

ORIGINAL ARTICLES

Prevalence and Factors Associated with Lower Reproductive Tract Infections Among Married Women Aged 18–49 in Dong Phu Commune, Long Ho District, Vinh Long Province, 2018

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ABSTRACT

Objective: To understand the patterns and associated factors of reproductive tract infections among married women aged from 18 to 49 in Dong Phu Commune, Long Ho District, Vinh Long Province in 2018.

Methods: A cross-sectional study was conducted with 420 married women aged 18-49 by systematic sampling. Participants were invited to have a gynecological examination and answer a questionnaire at Dong Phu commune health station.

Results: Of 420 women, 43.6% had lower reproductive tract infections, and those who had bacterial vaginosis accounted for 36.2%, vaginal candidiasis accounted for 9.3%, and *Trichomonas vaginalis* accounted for 1.0%. Factors associated with lower reproductive tract infections, including occupation, abortion history, and adherence to treatment, were found in this study.

Conclusion: The prevalence of genital tract infections (by one of three types) is 43.6%. It is necessary to enhance counseling services and behavior change communication for women who work as peasants, gardeners, fisherwomen, housewives; and to improve the quality of abortion services and the awareness of treatment adherence.

Keywords: lower reproductive tract infections, women, Vinh Long.

INTRODUCTION

Lower reproductive tract infections are caused by microorganisms and divided into the following two main groups: sexually transmitted infections and the overgrowth of vaginal flora (1). Globally, more than 1 million sexually transmitted infections are acquired every day (2). About 30%–60% of women have reproductive tract infections (3,

4). In Viet Nam, the rate of reproductive tract infections also varies from 27%–60% (5-7).

Lower reproductive tract infections are one of the most significant causes of morbidity. In some cases, these infections can have serious reproductive health consequences such as infertility or mother-to-child transmission. Adverse birth outcomes including stillbirths and newborn deaths could be a result of



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infections in pregnant women (2). In Viet Nam, aerobic vaginitis increased the risk of tubal diseases by 2.4 times (5). Most of the lower reproductive tract infections could be cured without long-term effects on women if they are identified early and treated accurately. However, the majority of lower reproductive tract infections have no symptoms or only mild symptoms that may not be recognized (2).

Dong Phu is one of four communes which is hard to reach in rural Long Ho District. Living conditions, educational levels, and knowledge about prevention and treatment of diseases are not good. An appropriate intervention program could be developed by the commune health station if the socioeconomic group better understand the prevalence of and the reasons for lower reproductive tract infections. This study describes the patterns and associated factors of reproductive tract infections among married women aged 18–49 in Dong Phu Commune, Long Ho District, Vinh Long Province in 2018.

METHOD

Study design

This is a cross-sectional study.

Study setting

The study was conducted in Dong Phu Commune, Long Ho District, Vinh Long Province and the data was collected in 2018.

Study participants

The participants are married women aged 18–49 in Dong Phu Commune, Long Ho District, Vinh Long Province.

Sample size and Sampling

In this study, the total sample size was estimated to be 420 (based on the formula for estimating the proportion of women who have reproductive tract infections, which was about 44% of those in Dong Phu Commune in 2017, $\alpha = 0,5$; $d = 0,05$).

Participants were selected from 2,348 married women at the age 18–49 years using systematic sampling.

Measurements

Outcomes: Specimens were collected for laboratory analyses. Wet mount microscopy of vaginal secretions was done to detect for *Trichomonas vaginalis* and *Candidiasis vaginalis*. For the diagnosis of bacterial vaginosis, 20 leukocytes per optical field were used as a criterion.

Independent variables include:

- Socioeconomic characteristics that include age, occupation, education and household economics.
- Obstetric history: having an abortion before, having gynecological exams, history of having lower reproductive tract infectious diseases and adherence to treatment when needed.
- Source of water used for genital wash, receiving counseling on examination and treatment of reproductive tract infections.
- Hygienic management practice which was assessed using a set of questions on menstrual hygiene management (frequency of changing pad, washing, and having sex), daily genital hygiene (underwear drying place, vaginal douche, time of douching), and the frequency

of dipping the body underwater. Good hygienic management practice was defined as answering over 70% of the questions correctly.

Data collection process

We invited selected participants to the Dong Phu commune health station. They all agreed to participate in the study. A structured questionnaire was used to collect data on socio-economic and reproductive characteristics. This was followed by a clinical examination and collection of samples for laboratory tests. The procedure followed the guidelines for gynecological examination from the Ministry of Health. Gynecologists examined the patients, took vaginal swabs, and immediately transported the specimens to the laboratory technician for testing under microscopy.

