



THE AGA KHAN UNIVERSITY

eCommons@AKU

Community Health Sciences

Department of Community Health Sciences

June 2013

Reproductive tract infections among married women in peri-urban areas of Karachi, Pakistan: A population-based study

Neelofar Sami
Aga Khan University

Tazeen S. Ali
Aga Khan University, tazeen.ali@aku.edu

E. Khan
Aga Khan University, erum.khan@aku.edu

Follow this and additional works at: https://ecommons.aku.edu/pakistan_fhs_mc_chs_chs

 Part of the [Maternal and Child Health Commons](#), and the [Women's Health Commons](#)

Recommended Citation

Sami, N., Ali, T. S., Khan, E. (2013). Reproductive tract infections among married women in peri-urban areas of Karachi, Pakistan: A population-based study. *National Journal of Community Medicine*, 4(2), 195-200.

Available at: https://ecommons.aku.edu/pakistan_fhs_mc_chs_chs/677

Title page

Reproductive Tract Infections among married women in peri-urban areas of Karachi, Pakistan: A population-based study.

Authors

1. First Name: Neelofar (N), Sir Name: Sami

Qualification: MBBS, PhD

Designation: Assistant Professor

Affiliation: Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan

neelofar.sami@aku.edu

2. First Name: Tazeen (T), Middle Name: Saeed (S), Sir Name: Ali

Qualification: BScN, Msc

Designation: Assistant Professor

Affiliation: School of Nursing and Department of Community Health Sciences, Aga Khan University, Karachi Pakistan

tazeen.ali@aku.edu

3. First Name : Erum (E), Sir Name: Khan

Qualification: MBBS, FCPS

Designation: Assistant Professor

Affiliation: Department of Pathology, Aga Khan University, Karachi, Pakistan

erum.khan@aku.edu

Address for Correspondence:

Dr. Neelofar Sami

Department of Community Health Sciences

Aga Khan University, Stadium Road

Karachi, 74800,

Pakistan

neelofar.sami@aku.edu

Abstract:

Background: In Pakistan, there is dearth of information about RTIs. A study was conducted in Karachi, Pakistan to determine the prevalence of and number and types of RTIs among non-pregnant women residing in squatter settlements in Karachi and their health seeking behavior.

Methods: The eligible women were interviewed followed by physical and pelvic examination by a trained physician in a nearby clinic. For laboratory testing, samples swabs were collected from vagina and endocervix.

Results: Overall, 23.8% of the women had laboratory-diagnosed RTIs . Nearly 2.6% had trichomoniasis and 1.7% were positive for syphilis. Bacterial vaginosis was diagnosed in 8.8% and vaginal candidiasis in 13.2 %. The women considered symptoms as normal and did not seek treatment.

Conclusion: The study indicates a high prevalence of RTIs among married women aged 15-49 residing in squatter settlements of Karachi with Bacterial vaginosis to be the most prevalent endogenous infection and trichomoniasis as the most common STI.

Key words: RTs, Bacterial vaginosis, Trichomoniasis, vaginal discharge, married women

Background:

Worldwide, Reproductive Tract Infections (RTIs) contribute substantially for ill health of both women and men¹ with a gloomier situation in developing countries². However, RTIs are gender asymmetric³ both due to biological and social factors. Biologically, women are at the higher risk of being infected than men with a single act of intercourse with the infected partner⁴. In addition, women are more likely to suffer from asymptomatic RTIs leading to delay in seeking care and diagnosis resulting in long term complications such as Pelvic Inflammatory Disease (PID), tubal adhesions and infertility and ectopic pregnancy⁵. Of the social factors, not only women are likely to bear consequences due to lack of awareness about symptoms of RTIs but many infections being asymptomatic suffer negligence too. Furthermore, culture of silence makes the symptomatic women diffident for seeking care because of the embarrassment associated with symptoms of RTIs³.

