

The Burden and Risk Factors of Reproductive Tract Infections among Married Women Aged 15 to 49 Years in Urban Slum of Agra Uttar Pradesh

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Abstract

Introduction: In developing countries, reproductive tract infection among women commonly goes undiagnosed and their sequel causes various complications.

Objectives: To find out the prevalence of RTI/STI through a syndromic case approach and its correlates among women of reproductive age group.

Material and Methods: A community-based cross-sectional study was carried out among 500 eligible married women residing in urban slums of Agra by using WHO syndromic case approach for diagnosis of RTIs/STIs.

Results: The overall prevalence of RTI/STD was found to be 32.80% where vaginal discharge (22.60%) and lower abdominal pain (8.20%) were the most common syndromes. On multivariate analysis, religion, caste, type of absorbent used during menses, and history of IUD use were found to be significantly significant.

Conclusion: The result of this study highlights the high prevalence and potential risk factors that contribute to the occurrence of RTI. It also emphasizes the need of training and education session of the participants to identify the early symptoms of RTI.

Keywords: Humans, Female, Prevalence, Cross-sectional studies, Poverty areas, Developing countries, Sexually transmitted diseases, Vaginal discharge, Reproductive tract infections, Social class, Religion, World health organization.

INTRODUCTION

The concept of reproductive health has been used to define a wide range of health concerns relating to the events that surround or affect human reproduction. The basic elements of reproductive health are: responsible reproductive and sexual behavior; 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.^[1] The prevalence of RTI symptoms among women has been found to range from 17 to 44% in different national and international

studies.^[2] Prior studies have reflected upon various factors influencing the occurrence of RTIs, mainly socioeconomic status, poor hygiene, intra-uterine device (IUD) insertion, place of residence (urban & rural), male substance abuse, extramarital sexual relations, and non-use of condoms. Recognising and addressing the risk factors is required to combat the growing burden of RTIs. Although many studies have been conducted in various parts of the country with

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the aim of documenting the prevalence of STIs/RTIs and its risk factors, there is a lack of substantial literature from urban slums and resettlement areas. The current study was undertaken to fill this existing lacuna.^[3]

OBJECTIVES

- To find out the prevalence of reproductive tract infections among married women of reproductive age group by using WHO syndromic case approach.
- To determine the risk factors associated with the reproductive tract infection.

MATERIALS AND METHODS

This cross-sectional study was conducted among women of reproductive age group residing in urban slums of Agra district of Uttar Pradesh. The study was conducted from August 2019 to December 2021. A total of 500 women of reproductive age group were studied and data collection was done using a house to house survey technique in selected urban slum of Agra. The study was approved by the Institutional Ethical Committee of S. N. Medical College, Agra (through letter number IEC/2021/46). Inclusion criteria included all those women of reproductive age group who were married, were present at the time of house visit and gave verbal consent to participate in the study. A sample size of 475 was calculated with an estimated prevalence of 27%,^[4] precision of 15%, and confidence interval of 95%. The sample size was calculated by using the formula of $4 pq/d^2$. On adding 5% for non-responders, it was raised to the round figure of 500.

Sampling Technique

A multistage random sampling technique was used for the study. Firstly a complete list of municipal wards with the name of slums was obtained from the Agra municipal cooperation office. Then, one ward was selected randomly using a random number table. In next stage, at least two slums were selected randomly from that ward. For the selection of study participants, central location of each selected slum was chosen and direction to start the interview was randomly decided by spinning a pencil where the direction of the pencil point faced was chosen and the nearest household was visited in that direction. All the available women of the reproductive age group were interviewed from each consecutive household. Every house was covered following left-hand principle until desired sample size was achieved from each slum. All the participants were informed about the study's objectives, and their verbal consent was taken before the interview. Questions regarding their biosocial profile, menstrual history and hygiene, sexual hygiene, history regarding previous delivery, abortion and family planning and treatment-seeking behavior were asked in their local language. The data was collected by researcher herself or by trained healthcare workers.