Data analysis

Data were entered using EpiData 3.0 software and analyzed by SPSS 18.0. Proportions and percentages were used for describing reproductive tract infection prevalence. Odds ratio, 95% confidence interval, with a significance level of $p < 0.05$ were used to identify the differences by groups.

Ethical consideration

The protocol of this study was approved by the Hanoi University of Public Health Ethics Committee (Decision No. 132/2018/YTCC-HD3, dated 15/03/2018). All participants in the study were asked for their consent before collecting data, and all had complete rights to withdraw from the study at any time. All participants were informed about their gynecological status and if a woman was found to have treatable reproductive tract infection, the doctor provided appropriate therapy using standard treatment guidelines based on available antibiotics under the health insurance scheme.

RESULTS

Characteristics of respondents

The sociodemographic profiles of 420 married women who participated in this study are presented in Table 1. Women 35–49 years of age accounted for 75% of the participants in this study. About 72.9% of the women worked as peasants, fisherwomen, or housewives. Only 14% were poor and near-poor. Most of the participants (74.1%) only finished secondary school or lower, and more than half of them (52.9%) had an abortion before.

Table 1. Characteristics of study participants

	Characteristics	N (n)	Percentage (%)
Age	18-34	105	25.0
	35-49	315	75.0
Occupation	Peasants, housewives, fisherwomen	306	72.9
	Worker	94	27.1
Household economics	Poor, near-poor	59	14.0
	Non-poor	361	86.0

	Characteristics	N (n)	Percentage (%)
Education level	Secondary school and lower	311	74.1
	High school and higher	109	25.9
Having an abortion	No	198	47.1
	Yes	222	52.9

Prevalence of lower reproductive tract infections

Laboratory investigations of the vaginal infections revealed that overall, 43.6% of

women had lower genital tract infections (Table 2). The most common vaginal infections were bacterial vaginosis (36.2%) and candida albicans (9.3%). Trichomonas vaginalis was diagnosed in 4 (1.0%) women.

Table 2. Lower genital tract infections among married women of reproductive age in Dong Phu in 2018

Infections	Frequent (n)	Percentage (%)
Bacterial vaginosis	152	36.2
Candida albicans	39	9.3
Trichomonas vaginalis	4	1.0
Lower genital tract infections	183	43.6

Associated factors of lower reproductive tract infections

Bivariate analysis was performed to identify the occurrence of lower reproductive tract infections with other factors. Significant differences in the prevalence of lower

reproductive tract infections were found when age, education level, occupation, abortion status, hygienic practice, adherence to treatment, water source, and the opportunity to receive counseling and information on examination and treatment were considered (Table 3).

Table 3. Bivariate analysis of lower reproductive tract infections with other factors

Characteristics	Reproductive tract infections				OR	95% CI	p	
	Yes		No					
	n	%	n	%				
Age	18-34	37	35.2	68	64.8	1.59	1.01 – 2.56	0.047
	35-49	146	46.3	169	53.7	1		
Education level	Secondary school and lower	147	47.3	164	52.7	1.81	1.15-2.87	0.010
	High school and higher	36	33.0	73	70.0	1		
Household economics	Poor, near-poor	26	44.1	33	55.9	1.02	0.58-1.78	0.934
	Non-poor	157	43.5	204	56.5	1		
Occupation	Peasants, housewives, fisherwomen	149	48.7	157	51.3	2.23	1.41-3.53	<0.001
	Worker	34	29.8	80	70.2	1		
Having an abortion	Yes	115	51.8	107	48.2	2.05	1.38-3.04	<0.001
	No	68	34.3	130	65.7	1		
Good hygienic practice	Yes	15	28.3	38	71.7	2.17	1.14 – 4.16	0.016
	No	168	45.8	199	54.2	1		
Adherence to treatment	No	138	50.9	133	49.1	2.57	1.55-4.27	<0.001
	Yes	27	28.7	67	71.3	1		
Having a gynecological examination	<=1 time /year	132	46.3	153	53.7	1.21	0.93-2.16	0.099
	>=2 times/year	51	37.8	84	66.2	1		
Had lower reproductive tract infection before	Yes	163	45	199	55	1.85	0.87-2.80	0.133
	No	20	34.5	38	65.5	1		
Water source	Unsafe	70	53.0	62	47.0	1.75	1.15-2.65	0.008
	Safe	113	39.2	175	60.8	1		
Receiving counseling, information on examination and treatment	No	56	51.9	52	48.1	1.57	1.01-2.43	0.044
	Yes	127	40.7	185	59.3	1		

A multivariate analysis was then performed using an Enter approach to identify the associated factors of lower genital tract infections. All variables that were associated with lower reproductive tract infections were included in the bivariate analysis. The Hosmer–Lemeshow test was used to assess how those factors fit a set of observations.