Another important aspect vis-à-vis RTIs is its control which has become a main concern in many countries⁶. However, appropriate information is crucial in this context not only for apportion of resources but for planning of appropriate strategies to provide timely management⁷. The situation is particularly dismal for the developing countries due to the scarcity of epidemiological data and is one of the major hurdles in this regard where encumbrances of these infections have been estimated mostly from the results of the facility-based surveys. Only a few population-based studies have been conducted in India⁸, Bangladesh⁹, Egypt¹⁰ and Nigeria¹¹. Situation is not different in Pakistan as there is limited data on the prevalence of and health-seeking behavior for RTIs in the general population. A study was conducted in squatter settlements in Karachi, Pakistan to determine the prevalence of and number and types of RTIs among non-pregnant women residing in squatter settlements in Karachi and their health seeking behavior.

Materials and Methods:

Study site and population

This study was conducted in metropolitan city of Karachi where nearly 18.5 million people reside. The City-District of Karachi is divided into eighteen towns governed by elected municipal administrations. The towns are sub-divided into 178 union councils (UCs), which are the core element of the local government system.

For the study, three union councils were randomly selected whose household information was obtained from National Program for Family Planning (FP) and Primary Health Care (PHC). The program serves the underserved and poor communities of the rural and peri-urban areas for provision of FP and PHC services at their door steps. The program is implemented through Lady Health Workers (LHW) where each worker is allocated to serve 150 households. The health services provided by the LHWs are through monthly home visits and static health houses established within their residence.

Sampling strategy and enrollment

A computerized list of all the households in three selected UCs was generated. A random sample of households was drawn for enrolling married non-pregnant women aged 15–49 years. Only one woman from each household was enrolled. An eligible respondent was randomly selected from households with more than one woman. Pregnant women and those who reported a delivery within last six weeks or having antibiotics within last two weeks were excluded. Approval for the study was obtained from the ethical review committee in Aga Khan University. Written, informed consent was obtained from all participating women. Before recruitment, the women were explained the process of enrollment, physical and vaginal examinations and samples collection for investigating RTIs and STIs. Additionally, they were informed that if found infected, free of cost treatment would be provided accordingly.

The sample size was estimated to be 1050 with 350 women from each union council.

Data Collection

The women who consented to participate were administered questionnaire by trained interviewers to collect information on the following areas: menstrual and obstetric history (menstrual pain and irregularities, number of births, places of delivery and birth attendants, pregnancy outcomes), gynecologic symptoms (vaginal discharge; itching, sores or ulcers in the genital area; lower abdominal pain; frequency, burning or pain during micturation), health-seeking behavior (treatment sought, health care providers consulted, if not, why), sexual history (age at marriage, frequency of and pain during sexual intercourse) and contraceptive use (use of modern/natural contraceptive methods).

Once the interview was complete, each woman was then taken to a nearby clinic where a trained female physician conducted a physical examination including a speculum examination of the cervix and vagina followed by a bimanual pelvic examination to detect clinical signs of RTIs. For laboratory testing, the physician collected samples swabs from the vagina and endocervix after cleaning of the ectocervix. It was ensured that women must not be menstruating on the day of examination and sample collection because menstrual blood could interfere with the laboratory tests.

Four tests were done at the time of sample collection: 1) Vaginal pH measured with a pH strip indicator, 2) Vaginal wet mounts prepared and immediately examined for evidence of candidiasis, 3) Gram staining of vaginal smears prepared for presence of clue cells and 4) amine odor tests

Following samples were collected: an endocervical swab for *Neisseria gonorrhoeae*, Gram stained smears for clue cells, a high vaginal swab for bacterial vaginosis and *Candida* spp., and a posterior fornix swab for *Trichomonas vaginalis*. A blood sample was collected for the diagnosis of syphilis. Table 1 describes the samples, tests, and criteria used for diagnosing the respective RTI

Specimens were transported at the appropriate temperature to and were tested at the Microbiology Department of Aga Khan University Hospital (AKUH). Twenty percent of all investigations done in on-site clinics were double-checked in AKUH for quality control.

Respondents positive for any infection were provided treatment immediately. In cases of STIs, treatment was provided for both the partners. Women were re-contacted individually if the laboratory reports indicated either a need for any modifications to treatment or identified infections not diagnosed at the time of examination. All women who were advised treatment had a follow-up visit at their homes and were asked for the symptoms and offered a retest if they agreed.

