Original Article

# Community-Based Study of Reproductive Tract Infections Among Women of the Reproductive Age Group in the Urban Health Training Centre Area in Hubli, Karnataka

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## ABSTRACT

**Background:** Reproductive tract infections (RTIs) is a global health problem including both sexually transmitted infections (STIs) and non-sexually transmitted infections (non-STIs) of the reproductive tract. RTI/STI is an important concern, as it possess risk for human immunodeficiency virus transmission. Hence a community study was done in Hubli, in terms of active search of the cases based on the symptoms, clinical examination, and feasible laboratory tests along with providing treatment, counseling, and follow-up. **Objectives:** The objective was to know the prevalence of RTIs among the reproductive age group women and the socio-demographic factors influencing the occurrence of the disease. **Materials and Methods:** A cross-sectional study was done using a simple random sampling technique to select households. A pretested structured pro forma was used to collect data on RTIs from 656 women of 15–45 years, residing in the field practice area. This was followed by clinical examination and collection of samples for laboratory tests in Urban Health Training Centre, attached to Karnataka Institute of Medical Sciences, Hubli. **Results:** The prevalence of RTIs among the reproductive age group women was 40.4% based on their symptoms, with majority having abnormal vaginal discharge. The prevalence of RTIs based on clinical finding was 37.4% with majority having vaginitis. The laboratory test revealed a prevalence of 34.3% with majority having Candidiasis. The influence of socio-demographic factors like increased parity, poor socio-economic conditions, poor menstrual hygiene, illiteracy has its direct effect on occurrence of RTI in the community. **Conclusion:** This depicts that whereever possible, clinical and laboratory findings should support self-reported morbidity to know the exact prevalence of any disease in the community.

**Keywords:** Clinical findings, laboratory tests, reproductive tract infections, symptoms

## Introduction

Reproductive tract infections (RTIs), including both sexually transmitted infections (STIs) and non-sexually transmitted infections (non-STIs) of the reproductive tract are responsible for major ill-health throughout the world.[1] World Health Organization estimates that each year there are over 340 million new cases of sexually transmitted infections in which 75–85% occur in developing countries. In India alone, 40 million new cases emerge each year.[2] A majority of women continue to suffer from RTIs leading to complications like pelvic inflammatory disease (PID), infertility, cervical cancer, postabortal, and puerperal sepsis, chronic pelvic pain, and ectopic pregnancy. RTIs in many cases are asymptomatic among women, making their detection and diagnosis difficult.[3] An effort has been made in this regard to detect RTI cases among the women in the field practice area of Urban Health Training Centre (UHTC), Hubli, Karnataka.

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## Materials and Methods

The objective of the study was to know the prevalence of RTIs among the reproductive age group women and the socio-demographic factors influencing the occurrence of the disease.

This study was undertaken in the field practice area of UHTC, Hubli, and reproductive age group women of 15–45 years were identified for the study purpose.

It is a cross-sectional time bound study, conducted from September 2003 to August 2004.

The sample size 656 was calculated by taking into consideration 19% of women under 15–45 years in urban community, at 95% confidence interval and 3% permissible error covering ±1.96 under normal curve.

All houses in the field practice area were numbered by using a random numbering table. Houses were selected on the basis of a simple random sampling technique until 656 women of the reproductive age group were covered in 520 families.

A pretested structured pro forma was used to interview the women about their socio-demographic, reproductive history, current, and past RTI symptoms.

The syndromes related to RTI as recommended by Government of India, Ministry of Health and Family Welfare, for management of RTIs/STDs were considered. All 656 women were given referral slips and encouraged after counseling to attend for clinical examination and laboratory tests in UHTC.

In the center, per speculum examination was done, and vaginal and endocervical swabs were taken. In unmarried women, the discharge was collected using a gloved finger after their consent. Women with menstrual bleeding and women in their postpuerperal period at the time of clinical examination were asked to come for gynecological examination after cessation of menstrual bleeding or lochia.

Blood sample for a serological test to diagnose Syphilis was taken from every respondent after written consent and counseling.

Wet mount microscopy of vaginal secretions was done to detect *Trichomonas vaginalis*. Immediately after per speculum examination, the vaginal and endocervical swabs were sent to Microbiology Department, Karnataka Institute of Medical Sciences (KIMS), in a cold box, Gram stained, and inoculated in suitable media like chocolate agar and Thayer Martin medium for Gonorrhea and Sabouraud dextrose agar (SDA) media for Candidiasis.