As the topic is quite sensitive, the research team requested all male household members to give some privacy for the interview. Confidentiality was assured and maintained throughout the study. Women having one or more of the

Table 1: Socio-demographic profile of studied participants

Parameter	Category	Number (%)
Age (in Years)	≤30	266 (53.20%)
	>30	234 (46.80%)
Religion	Hindu	264 (52.80%)
	Muslim	236 (47.20%)
Cast	General	75 (15.00%)
	OBC	257 (51.40%)
	SC	168 (33.60%)
Type of Family	Nuclear	309 (61.80%)
	Joint	191 (38.20%)
Age at Marriage	Below 18 years	192 (38.40%)
	18 years & above	308 (61.60%)
Educational status	Illiterate	168 (33.60%)
	Up to middle school	185 (37.00%)
	Up to intermediate	116 (23.20%)
	Graduate & post graduate	31 (6.20%)
Occupation status	Working	101 (20.20%)
	Non- working	399 (79.80%)
Socioeconomic status (Modified Kuppaswamy classification)	Upper class	2 (.40%)
	Middle class	194 (38.80%)
	Lower class	304 (60.80%)
Total		500 (100%)

following symptoms or signs suggestive of reproductive tract infection (RTI) or sexually transmitted disease (STD) like vaginal discharge, lower abdominal pain and genital ulcers, were identified and classified by using WHO's syndromic case management protocol. The women suffering from RTI/STI and not under treatment were counselled to visit the gynecology department of S. N Medical college, Agra for further management.

The information thus collected was entered in a Microsoft Excel spreadsheet. Frequencies were obtained using descriptive statistical analysis. Chi-square and Fisher's exact test were used for bi-variate analysis while multiple logistic regression test was used for multivariate analysis.

RESULTS

The present study was conducted among five hundred married women in the reproductive age group residing in urban slum of Agra. Of the 500 participants, more than half (53.20%) were 30 years or below, 52.80% were Hindu by religion, 51.40% belonged to other backward caste and 61.80% had a nuclear family. More than one-third (34.41%) of the women were reportedly married even before attaining the legal age of marriage. One-third (33.60%) were illiterate and 79.80% were unemployed or housewives. The majority (60.80%) of the study participants belonged to the lower socioeconomic class (Table 1).

The study shows that out of 500 married women of reproductive age group residing in urban slum of Agra, 164 (32.80%) had symptoms suggestive of reproductive tract infections (Figure 1).

Figure 2 shows that vaginal discharge was the main symptom of RTI/STI being complained by 68.93% of the symptomatic women with an overall prevalence of 22.60%. This was followed by lower abdominal pain associated with (lower back, irregular menstruation, pain during menstruation, pain during sexual intercourse and fever) in 25% with an overall prevalence of 8.20%. Other symptom related to RTI/STI was genital ulcer which was present in 6.10% of the symptomatic females with an overall prevalence of 2%. While none of the study participants was found to have inguinal bubo in the present study.

Table 2 Shows that on bivariate analysis a statistically significant association was observed between participant's age, religion, cast and educational status with presence of RTI/STI among them while association between presence of RTI/STI and their family type, age at marriage, occupational status and socioeconomic status were found to be statistically non- significant.

Table 3 shows that maximum (37.08%) prevalence of RTI/STI was seen among females using cloth pieces during menses. Similarly, women who had a positive history of abortion or had a history of IUCD use reported a higher proportion of RTI/STI (49.63 and 54.90%, respectively). Women who were delivered at home had much higher prevalence of RTI/STI (60.41%) in comparison to those who had institutional (27.68%) deliveries, while RTI/STI was more prevalent (44.61%) in those who

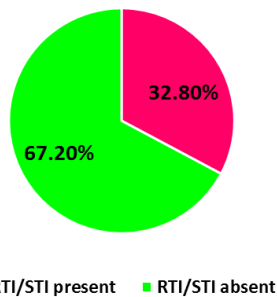


Figure 1: Distribution of study participants according to presence of RTI/STI

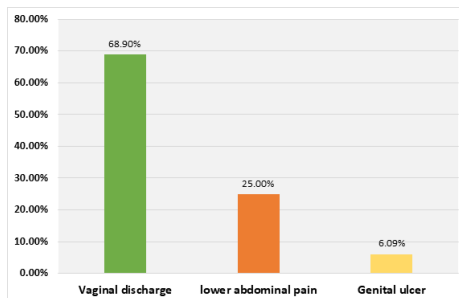


Figure 2: Distribution of the symptoms among participants having RTI/STI

were delivered by untrained personnel. Nulliparous females reported a maximum (50%) prevalence of RTI/STI. All the above risk factors of RTI/STI were found to be statistically significant.