Statistical Methods

Data were double-entered using Epi-Info and error rate was less than 1%. The statistical analyses were done using SPSS software (version 14.0 for windows). The prevalence of infection (with 95% confidence intervals) was calculated using the confirmed laboratory results. Categorical data were compared using chi square test of independence.

Results

Participation

The calculated sample size was 1050 but a total of 1002 women were actually interviewed with the response rate of 95.4%. The main reasons for declining to participate in the study included lack of permission from the family, fear of getting some disease diagnosed and non-availability of husbands to get their permission. Of the 1002 women interviewed, a total of 945 underwent physical and pelvic examination and their samples could be collected. The main reasons for refusal for examination and sample collection included fear for pelvic examination and prick for blood collection, lack of permission from husband/in laws for visiting the facility and fear of getting some serious illness diagnosed.

Social and Demographic Characteristics

On average, the women were 31.0 years old, and their husbands were 28.2 years old (Table 2). Nearly one third of them (37%) were illiterate and one quarter reported to have completed

secondary education. Women's mean ages at marriage and menarche were 18.3 ± 4.0 and 13.2 ± 1.1 years respectively. Of the 1002 women, 123 reported (12.2%) to be infertile. Remaining 879 women reported a total of 3892 pregnancies. A little over 40% reported 4 and more pregnancies.

Prevalence of infections

Clinical histories

Women were asked about the symptoms related to RTIs. Nearly 57% of women reported having some kind of gynecological symptoms. Many women reported multiple complaints; the most common symptoms reported were vaginal discharge and lower abdominal pain mentioned by 48.2% and 18.5% women respectively. (Table 3)

Laboratory-diagnosed RTIs

Overall, 23.8% of the women had laboratory-diagnosed RTIs (Table 4). Approximately 2.6% had trichomoniasis and 1.7% was positive for syphilis. Many more women had endogenous RTIs: bacterial vaginosis was diagnosed in 8.8% and vaginal candidiasis in 13.2%. No women had ulcers or warts on vulva or mucopurulent cervical discharge and gonorrhoea was not detected in any sample.

Symptoms and Infections

Among the 539 women who initially reported symptoms, nearly one third had RTIs according to the laboratory findings (Table 4). Some had multiple infections, as 169 infections occurred in 161 women. By comparison, 18% of the 406 women who did not report any symptoms at that time had laboratory-diagnosed RTIs. Women suffering from BV were mostly symptomatic compared to vaginal candidiasis where 13% of the women were asymptomatic.

Treatment-Seeking Behavior

Among symptomatic women, a little over half (56%) had not sought any treatment for their gynecologic problems. The main reason for not seeking care for the symptoms reported by almost half of them was assuming their symptom to be normal. Other less common reasons were a health facility situated far away from home, hesitation in discussing the problem with a male provider, waiting for LHWs to visit home and husband's non-availability for accompanying to visit a facility. Of the 44% who had sought treatment, the first choice for majority of the women was home remedies or traditional medicines advised by friends or relatives. The preferred HCP was a traditional or a faith healer for those who consulted one. A very small proportion went to local qualified practitioners.

DISCUSSION

The study indicates a high prevalence of RTIs among married women aged 15-49 residing in squatter settlements of Karachi with Bacterial Vaginosis to be the most prevalent endogenous infection and trichomoniasis as the most common STI. Similar findings have been shown by other community-based studies conducted in Pakistan¹²⁻¹⁵. Parallel trends have been evident by the studies conducted in South Asian regions such as India^{16, 17} and Bangladesh^{18,19} which reveal endogenous infections to be more prevalent compared to STIs. However, there has been some difference for the prevalence of two common endogenous infections i.e. bacterial vaginosis and thrush. Our study has revealed higher prevalence of thrush similar to studies conducted in Pakistan¹³⁻¹⁵, India^{16,17} and Bangladesh¹⁸. However, two studies conducted in India showed a higher prevalences of bacterial vaginosis compared to candidal infections^{20,21}.