For diagnosis of bacterial vaginosis (BV) any three out of four criteria were taken as positive:[4]

1. Watery vaginal discharge.
2. Vaginal pH more than 4.5 using pH indicator paper.
3. Amine odour test positive (odour described as fishy after addition of 10% KOH).
4. Clue cells in Gram's stained vaginal smear under microscopy.

### Analysis

Statistical tests like proportions, Z-test, and Chi-square test were used.

Data were tabulated on Microsoft excel sheets and analyzed using software Epi info version 6.

## Results

The present study revealed that 265 women were found to be suffering from RTI based on their symptoms, giving a prevalence of 40.4% [Table 1].

Table 1 shows that a majority of women, 215 (32.7%), complained of abnormal vaginal discharge followed by lower backache in 206 (31.4%) and lower abdominal pain in 154 (23.5%) women (*n*=656).

**Table 1: Distribution of women according to RTI symptoms**

| RTI symptoms | No. of women | Percentage (*n*=656) |
|---|---|---|
| Abnormal excessive vaginal discharge | 215 | 32.77 |
| Lower back ache | 206 | 31.40 |
| Lower abdominal pain | 154 | 23.48 |
| Associated fever | 92 | 14.02 |
| Genital ulceration | 3 | 0.46 |
| Vulval itching or burning | 95 | 14.48 |
| Painful coitus | 76 | 11.59 |
| Dysmenorrhea | 62 | 9.45 |
| Menstrual disturbances | 103 | 15.70 |

RTI: Reproductive tract infection

**Table 2: Distribution of women according to the clinical findings of RTI**

| Clinical findings of RTI | No. of women | Percentage (*n*=656) |
|---|---|---|
| Vaginitis | 242 | 36.9 |
| Vulvitis | 93 | 14.18 |
| Cervicitis | 122 | 18.6 |
| Pelvic inflammatory disease | 205 | 31.25 |
| Genital ulcer | 1 | 0.15 |
| Inguinal bubo | – | – |
| Tenderness in fornix | 137 | 20.88 |
| Abdominal tenderness | 86 | 13.11 |
| Uterine prolapse | 1 | 0.15 |

RTI: Reproductive tract infection

Table 2 shows on clinical examination that 245 (37.35%) women had significant clinical findings suggestive of RTI in which 242 (36.9%) women had vaginitis, followed by PID in 205 (31.25%) women ($n$=656).

Out of 656 women taken for the sample study, 265 women had symptoms of RTI and 391 women had no symptoms of RTI. Among symptomatics, 192 (72.4%) women ($n$=265) had positive clinical signs and among asymptomatics, 53 women (13.5%) ($n$=391) had signs of RTI on clinical examination with majority of women having vaginitis, cervicitis, and tenderness in the fornix.

Based on laboratory findings, 225 women were positive for RTI giving a prevalence of 34.3% in which a majority of women were positive for Candidiasis 105 (16.01%) followed by Bacterial vaginosis 82 (12.5%), Trichomoniasis 28 (4.27%), Syphilis 10 (1.52%), and Gonorrhea 0% [Table 3].

A total of 4.12% women had mixed infections with Candidiasis, Bacterial vaginosis, and Gram-negative organisms ($n$=656) [Table 3].

Out of 265 symptomatic women, 192 women had positive clinical signs in which 178 women (92.7%) ($n$=192) had positive laboratory tests, with majority having Candidiasis.

Out of 391 asymptomatic women, 53 women had positive clinical signs and 338 women with no clinical signs of RTI, in which 22 women (6.5%) ($n$=338) had a positive laboratory test with 18 women being positive for Candidiasis by culture, and 4 women being positive for the Venereal Disease Research Laboratory (VDRL) test for Syphilis.

Table 4 shows the trend of clinical findings of RTI in relation to age with maximum prevalence between 20 and 29 years age group. The mean age of women in whom RTI was present is 26.03 years. SD (±7.61 years).

It was found that the number of women 50% among Muslims had RTI compared to other religion ($P$<0.001) [Table 4].