Table 4 enumerates the variables which were found to have a statistically significant association with presence of RTI/STI among women of reproductive age group on a bivariate analysis namely: age, religion, caste, education of women, type of absorbent used during menses, parity, history of abortion, place of delivery, person who conducted last delivery and IUCD use. After adjusting for confounding factors by using logistic regression analysis, four factors were found to be statistically significant with the presence of RTI/STI

Table 2: Socio-demographic risk factors for reproductive tract infection among symptomatic women of reproductive age group

Characteristics	RTI/STI Present (%)	RTI/STI Absent (%)	Total (%)	χ^2 & p-value
Age (in years)	99 (37.22)	167 (62.78)	266	$\chi^2 = 5.03$
≤30	65 (27.78)	169 (72.22)	234	p-value = .02
>30			266	
Religion	68 (25.76)	196 (74.24)	264	$\chi^2 = 12.585$
Hindu	96 (40.68)	140 (59.32)	236	p-value = .00
Muslim			264	
Cast	15 (20)	60 (80)	75 (15)	$\chi^2 = 9.345$
General	98 (38.13)	159 (61.87)	257	p-value = .00
OBC	51 (30.36)	117 (69.64)	168	
SC			168	
Type of family	93 (30.10)	216 (69.90)	309	$\chi^2 = 2.681$
Nuclear	71 (37.17)	120 (62.83)	191	p-value = .10
Joint			309	
Age at marriage	58 (30.21)	134 (69.79)	192	$\chi^2 = .950$
Below 18 years	106 (34.41)	202 (65.58)	308	p-value = .33
18 years & above			192	
Educational status	70 (41.67)	98 (58.33)	168	$\chi^2 = 16.75$
Illiterate	62 (33.51)	123 (66.49)	185	p-value = .000
Up to middle school	3 (9.68)	87 (75)	116	
Up to intermediate		28 (90.32)	31 (23.20)	
Graduate & postgraduate			31 (6.20)	
Occupational status	29 (28.71)	72 (71.23)	101	$\chi^2 = .95$
Working	135 (33.83)	264 (66.16)	399	p-value = .32
Non-working			101	
Socio-economic status	0	2 (100)	2 (.40)	$\chi^2 = 1.29$
Upper class	61 (31.44)	133 (68.56)	194	p-value = .52
Middle class	103 (33.88)	201 (66.12)	304	
Lower class			304	

Table 3: Reproductive health related risk factors for RTI/STI

Characteristics	RTI/STI Present (%)	RTI/STI Absent (%)	Total (%)	χ^2 & p-value
Type of absorbent used	65 (27.90)	168 (72.10)	233 (46.60)	$\chi^2 = 4.75$
Sanitary pad	99 (37.08)	168 (62.92)	267 (53.40)	p-value = .02
Clothes				
History of abortion	68 (49.63)	69 (50.36)	137 (27.40)	$\chi^2 = 24.26$
Positive	96 (26.45)	267 (73.55)	363 (72.60)	p-value = .000
Negative				
IUCD use	28 (54.90)	23 (45.10)	51 (10.20)	$\chi^2 = 12.58$
IUCD users	136 (30.29)	313 (69.71)	449 (89.80)	p-value = .000
IUCD non users				
Husband with symptoms of RTI/STI	8 (44.44)	10 (55.55)	18 (3.60)	$\chi^2 = 1.14$
Positive	156 (32.36)	326 (67.63)	482 (96.40)	p-value = .28
Negative				
Duration of married life	52 (36.36)	91 (63.64)	143 (28.60)	$\chi^2 = 1.50$
Up to 5 year	112 (31.37)	245 (68.63)	357 (71.40)	p-value = .47
>5 year				
Place of delivery	106 (27.68)	277 (72.32)	383 (76.60)	$\chi^2 = 13.36$
Institutional	29 (60.41)	19 (39.58)	48 (9.60)	p-value = .001
Home	8 (29.62)	19 (70.37)	27 (5.40)	
Both				
Person conducting last delivery	29 (44.61)	36 (55.38)	65 (14.19)	$\chi^2 = 5.44$
Untrained person	118 (30.03)	275 (69.97)	393 (85.81)	p-value = .01
Trained person				
Number of children	21 (50)	21 (50)	42 (8.40)	$\chi^2 = 8.60$
None	78 (34.06)	151 (65.94)	229 (45.80)	p-value = .03
1-2	55 (27.36)	146 (72.64)	201 (40.20)	
3-4	10 (35.71)	18 (64.28)	28 (5.60)	
More than 4				