The high prevalence of endogenous infections among women of child bearing age is alarming as these have been identified to end up in severe consequences such as pelvic inflammatory disease²² and poor pregnancy outcomes. The later include premature rupture of membranes²³, and preterm labor and delivery²⁴. The situation becomes alarming in a country like Pakistan where 70% of deliveries are conducted by unskilled birth attendants²⁵ unlikely to be able to manage the premature newborn.

Additionally, infections during pregnancy and post partum period such as chorioamnionitis²⁶ postpartum endometritis²⁷, post-caesarean delivery wound infections and postsurgical

infections²⁸ have been associated with presence of prior vaginal endogenous infections. The women of child bearing age in our study are at the risk of aforementioned conditions. Attempts should be made to screen and treat vaginal infections during pregnancy as studies have shown that such management for BV result in reduced incidences of maternal and neonatal morbidities^{29,30}.

The presence of *Trichomonas vaginalis* (TV) infection among study participants is also a matter of great concern. TV has been reported to be the most common curable STI worldwide and is likely to increase the risk of HIV transmission^{1,2}. The later is a matter of concern for a country like Pakistan which is categorized as ‘low prevalence and high risk’ in context of HIV/AIDS.

There are certain limitations in the study in relation to laboratory tests used for diagnosing RTIs. For detecting gonorrhoeae and trichomoniasis, culture and microscopy were used instead of polymerase chain reaction (PCR). PCR has higher sensitivity and specificity than culture and microscopy³¹. This could have resulted in missing a considerable proportion of two infections.

An important aspect of the study is poor health seeking behavior of women both in terms of neglecting the symptoms and opting for a non-scientific treatment. Neglecting the symptoms not only leads to underreporting of RTIs but keeps the women infected for a long time with all of its consequences.

The preference of traditional healers over qualified practitioners by the infected women was due to negligence, social inhibition and inappropriate health care system.

Conclusion

The findings of the study have certain policy implications for improving the reproductive health of women in the country. Women require appropriate health education about gynecologic morbidity specially focusing on stigma and embarrassment related to RTIs. Additionally, we recommend concentrating on training of the health care providers and provision of health care through Primary Health Care. This would make the services more accessible resulting in women feeling comfortable in seeking treatment and not discouraged by trepidation for solitude and confidentiality. Integration of health services could be a solution as proposed by ICPD to deal

these issues holistically and has been supported by many studies conducted in regional countries. However, an effective and an efficient delivery system is the need of the day for improving the health status of women in the country.

Competing interests

The authors declare that there are no competing interests for this study. The study was conducted by funding provided by University Research Council, Aga Khan University, Karachi, Pakistan.

Authors' contributions

NS conceived of the study, participated in its design, carried out the literature review and wrote the first draft of the manuscript. TSA performed many of the interviews, trained and supervised the data collection and analyzed the data. EK provided technical input for the investigations and diagnosis component. Both TSA and EK and edited the final draft of the paper. All authors read and approved the final manuscript.

Acknowledgement

We would like to thank the LHWs field and editorial assistance; women respondents from the community whose participation helped us to complete the study; Dr. Mehtab S Karim and Dr. Nadeem Zuberi for technical support.

References

1. World Health Organization. Global prevalence and incidence of selected curable sexually transmitted infections. Overview and Estimates Geneva: World Health Organization 2001.
2. Over M, Piot P. HIV infection and other STDs in developing countries: public health importance and priorities for resource allocation. *Journal of Infectious Diseases* 1996;174 Suppl.2:S162-S175.
3. Dixon-Mueller R, Wasserheit J. *The Culture of Silence: Reproductive Tract Infections Among Women in the Third World*. Washington, DC: International Women's Health Coalition, 1991.
4. Willard CJ. Reproductive tract infections, In Robert A. Hatcher et al, 1998, *Contraceptive technology*, 17th revised edition (New York: Ardent Media):180
5. Germain A, Holmes KK, Piot OP, Wasserheit JN. *Reproductive Tract Infections: Global Impact and Priorities for Women's Reproductive Health*. New York: Plenum Press 1992.
6. van Dam CJ. HIV, STD and their current impact on reproductive health: the need for control of sexually transmitted diseases. *International Journal of Gynaecology and Obstetrics* 1995;173 Suppl.2:S121-S129.
7. World Health Organization. Interpreting reproductive health. ICPD+5 Forum, The Hague, The Netherlands, 8–12 February; 1999. WHO document WHO/CHS/RHR/99.7
8. Koenig M et al., Investigating women's gynecological morbidity in India: not just another KAP survey. *Reproductive Health Matters* 1998; 6(11):84–97
9. Hawkes S et al., Reproductive tract infections: prevalence and risk factors in rural Bangladesh. *Bulletin of the World Health Organization* 2002; 80(3):180–188
10. Younis N et al., A community study of gynecological and related morbidities in rural Egypt. *Studies in Family Planning* 1993; 24(3): 175-186
11. Brabin L et al., Reproductive tract infections and abortion among adolescent girls in rural Nigeria. *Lancet* 1995; 345 (8945): 300–304