**Table 3: Distribution of women according to laboratory investigations of RTI**

| Laboratory tests for RTI | No. of women | Percentage ($n$=656) |
|---|---|---|
| Gonorrhea | 0 | 0 |
| Syphilis | 10 | 1.52 |
| Trichomoniasis | 28 | 4.27 |
| Bacterial vaginosis | 82 | 12.50 |
| Candidiasis | 105 | 16.01 |
| Mixed infections | 27 | 4.12 |

RTI: Reproductive tract infection

**Table 4: Socio-demographic profile of the women in the reproductive age group of 15-45 years with RTI signs**

| | No. of participants ($n$=656) | No. of women with signs of RTI ($n$=245) | Percentage | Level of significance |
|---|---|---|---|---|
| Age group | | | | |
| 15–19 | 95 | 33 | 34.74 | $Z$=3.38 |
| 20–24 | 142 | 52 | 36.62 | $P$<0.05 |
| 25–29 | 192 | 97 | 50.52 | |
| 30–34 | 80 | 26 | 32.50 | |
| 35–39 | 61 | 13 | 21.31 | |
| 40–45 | 86 | 24 | 27.91 | |
| Religion | | | | |
| Hindu | 465 | 154 | 33 | $\chi^2$=15.57 |
| Muslim | 163 | 82 | 50 | $P$<0.001 |
| Others/ Christian | 28 | 9 | 32 | |
| Marital status | | | | |
| Unmarried | 98 | 11 | 11 | $\chi^2$=41.339 |
| Married | 526 | 228 | 43 | $P$<0.001 |
| Separated/ divorced | 32 | 6 | 6 | |
| Duration of marital life | | | | |
| <1 year | 105 | 32 | 30.4 | $\chi^2$=11.283 |
| 1–5 years | 274 | 120 | 43.8 | $P$<0.05 |
| >5 years | 147 | 76 | 51.7 | |
| Educational status | | | | |
| Illiterate | 318 | 148 | 46.5 | $\chi^2$=22.72 |
| Primary | 203 | 61 | 30 | $P$<0.001 |
| Secondary | 74 | 20 | 27 | |
| S.S.L.C. | 43 | 11 | 26.5 | |
| Degree | 18 | 5 | 25 | |
| Occupation | | | | |
| Home maker | 594 | 231 | 38 | $\chi^2$=7.106 |
| Employed | 42 | 11 | 26 | $P$<0.05 |
| Students | 20 | 3 | 15 | |
| Socioeconomic class | | | | |
| I | 14 | 2 | 14 | $\chi^2$=36.101 |
| II | 45 | 10 | 22 | $P$<0.001 |
| III | 66 | 88 | 33 | |
| IV | 302 | 121 | 40 | |
| V | 29 | 24 | 82 | |
| Menstrual history | | | | |
| Sanitary pads | 26 | 4 | 15 | $\chi^2$=6.5 |
| Clothes | 600 | 232 | 38 | $P$<0.05 |
| Sanitary pads and clothes | 30 | 9 | 30 | |
| Parity | | | | |
| None | 64 | 18 | 28 | $\chi^2$=16.56 |
| 1-2 | 150 | 50 | 33 | $P$<0.001 |
| 3-5 | 282 | 132 | 46 | |
| >5 | 62 | 34 | 54 | |
| Family planning methods | | | | |

(*Contd...*)

**Table 4: (*Contd*)**

| | No. of participants (*n*=656) | No. of women with signs of RTI (*n*=245) | Percentage | Level of significance |
|---|---|---|---|---|
| Barrier methods | 19 | 6 | 31 | $\chi^2$=20.9 *P*<0.001 |
| IUCD | 65 | 55 | 84 | |
| OCP | 26 | 18 | 69 | |
| Tubectomy | 114 | 82 | 71 | |
| Pregnancy status | | | | |
| Yes | 78 | 40 | 51 | *Z*=2.64 |
| No | 578 | 205 | 35 | *P*<0.05 |

RTI: Reproductive tract infection, IUCD: Intra uterine contraceptive device, OCP: Oral contraceptive pills

Married women (43%) had more RTI compared to unmarried and divorced/separated women (*P*<0.001); similarly the prevalence of RTI increased with relation to married life from <1 year (30.4%) to >5 years (51.75%) [Table 4].

The prevalence of RTI was common among illiterate women (46.5%) and showed a decreased trend with an increase in level of education (*P*<0.001) [Table 4].

