

## PREVALENCE AND RISK FACTORS OF REPRODUCTIVE TRACT INFECTIONS/SEXUALLY TRANSMITTED INFECTIONS IN URBAN SLUMS OF TIRUPATI – A COMMUNITY BASED CROSS-SECTIONAL STUDY

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Received : 05/06/2023  
Received in revised form : 02/07/2023  
Accepted : 13/07/2023

**Keywords:**

Reproductive tract infections, sexually transmitted infections, urban slum, abnormal vaginal discharge, menstrual hygiene.

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DOI: 10.47009/jamp.2023.5.4.136

Source of Support: Nil,  
Conflict of Interest: None declared

*Int J Acad Med Pharm*  
2023; 5 (4); 685-690



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### Abstract

**Background:** Sexually transmitted infections (STIs) / Reproductive tract infections (RTIs) constitute a huge health and economic burden for developing countries. This importance has been widely recognized since the advent of the HIV/AIDS epidemic. Cultural barriers as well as poor understanding of the significance of symptoms may also reduce care-seeking by women. **Objectives:** 1.To determine the prevalence of RTI/STI among reproductive age women in urban slums of Tirupati. 2. To list out socio-demographic factors and other risk factors associated with RTI/ STI. **Materials and Methods:** This community based cross-sectional study was conducted among 760 women aged 15-49 years in urban slums of Tirupati, from October 2016 to November 2017. Study subjects were selected based on systematic random sampling and interviewed using predesigned questionnaire. Study variables include socio-demographic data, menstrual and obstetric risk factors, symptoms of RTI like abnormal vaginal discharge, lower abdominal pain, genital ulcer, inguinal swelling, dyspareunia and burning micturition. Those with symptoms were counseled and referred to government maternity hospital for further management. **Results:** Out of 760 subjects, symptoms of RTI/STI were reported by 239 (31.45%), most common symptom being lower abdominal pain (137), followed by abnormal vaginal discharge (93). Most of them reported multiple symptoms. Socio-demographic factors like Age, Education, marital status, socio-economic status have statistically significant association with RTI. Prevalence of infection was high among married (36.11%), followed by widowed (9.62%) and un-married (5.63%) and this difference was statistically significant ( $p < 0.001$ ). Other risk factors like lack of menstrual hygiene, multiple births, abortions, IUCD usage, past history of infection and partner history were found to be significantly associated with RTI. **Conclusion:** Nearly one third of the study subjects had symptoms of RTI. Improving the menstrual and personal hygiene will decrease the risk of infection. Simultaneous and appropriate treatment of the partner prevents recurrence of infection.

## INTRODUCTION

Reproductive tract infections (RTI) are a group of infectious diseases caused by bacteria, viruses, Chlamydia, Mycoplasma and other pathogens invading the genital tract. Women in the reproductive age group are at risk of RTI/STI during natural events in their life such as menstruation, pregnancy and childbirth mostly due to the inherent

physiology of female reproductive tract.<sup>[1]</sup> RTIs can lead to complications such as infertility, intrauterine growth retardation, premature labour, and increased vulnerability to HIV/AIDS, and may cause a heavy social and economic burden to the families.<sup>[2]</sup>

According to the World Health Organization (WHO) 2016 fact sheet more than 1 million STIs are acquired every day. Each year, there are estimated 357 million new infections with 1 of 4 STIs:

chlamydia (131 million), gonorrhoea (78 million), syphilis (5.6 million) and trichomoniasis (143 million).<sup>[3]</sup>

In community studies syndromic diagnosis based on self-reported symptoms is useful. While clinical diagnosis is based on identifying the specific causative agent, syndromic diagnosis leads to immediate treatment for most important causative agents in settings with limited or no laboratory facilities. This is important because mixed infections occur frequently in STI/RTI.<sup>[4]</sup>

RTI/STI as a community health problem needs exploration in different strata to understand the extent and pattern of the disorder. Though they are important, only few community-based studies have been conducted in Andhra Pradesh especially in slums. So an attempt was carried out to study the prevalence and risk factors of RTIs/STIs among the reproductive age women in urban slums of Tirupati.

#### **Objectives**

1. To determine the prevalence of RTI/STI among reproductive age women in urban slums of Tirupati.
2. To enlist socio-demographic and other risk factors associated with RTI/STI.

## **MATERIALS AND METHODS**

A community based cross-sectional study was conducted in Urban slums of Tirupati, Andhra Pradesh from October 2016 to November 2017. Study subjects includes women of reproductive age group (15-49) years residing in urban slums of Tirupati for a period of minimum 6 months.