12. Dure nayab Reproductive Tract Infections among Women in Pakistan: An Urban Case Study. *The Pakistan Development Review* 2005; 44 : (2) 131–158
13. National AIDS Control Program. *STI Prevalence Study in Pakistan*. Islamabad: 2005; National AIDS Control Program.
14. Ghauri K, Shah SA. Patterns of STD Syndromes in Sindh. *Infectious Diseases Journal of Pakistan* 1997
15. Karachi Reproductive Health Project. Prevalence of Sexually Transmitted Diseases Amongst Women in Low-Income Communities of Karachi. *Infectious Diseases Journal of Pakistan* 1997 4:2.
16. Garg S, Bhalla P, Sharma N, R. Sahay AP, Saha P et al. Comparison of Self-Reported Symptoms of Gynecological Morbidity with Clinical and Laboratory Diagnosis in a New Delhi Slum. *Asia- Pacific Population Journal* 2001; 16 (2) 75–92.
17. Mayank S, Bahl R, Bhandari N. Reproductive Tract Infections in Pregnant Women in Delhi, India. *International Journal of Gynecology & Obstetrics* 2001; 75:1, 81–82.
18. Hawkes S, Morison L, Chakraborty J, Gausia K et al. Reproductive Tract Infections: Prevalence and Risk Factors in Rural Bangladesh. *Bulletin of the World Health Organization* 2002; 80: (3) 180–188.
19. Ahmed M U, Mirza T, Khanum P A, Khan MA, Ahmed S, Khan MH. Management of Reproductive Tract Infections in Rural Bangladesh. *International Journal of STD & AIDS* 1999 ; 10: 263.
20. Garg S, Sharma N, Bhalla P. Reproductive Morbidity in an Indian Urban slum: need for health action. *Sex Transm Infect* 2002; 78: 68-69
21. Prasad JH, Abaraham S, Kurz MK. Reproductive Tract Infections among young married women in Tamil Nadu India. *International Family Planning Perspectives* 2005; 31(2):73–82
22. Population Council. *Reproductive Tract Infection: A set of fact sheet* 1999. Population Council Bangkok.
23. Leitich H, Bodner-Adler B, Brunbauer M, Kaider A, Egarter C, Husslein P. Bacterial vaginosis as a risk factor for preterm delivery: a meta-analysis. *Am J Obstet Gynecol* 2003;189:139–47

