI in past.<sup>28</sup> Another study done by Nayyar C et al, found that people with a past history of STI had higher prevalence of STI as compared to people without a past history.<sup>14</sup> RTI/STI was significant ( $P < 0.05$ ) higher (51.6%) in women whose partner also had symptoms suggestive of RTI/STI. This proves that RTI/STI in partner is a major risk factor.

According to socio-economic class, 51.6% women belong to B.G Prasad scale 4 and 32.2% belonged to B.G Prasad scale 5 and remaining 16.1% belonged to B.G Prasad scale 3. None of the women belonged to B.G Prasad scale 1 and 2 had RTI/STI. But the difference in the socioeconomic status of women was not found to be statistically significant. Similar study done by Majhi P et al, found that 16.8% girls were from class III socioeconomic class, 45.3% girls were from class IV and 37.9% (153) girls were from class V which is similar to our study. This might be due to awareness and knowledge and hygiene.

RTI/STI was found to be more (71%) in women who were living in slum area than the women living in rural (16.1%) and urban (18.2%) area; this could be due to poor health seeking behaviour and low education of the slum women.

RTI/STI was maximum in women (35.5%) who were not using any contraceptive method this confirms the well-known fact that contraceptive methods like condoms have a protective role in the prevention of RTI/STI. Study done by Mani G et al, found that the prevalence of RTIs/STIs was lowest among those who used condoms, highest in those who used Copper T, followed by those who used none of these methods.<sup>29</sup>

Most common presentation was genital discharge i.e. in 52.8% women followed by lower abdominal pain (45.2%), itching of genitalia (31.7%), burning micturition (27%), increase frequency of (26.8%), erythema of genitalia (24.2%) and backache 22%. This parallels to the study done by Shethwala N et al, in Gujarat where commonest symptom of RTIs/STDs was vaginal discharge (98%) followed by lower abdominal pain (76%). According to Kamini B et al, vaginal discharge was commonest symptom and found in 69% study population which is similar to our study. According

to Balamuruganet SS et al, found majority of women i.e. 32.7% complained of abnormal vaginal discharge followed by lower backache in 31.4% and lower abdominal pain in 23.5% women.

## CONCLUSION

The factors found to be significantly associated with STI were illiteracy ( $p < 0.05$ ), unemployment ( $p < 0.05$ ), past history of RTI and presence of RTI in their partner ( $p < 0.05$ ). Most commonly affected age group was 18-25 years. Other associated factors were low social class, living in slum area, infertility, not using any contraceptive method. Most common presentation was genital discharge followed by lower abdominal pain, itching of genitalia, burning micturation, increase frequency of micturation, erythema of genitalia and backache. In maximum women the discharge was thick, curdy white in nature followed by thick, purulent, foul smelling discharge. The prevalence of RTI in our setup reported 9.7%.

There is a need to educate women about the symptoms of RTI/STI, their prevention, and the importance of timely diagnosis and treatment. Observation of current study reinforce the importance of screening for sexually transmitted diseases as a necessary intervention to decrease the burden of sexually transmitted diseases because early detection and treatment of STDs can decrease the HIV transmission and will prevent complications.

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