Sample size was calculated, by taking the prevalence of 39.1% (5) at 95% confidence interval with an allowable error 10% of the prevalence. By adding 15% non-response rate final sample size is rounded to 760. Systematic random sampling was used to achieve desired sample.

#### **Inclusion Criteria**

All the reproductive age women (15-49) years who were residing in that area for a period of minimum 6 months and who were willing to give the consent.

#### **Exclusion Criteria**

- a. Women who are non-cooperative and who were not willing to give the consent.
- b. All the antenatal women and postnatal women in puerperium.
- c. Who are severely ill and bedridden.

#### **Study Method**

The present study was conducted after taking approval from Institutional Ethical committee SV medical college, Tirupati. There are 38 notified slums in urban area, according to data obtained from Municipal health office records. Total households were 14,153 and total population was 74,534 (2011 census).

Sample of 760 was divided among 38 slums (760/38=20), So it was decided to include 20

households in each slum. Selection of households from each slum was done by systematic random sampling after calculating the sample interval. From the selected household one study subject was included in the study. If there were more than one eligible member in a household then one among them was selected by lottery method. A pilot study was conducted in the month of October 2016 to access the feasibility of the study and to test the pre-designed questionnaire and necessary corrections were made.

Ethical certificate from the institutional ethical committee was obtained in the month of October 2016. Informed and written consent was taken from the study subjects after explaining the purpose and nature of the study in their own language. The participants were interviewed privately using a pre-tested questionnaire and confidentiality was maintained throughout the study.

#### **Pre-tested questionnaire consists of**

- a. Information regarding socio-demographic data, menstrual history, obstetric history, abortion history, intra-uterine contraceptive device usage, past history of infection and partner history was obtained.
- b. History of symptoms of RTIs/STIs like abnormal vaginal discharge, lower abdominal pain, genital ulcer, inguinal swelling, dyspareunia and burning micturition for past 6 months were obtained.

#### **Definitions utilized for variables**

Reproductive tract infections (RTIs): Reproductive Tract Infections refer to any infection of the reproductive or genital tract irrespective of whether it is sexually transmitted or not e.g bacterial vaginosis, Chlamydia trachomatis, Neisseria gonorrhoea, Hepatitis B, HIV/AIDS, HSV2, Trichomonas vaginalis.<sup>[6]</sup>

Sexually transmitted infections (STIs): The RTIs which are transmitted through sexual contact are called as sexually transmitted infections.<sup>[6]</sup>

Diagnostic criteria for RTI/STI - Presence of any one of the symptoms of RTI/STI like abnormal vaginal discharge (which look and smell differently from the usual discharge), lower abdominal pain not related to menstruation, genital ulcer, inguinal swelling was considered as having infection which was based on WHO syndromic approach.<sup>[7]</sup>

#### **Statistical Analysis**

The data was analyzed with MS Excel and Epi info 7.1.20 version software and Proportions were used for variables like age, occupation, type of family, social class, marital status, menstrual risk factors, and obstetric risk factors etc. The prevalence rate is defined as number of subjects with symptoms of RTI/STI divided by number of subjects covered, multiplied by 100. For finding association of RTI/STI with the risk factors, Pearson's chi-square test was used. The statistical significance was evaluated at 95% level of confidence intervals.

## RESULTS

Prevalence of infection: The present study was conducted among 760 study subjects, out of which symptoms of RTI/STI were reported by 239 women, the prevalence of infection was 31.45%. Among them 137 (57.32%) reported lower abdominal pain, followed by Abnormal vaginal discharge 93 (50.63%), Burning micturition 69 (28.87%), Genital ulcer 3 (1.26%) and Inguinal swelling 2 (0.84%). Most of them reported multiple symptoms.

**Table 1: Showing distribution of women with symptoms of RTI**

Symptoms of Infection	Frequency(n)	Percent (%)
Lower Abdominal Pain	137	57.32
Abnormal Vaginal Discharge	121	50.63
Burning Micturition	69	28.87
Genital Ulcer	3	1.26
Inguinal Swelling	2	0.84

(Total is not equal to 239 due to multiple responses)\*

1. Socio-demographic factors: In the present study majority of the women were in the age group 25-29 years, prevalence of infection was high (42.19%) among 35-39 years, followed by 20-24 years (35.85%) and least (3.70%) among 45-49 years, this difference was statistically significant ( $p=0.001$ ). Prevalence of infection was highest (39.40%) among unemployed, followed by unskilled (19.78%), semi-skilled (8.00%) and this difference was statistically significant ( $p<0.001$ ). Prevalence of infection was high (36.11%) among married followed by widowed (9.62%) and un-married (5.63%) and this difference was statistically significant ( $p<0.001$ ). Majority of the study subjects belongs to nuclear families (66.97%) followed by joint families. The prevalence of infection was high among the women belonging to joint families (43.08%) ( $p=0.005$ ). Prevalence of infection was high (44.83%) among lower middle class, followed by upper middle class (42.06%) and middle class (25.39%) using modified BG Prasad classification and this difference was statistically significant.
2. Menstrual and obstetric risk factors menstrual and obstetric risk factors associated with RTI are given in the Table-2