24. Hay P E, Lamont RF, Taylor-Robinson D, Morgan DG, Ison C, Pearson J. Abnormal Bacterial Colonisation of the Genital Tract and Subsequent Preterm Delivery and Late Miscarriage. *British Medical Journal* 1994; 308: 295–298
25. WHO factsheet Proportion of births attended by a skilled health worker 2008 updates 2008. Geneva.
26. Hillier SL, Martius J, Krohn MA, Kiviat N, Holmes KK, Eschenbach DA. A case-control study of chorioamnionic infection and histologic chorioamnionitis in prematurity. *N Engl J Med* 1988; 319:972–8.
27. Watts DH, Krohn MA, Hillier SL, Eschenbach DA. Bacterial vaginosis as a risk factor for post-cesarean endometritis. *Obstet Gynecol* 1990; 75:52–8.
28. Soper DE, Bump RC, Hunt WG. Bacterial vaginosis and trichomonas vaginitis are risk factors for cuff cellulites after abdominal hysterectomy. *Am J Obstet Gynecol* 1990; 163:1016–23.
29. McDonald HM, O’Loughlin JA, Vigneswaran R, Jolley PT, McDonald PJ. Bacterial vaginosis in pregnancy and efficacy of short-course oral metronidazole treatment: a randomized controlled trial. *Obstet Gynecol* 1994; 84(3):343–8.
30. Hauth JC, Goldenberg RL, Andrews WW, DuBard MB, Copper RL. Reduced incidence of preterm delivery with metronidazole and erythromycin in women with bacterial vaginosis. *N Engl J Med* 1995; 333:1732–6.
31. Wendel KA, Erbeding EJ, Gaydos CA, Rompalo AM. *Trichomonas vaginalis* polymerase chain reaction compared to standard diagnostic and therapeutic tools for detection and treatment of vaginal trichomoniasis. *Clin Infect Dis* 2002; 35:576-80.

Table 1: Laboratory and clinical Assays and criteria for diagnosis of various RTIs

Laboratory Diagnosed RTIs	Sample	Detection Assay	Criteria
STIs			
Trichomoniasis	Post vaginal Fornix	Culture on Diamond's medium Wet Mount preparation	Positive culture of viable <i>Trichomonas vaginalis</i> or positive wet mount preparation test
Syphilis	Serum	Rapid Plasma reagin test Particle agglutination test	Current infection: Positive serology by rapid plasma reagin test Past infection: Positive result on the <i>Treponema pallidum</i> particle agglutination test
Gonorrhea	Cervical Smear	Culture on Thayer-Martin selective agar medium Gram Staining	Isolation of <i>Neisseria gonorrhoeae</i> identification of gram-negative intracellular diplococci
Endogenous Infections			
Bacterial Vaginosis	High vaginal swab	Per vaginal examination pH strip indicator amine odor tests Gram staining	Presence of at least three of the following: watery vaginal discharge elevated pH (>6) positive amine odor test presence of clue cells
Vaginal candidiasis	High vaginal swab	Culture on Sabouraud's medium	Positive culture with the presence of clinical signs (red, inflamed tissue and curdy white discharge)

Table 2: Percentage distribution of married women aged 15-49 years, by selected social, demographic and reproductive characteristics, Karachi, 2007-08

Variables	Women (n=1002)
Age in years	
Mean age	31.0 ± 6.8
< 20	6.1
21-30	47.2
31-40	38.9
41 - 46	7.8
Literacy Status	
Illiterate	36.9
Primary	17.4
6-10	24.9
Secondary & above	6.6
Age at marriage (years)	
Mean age	18.3 ± 4.0
12-15	26.6
16-20	49.4
21-25	19.5
26 and >	4.5
Number of pregnancies	
	3.5 ± 2.2
0	3.0
1-3	55.5
4-6	30.2
7 and>	11.1

Table 3: Prevalence of gynecological symptoms among women surveyed in squatter settlements in Karachi, in 2007-08

Symptoms	n	%
Vaginal discharge	483	48.2
Vulvar itching/ burning	109	10.8
Lower abdominal pain	185	18.4
Painful micturation	148	14.7
Painful coitus	98	9.9

Table 4: Numbers and percentages of women with laboratory- diagnosed RTIs

Laboratory-Diagnosed RTIs	Total women (n=945)		Women with symptoms (n=539)		Women without symptoms (n=406)	
	n	%	n	%	n	%
STIs						
Trichomoniasis	25	2.6	19	3.6	6	1.5
Syphilis	2	0.2	2	0.2	0	0.0
Gonorrhea	0	0.0	0	0.0	0	0.0
Endogenous infections						
Bacterial Vaginosis	83	8.7	69	12.8	14	3.4
Vaginal candidiasis	132	13.9	79	14.6	53	13.2
Total	242	25.6	169	31.3	73	17.9

The proportion of symptomatic women was significantly greater ($p \leq 0.05$) than the proportion asymptomatic for all infections except vaginal candidiasis