After controlling for other factors, lower reproductive tract infections were not differentiated by age, education level, water source, and the opportunity to receive counseling or information on examination and treatment. However, occupation, abortion

history, and adherence to treatment were associated factors with lower reproductive tract infections (Table 4).

Women who worked as peasants and did housework were 1.85 times more likely to have lower genital infections than those who were workers (95% CI: 1.09–3.16). Women who had an abortion were 1.52 times more likely to have lower genital infections than those who had not (95% CI: 1.02–2.38).

Women who did not adhere to treatment faced a 1.8-fold higher risk of a female genital infection (95% CI: 1.04–3.07) than those who adhered to treatment.

Table 4. Multivariable analysis of associated factors on lower reproductive tract infections

	Characteristics	aOR	95% CI	p
Age	18 – 34	0.88	0.53 – 1.46	0.626
	35 – 49	1	-	-
Education level	Secondary school and lower	1.11	0.65 – 1.88	0.691
	High school and higher	1	-	-
Occupation	Peasants, housewives, fisherwomen	1.85	1.09 – 3.16	0.022
	Worker	1	-	-
Having an abortion	Yes	1.52	1.02 – 2.38	0.038
	No	1	-	-
Good hygienic practice	Yes	0.68	0.35 – 1.35	0.279
	No	1	-	-
Adherence to treatment	No	1.8	1.04 – 3.07	0.033
	Yes	1	-	-
Safe water	No	1.31	0.84 – 2.24	0.231
	Yes	1	-	-
Receiving counseling, information on examination and treatment	No	1.10	0.68 – 1.78	0.685
	Yes	1	-	-

N = 420. Hosmer & Lemeshow test $\chi^2 = 8.945$; *df* = 8; *p* = 0.347

DISCUSSION

In this study, we found that lower reproductive tract infections affected nearly half of the participants (43.6%). This rate is similar to that found in the report from the Dong Phu commune health station in the previous year and a study conducted in rural areas of Ha Noi (8) and among infertile women in Hue city (5). However, the prevalence may be underestimated because we were not able to perform the test for chlamydia, gonorrhea, hepatitis B, HIV, and syphilis. Poor specificity and low positive predictive value for the detection of reproductive tract infections also need to be considered as indicated from previous studies (6). Some studies, such as those done among 32% of female migrant workers, show a lower rate of reproductive tract infections (7). However, this study used a self-reporting approach, and the majority of lower reproductive tract infections have no or only mild symptoms (2).

The most common vaginal infection among women was bacterial vaginosis (36.2%), followed by *Candida albicans* (9.3%) and *Trichomonas vaginalis* (1.0%). This pattern is similar to previous studies from Viet Nam (5, 8, 9) and other countries such as India (4). In resource-poor settings like Dong Phu, if the women presenting with reproductive tract infection symptoms cannot go to a higher level health center for laboratory tests, the treatment of the common endogenous infections *Candida* and *Candida albicans* can be considered (7).

We found a higher prevalence of lower reproductive tract infections in women with a history of abortion, which is similar to the results of another study among women

in rural Viet Nam (10). The present study documents that abortion-seeking women have a relatively high prevalence of reproductive tract infections compared to the general population of women of reproductive age (6). Abortion may reflect the high-risk sexual behavior of the woman or her partner. Since the sampling frame was cross-sectional, we could not identify a causal relationship. However, further research should be done to determine if unsafe abortions may be related to reproductive tract infections.

A higher prevalence of lower reproductive tract infections was found among women with lower education levels, those who stay at home doing housework or work as peasants, those who have had an abortion, those who have poor hygienic practices, those who do not adhere to treatment, those who use unsafe water for hygiene, and those who do not receive counseling and information on examination and treatment. We need to pay more attention to those specific groups and to implement an intervention program for women in the commune. We should highlight the use of clean water for genital hygiene, the seeking of treatment from care providers, and the adherence to treatment in counseling and health education programs.

CONCLUSION

In this study, we found that lower reproductive tract infections affected nearly half of the participants (43.6%). The most common vaginal infection among women was bacterial vaginosis (36.2%), followed by *Candida albicans* (9.3%) and *Trichomonas vaginalis* (1.0%). We believe that the treatment of the common endogenous infections *Candida* and

Candida albicans can be considered for those who are unable to access laboratory testing at higher health facility levels.

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