**Table 2: Distribution of women with symptoms of RTI with menstrual and obstetric risk factors**

Absorbent Type	Present n (%)	P value
Sanitary Napkins	55 (15.03)	$\chi^2=88.30$ df=1 $p<0.001$ S
Homemade clothes	184 (46.70)	
Total	239 (31.45)	
Reuse of absorbent		$\chi^2=91.28$ df=1 $p<0.001$ S
Yes	172(48.73)	
No	67 (16.46)	
Total	239 (31.45)	
Washing of absorbent before reuse		$\chi^2=4.82$ df=1 $p=0.02$ S
Only Soap	147 (51.58)	
Disinfectant	25 (36.76)	
Total	172(48.73)	
Age at First Conception		$\chi^2=28.91$ df=1 $p<0.001$ S
≤18 Years	62 (51.67)	
>18 Years	134 (26.38)	
Total	196 (31.21)	
Contraceptive Usage		$\chi^2=0.74$ df=1 $p=0.386$ NS
Yes	169(35.14)	
No	66(31.73)	
Total	235(34.11)	
IUCD insertion		$\chi^2=28.95$ df=1 $p<0.001$ S
IUCD	105 (47.95)	
Others	64 (24.43)	
Total	169 (35.14)	
Abortion history		$\chi^2=96.02$ df=1 $p<0.001$ S
Present	68 (81.93)	
Absent	167 (27.56)	
Total	235 (34.11)	

3. Past history of similar complaints

Prevalence of infection was highest (98.39%) among women with past history of infection and this was statistically significant ( $p<0.001$ )

4. Partner history

Prevalence of infection was highest (94.83%) among women with similar complaints in the partner and this difference was statistically significant. ( $p < 0.001$ ).

## DISCUSSION

**Prevalence of infection:** In the present study prevalence of self-reported symptoms of RTI was 31.45%, where lower abdominal pain and abnormal vaginal discharge are common symptoms followed by burning micturition and genital ulcer. Only 2 women reported inguinal swelling. This is in accordance with a study conducted in rural areas of Tamil Nadu (2014) where prevalence is 33.3%, Abnormal vaginal discharge was the commonest symptom reported (23.7%) followed by painful urination (5.4%).<sup>[1]</sup> Another study conducted by Anitha et al (2016) among 200 women showed the prevalence of RTI (45.5%) (8). A study done by GK et al (2015) in underprivileged areas of Bangalore reported that 29.15% had symptoms of RTI.<sup>[9]</sup> A recent study done by Mitasa Singh et al (2022) in urban slums of North Delhi reported that 46.3% of women had symptoms of RTI.<sup>[20]</sup>

### Socio-demographic factors

In the present study most of the women comes under 25-29 years age group (25.26%). Prevalence of infection was more among 35-39 years (42.19%), followed by 20-24 years (35.85%) and 45-49 years (3.70%), this difference was statistically significant ( $p = 0.001$ ). Similar findings were reported in a study conducted at Bangalore slums where most of the study subjects belong to 26-35 years.<sup>[9]</sup> Another study done by Revathi et al, in rural area of Raichur (2015) where out of 380 reproductive age women, the prevalence of infection was highest i.e. 79.30% among >35 years old women and this difference were statistically significant.<sup>[10]</sup> This age group women are more prone to infection as they are completely involved in child care and neglect their own health.

Majority of the study subjects in the current study were unemployed 467(61.44%). Prevalence of infection was high among unemployed (39.40%) which includes house wives followed by unskilled workers (19.78%) and semiskilled workers (8.00%) and this difference was statistically significant ( $p < 0.001$ ). Similar findings were reported by Aparajitha D et al in Kolkata slums where the prevalence of RTI was more among the non-working women which includes house wives than the working women (72.53% vs. 21%).<sup>[12]</sup> which was consistent to the present study and reason might be due to the fact that most of the house wives neglect their health.