among married women of reproductive age group: religion, caste, type of absorbent used during menses and history of IUCD use.

DISCUSSION

In this study the prevalence of RTI/STI was found to be 32.80%. This was in accordance with the Preeti *et al.* (2021)^[5] and Pallavi *et al.* (2015)^[6] 30% and 35.80%, respectively. This study revealed that among all symptomatic females, majority 68.90% complained of vaginal discharge, almost similar to Shamima *et al.* (2012)^[7] who reported 68.10% prevalence of vaginal discharge among symptomatic females in Kolkata city. In our study lower abdominal pain was found to be the second most common symptom with a prevalence of 25.00% which is similar to study done by Vidya *et al.* (2016)^[8] in Etawah and Nandan *et al.* (2002)^[4] in Agra. The present study shows that only 1.8% of all females had a complaint of genital ulcer which was similar to the studies of Anmol k *et al.* (2020)^[9] and Vidya *et al.* (2016).^[8]

In present study maximum (37.22%) prevalence of RTI/STI was found in 30 or below age females. Similar results were observed by Anindita *et al.* (2018)^[10] who reported that women in 21-30 years age group had the highest i.e. 49.2% prevalence as compared to other age groups. Muslims females in our study reported more (40.68%) symptoms as compared to Hindus which is similar to study done by Mani G *et al.*

Table 4: Determinants of RTI/STI's using multivariate logistic regression analysis

Variables	Odds ratio	p-value
Age	.98 (.95-1.01)	.147
Religion	2.20 (1.33-3.64)	.002
Caste	.68 (.46-.99)	.043
Women education	.92 (.79-1.07)	.290
Type of absorbent used during menses	1.37 (1.02-1.83)	.034
Women parity	1.00 (.98-1.02)	.995
Place of delivery	1.01 (.99-1.03)	.399
Person conducting last delivery	1.00 (.99-1.01)	.873
History of IUCD use	3.25 (1.73-6.11)	.000

(2014)^[11] in Tamil Nadu and Sangeetha S *et al.* (2012)^[12] in Hubli. Regarding caste, the prevalence was maximum i.e. 38.13% in other backward castes (OBC). RTI/STI was also higher in females belonging to joint families. This may be on account of ignorance of the symptoms and reluctance for the treatment by the females in the joint families due to lesser privacy and decision-making power. Our study shows that the prevalence of RTI/STI was decreased with increase in literacy level of women. Several studies like Anmol *et al.* (2020)^[9] in Himachal Pradesh, Nisha *et al.* (2019)^[13] in Lucknow and Das