It was found that 38% of women who were home makers had RTI against 26% of employed women and 15% of students [Table 4].

The RTI prevalence showed an increasing trend with the decrease in socioeconomic class where 82% of women belonging to the class V or lower socioeconomic group had RTI (*P*<0.001) [Table 4].

It was found that 38% of women who used clothes during menstruation had RTI against 15% of those who used sanitary pads [Table 4].

The prevalence of RTI was 33% in women having children more than one and it increased with increase in parity (*P*<0.001) [Table 4].

Only 34% of women were using family planning methods and among them, the occurrence of RTI was 84% in the women using Intra uterine contraceptive device (IUCD) (*P*<0.001) [Table 4].

It was found that the prevalence of RTI among pregnant women was 51% (*P*<0.05) [Table 4].

## Discussion and Conclusion

From this study, the prevalence of RTI was 34.3% based on the laboratory findings against 40.4% based on only the symptoms.

It was observed that a majority of women, 215 (32.77%), complained of abnormal excessive vaginal discharge followed by lower backache 206 (31.4%) and lower abdominal pain 154 (23.48%). This study is in accordance with Nandan *et al*. where a majority of women, 53.4%, complained of abnormal vaginal discharge.[5]

Our study showed that a majority of women, 242 (36.9%), had vaginitis on examination followed by PID in 205 women (31.25%) which is in accordance with the observation of Garg *et al*. and Singh *et al*. where a majority of women on clinical examination had vaginitis of 94.6% and 52.1%, respectively.[6,7]

This study is in accordance with the observations made by Parikh *et al*. and Ranchan *et al*., where the prevalence of RTI on laboratory findings was 17% and 26.3%, respectively, with majority of women having Candidiasis.[8,9]

This study is also in accordance with Prasad *et al*. where prevalence of Syphilis was 1.5% and to Garg *et al*., where the prevalence of *Trichomonas vaginalis* was 4.3%.[10,6]

In this study maximum prevalence of RTI was found in the reproductive age group women of 20–29 years, which differs from the study of Rathore *et al*., where mean age of women with RTI was 33.59 years.[11] It was found in the study that marital status and RTI are related to each other, as married women who are leading active sexual life are having more chance of getting RTI.[12]Also with increased duration of married life, the risk of occurrence of RTI is more, due to enhanced sexual activity.[10]

The trend of increased RTI with decreased educational status of women shows that illiterate women were more ignorant about the occurrence of RTI with poor genital and menstrual hygiene and their health seeking behavior is also low.[11]

In our study, the RTI occurrence in unmarried women and students was mainly due to poor genital and menstrual hygiene. Similarly, poor socioeconomic class contributes to increased occurrence of RTI due to ignorance and economic backwardness.[13]

Women who used clothes during the menstrual period had increased risk of RTI due to lack of genital and menstrual hygiene which facilitated growth of endogenous infections.[7,8]

It was found in the study that there is association between parity of women and occurrence of RTI which is statistically significant. Women with more number of children are exposed to increased number of deliveries, contraceptive device, and gynecological

surgeries which contributes to occurrence of RTI in women.[12]

This study is in accordance with Rathore *et al*., where 2.4% among nulliparous women had RTI compared to 13% among primigravida and 28.5% among multigravida.[11]

It was observed that 84% of women among IUCD users had RTI. This is in accordance with observation of Prasad *et al*., where maximum 67% women among IUCD users had RTI. IUCD users are at more risk of acquiring RTI as they are exposed to iatrogenic and exogenous infections.[10]

It was found that 51% among pregnant women had RTI. It is due to hormonal change, they are prone for endogenous infections like Candidiasis and mixed infections.[14] This is in accordance with Maitra *et al*., where 1 out of 4 pregnant women had RTI, with abnormal vaginal discharge being common symptom followed by pain during urination.[13]

Hence the study highlights the need for community-based studies requiring laboratory investigations with feasible tests to know the exact prevalence of the disease, as the self-reported morbidity alone cannot measure the burden of any disease in the community to necessitate proper prevention and control measures.

This study will serve as a reference for researchers interested in the field of RTI/STI epidemiology, who may in future take up similar studies to compare and highlight the performance of Reproductive and child health programme (RCH) over the years in combating this disease.

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