In the present study most of the study subjects (66.84%) belong to middle class. The prevalence of infection was highest among lower middle class (44.83%), when compared to middle class (25.39%) and this difference was statistically significant ( $p < 0.001$ ). Similar results were reported by Devi et

al where higher prevalence (61.9%) of RTI/STI was found in less income groups ( $p < 0.000$ ).<sup>[13]</sup>

In the present study most of them were married (83.82%) followed by unmarried (9.34%) and widower (6.84%). The prevalence of infection was more among married (36.11%) and difference was found to be statistically significant ( $p < 0.001$ ). Similar findings were reported by Rathore M et al. in rural area of Rajasthan where most of the study subjects were married (78.07%), followed by unmarried (20.79%), widow/divorced (1.15%) and the prevalence of infection was more among married (27.9%) and this difference was statistically significant ( $p < 0.001$ ).<sup>[14]</sup> This was in accordance with study done by Balamurugan SS et al.<sup>[15]</sup> and Sharma et al.<sup>[16]</sup>

**Menstrual hygiene-**In the present study prevalence of infection was highest among women who use clothes as absorbent (46.70%) during menstruation when compared to sanitary napkins (15.03%) and this difference was found to be statistically significant ( $p < 0.001$ ). Consistent findings were reported in a study conducted at Tamil Nadu.<sup>[1]</sup> and urban slum of North-East Delhi.<sup>[17]</sup> In the present study reuse of absorbent was reported by 353 subjects, among them 48.73% had infection which was statistically significant ( $p < 0.001$ ). Similar findings were reported by Shingade PP et al.<sup>[18]</sup> and Mani G et al.<sup>[1]</sup>, where reuse of absorbent increases the infection. The prevalence of infection was highest among subjects who use ordinary soap for washing of absorbent (51.58%) compared to disinfectant (36.76%) and this difference was statistically significant ( $p = 0.028$ ). Similar findings were reported in slums of Mumbai.<sup>[18]</sup> and Kancheepuram district of Tamil Nadu.<sup>[1]</sup>

**Obstetric risk factors:** In the present study prevalence of symptoms was highest (51.67%) among women with age of first conception  $\leq 18$  years when compared to >18 years and this difference was statistically significant ( $p < 0.001$ ). Similar findings were reported in a study conducted at Rupandehi district of Nepal where prevalence of infection was highest (46.4%) among women with first age of conception <20 years ( $p = 0.004$ ).<sup>[11]</sup> This might be due to the fact that early conception, child birth, and invasive procedures increase exposure to RTI.

In the present study women using contraceptives were divided in to IUCD users and other types, prevalence of infection was highest among IUCD users and others (47.95% vs 24.43%) and this difference was statistically significant ( $p < 0.001$ ). A study conducted by Mani G et al in Tamil Nadu.<sup>[1]</sup> showed significant association between Copper T insertion and prevalence of RTI ( $p = 0.000$ ). Similar to this, studies conducted in Rajasthan.<sup>[14]</sup> and Raichur.<sup>[10]</sup> reported a significant association between IUCD usage and prevalence of RTI

( $p < 0.05$ ). Improper hygiene practices related to IUCD insertion and maintenance may contribute to infection.

In the present study prevalence of infection was highest (81.93%) among the women with abortion history and this difference was statistically significant ( $p < 0.001$ ). Consistent findings were reported by Dasgupta Aparajita et al in an urban slum of Kolkata.<sup>[12]</sup>

Past history and partner history: In the present study, past history of infection was reported by 124 study subjects. Prevalence of infection was highest (98.39%) among the study subjects with past history of infection and this difference was statistically significant ( $p < 0.001$ ). A study conducted in urban slums of Mumbai reported that the prevalence of RTI was influenced by past history of RTI/STI and.<sup>[19]</sup> incomplete treatment may contribute to recurrence of infection

In the present study out of 637 married women, partner history of infection was reported by 58 women, prevalence of infection was highest among them (94.83% vs 30.22%) with statistically significant difference. Bote MM et al reported consistent findings where the women whose husbands were symptomatic, had higher odds (2.35) of having STI.<sup>[19]</sup>

## CONCLUSION

- In the present study the prevalence of self-reported symptoms of RTI/STI was 31.45%. Most common symptom was lower abdominal pain (57.32%)
- Menstrual and personal hygiene plays a major role in the prevention of RTI.
- Reuse and washing of absorbent without disinfectant are the potent risk factors.
- Proper treatment with antibiotics and simultaneous treatment of partner helps in preventing the recurrence of disease.

### Limitations

1. Prevalence would have been better enumerated if, self-reported symptoms were supplemented by genital examination and laboratory tests.
2. In collecting the data, women were asked to provide some retrospective information, hence recall bias was unavoidable.

### Recommendations

1. Menstrual hygiene of women in the slums should be improved by motivating them to use sanitary pads.
2. Complications of unsafe abortion should be educated to the women by local health workers like Anganwadi workers and ANMs.
3. Regular health camps should be conducted in slums for early identification of symptoms and prompt treatment.

Financial support and sponsorship

Nil

Conflicts of interest

There are no conflicts of interest.

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