S *et al.* (2018)^[11] in Kolkata also observed that prevalence of RTI/STI was decreased with increase in level of education. Regarding a woman's occupational status, the prevalence of RTI/STI was less among the employed (28.71%) than the unemployed (33.83%) ones. This was in accordance with Deepak *et al.* (2018),^[14] Dileep S *et al.* (2017)^[15] in Karnataka and Kafle P *et al.* (2016)^[16] in Nepal which reported a higher prevalence of RTI/STI among unemployed females. Regarding socioeconomic status, prevalence was found to be increasing with a decrease in a woman's socioeconomic status. It was maximum (33.88%) in lower class females. Comparative findings were also reported in studies where the maximum prevalence of RTI/STI was observed in class V participants i.e. 33.60% by Charu *et al.* (2015)^[17] in New Delhi and 34.40% by Shamima *et al.* (2012)^[7] in Kolkata. According to the type of material used during menses, prevalence of RTI/STI was found to be minimal (27.90%) among women who used sanitary pads. Similar findings were observed by Deepak *et al.* (2018)^[14] in Karnataka and Mani G *et al.* (2014)^[11] in Tamil Nadu. It was observed that RTI/STI was more among female with a positive history of abortion in our study. Similar findings were observed by Anindita *et al.* (2018)^[10] in West Bengal, Anjana *et al.* (2015)^[18] in Delhi and Vidya *et al.* (2016)^[8] in Etawah. In our study more than half (54.90%) of the IUCD users reported RTI/STI. Similar findings were observed by Nisha *et al.* (2019)^[13] in Lucknow, Anindita *et al.* (2018)^[10] in West Bengal, Dilip S *et al.* (2017)^[15] in Karnataka and Vidya *et al.* (2016)^[8] in Etawah. Home deliveries were a significant risk factor (60.41%) for RTI/STI in the present study. Comparable to this finding Anindita *et al.* (2018)^[10] in West Bengal also found that prevalence of RTI/STI was higher among home-delivered females. RTI/STI was more (44.61%) prevalent among those who were delivered by untrained personnel. Similar findings were observed by Kafle P *et al.* (2016)^[16] in Nepal and Vidya *et al.* (2016)^[8] in Etawah. However, nulliparous females had more (50%) RTI/STI in our study while it was lesser (31.22%) in parous females. This finding is in consistence with the studies of Mudra *et al.* (2016)^[19] in Ahmedabad.

After adjustment for confounding factors by using logistic regression analysis following four factors were found to remain significant: religion (OR: 2.20, 95% CI: 1.33–3.64), caste (OR: .68, 95% CI: .46–99), Type of absorbent used during menses (OR: 1.37, 95% CI: 1.02–1.83), and history of IUCD use (OR: 3.25, 95% and CI: 1.73–6.11). Similar findings were observed by Anindita *et al.* (2018)^[10] in West Bengal where parity (OR: 1.336, 95% CI: 1.1–1.6), type of absorbent (OR: 4.04, 95% CI: 1.96–83) and history of IUCD use (OR: 1.3, 95% CI: 1.1–1.7) were found to be statistically significant after applying multivariate logistics regression analysis. Bhilwar *et al.* (2015)^[3] in New Delhi also found that Parity (OR: 1.7, 95% CI: 1.2–2.6) and history of IUCD use (OR: 11.8, 95% CI: 4.3–32.0) were significantly associated with RTI/STI among women on logistics regression analysis. Prusty *et al.* (2013)^[20]

by using DLHS-3 data where religion was found to be significantly associated.

LIMITATIONS

The present study is based on syndromic case management of RTI/STI by WHO which includes the management of symptomatic cases only. In spite of best motivation from the investigator and due to covid restrictions, the respondents, especially asymptomatics, might not have given complete and unbiased information. Manpower limitations and COVID-19 restrictions resulted in the survey being conducted over a longer period than stipulated for such studies.

CONCLUSION

On the basis of above findings, it is concluded that the prevalence of RTI/STI among women (15–49 years) of urban slums of Agra city was 32.8%. On bivariate analysis, the prevalence of RTI/STI was significantly found to be significantly associated with a woman's age, religion, caste, parity, education, type of absorbent used during menses, history of abortion and IUCD use, place of delivery and person who conducted the last delivery. After adjusting for confounding factors by using logistic regression analysis, four factors were found to be significantly associated with the presence of RTI/STI in our study: religion, caste, type of absorbent used during menses, and history of IUCD use.

RECOMMENDATIONS

The present study highlights the need to give attention to all women of urban slums of Agra who are suffering from reproductive tract infection for early and prompt assessment and management of RTI/STI with special Emphasis on other backward class and muslim women. Awareness, affordability and privacy are some of the major concerns that need immediate attention to promote the use of sanitary pad during menstruation. Women taking IUDs should be well informed for regular follow-up visits.

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