Brief Original Article

Reproductive tract infections (RTIs) among married non-pregnant women living in a low-income suburb of Beirut, Lebanon

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Abstract

Introduction: This study aimed to identify reproductive tract infections (RTIs) in married, non-pregnant women, aged 18 to 49 years, living in a low-income suburb of Beirut, and to investigate the relationship between demographic and socioeconomic factors and these infections.
Methodology: Among 1,015 women recruited for the study, 502 were found eligible and 441 were medically examined. Appropriate specimens were collected for *Nisseria gonorrhea*, *Chlamydia trachomatis*, *Trichomonas vaginalis,* candidiasis, and bacterial vaginosis.
Results: The results showed a relatively high prevalence of RTIs (28.2%). The prevalence rates of different agents were as follows: 22.9% of the women were positive for *T. vaginalis*, 8.8% for candidiasis, 4.5% for bacterial vaginosis, and 1% for *N. gonorrhea*; none of the women were positive for *C. trachomatis*. Regression analysis showed that women between the ages of 30 and 39 were twice more likely to have *T. vaginalis* as compared to younger women. Furthermore, women whose husbands were taxi drivers were at higher risk of acquiring *T. vaginalis* (OR = 2.2) as compared with women whose husbands occupation was listed as skilled/unskilled. This conclusion can be drawn for the odds of developing any RTI (OR = 2.15). Moreover, those participants with the lowest income were twice as likely to have any RTI compared to those with higher incomes.
Conclusions: This study shows a relatively high prevalence of RTIs (*T. vaginalis* mainly). It urges further in-depth research on cultural practices and economic factors to understand the pattern of sexual behavior in this community.

Key words: reproductive tract infections; laboratory diagnosis; community care; Lebanon

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Introduction

Reproductive tract infections (RTIs) constitute a significant proportion of infectious diseases globally [1]. In fact, both curable and non-curable RTIs are responsible for serious complications and consequences among women, men and families [2]. In addition to the psychological and emotional distress associated with these infections, RTIs are known to have serious social and economic implications, particularly in developing countries [3,4].

Considering the unique epidemiology of RTIs in each community and among special populations, it has been recommended that countries must determine the most common RTIs prevalent in their own populations to establish and implement nationally comprehensive and standardized prevention and treatment protocols [5,6]. This study gives particular attention to an impoverished and underserved population of women residing in the southern suburb of Beirut, the capital of Lebanon, Hey el Selloum. It aims to identify the prevalence of various RTIs in this community and seeks to investigate the link, if any, between such infections and selected demographic and socioeconomic determinants. In light of their significance to women's health and higher prevalence among females [5], this study investigated the frequency of *Nisseria gonorrhea, Chlamydia trachomatis, Trichomonas vaginalis,* candidiasis and bacterial vaginosis (BV) among married, non-pregnant women, living in a low-income suburb of Beirut, Lebanon.

Methodology

Study sample

The data presented in this paper is part of a larger community-based randomized clinical trial conducted

to assess the impact of a community-based psycho-social intervention on medically unexplained vaginal discharge (MUVD) and common mental distress (CMD). The recruitment campaign was extended over a seven-week period in April-May 2009 and attracted 1,015 married, non-pregnant women aged 18 to 49 years and reporting vaginal discharge. The women completed a screening baseline interview questionnaire that also included a mental health assessment. Only women who were screened to have low CMD were subjected to gynecological examination and the necessary laboratory tests.

Of those 1,015 women, 502 women were eligible to participate in the study and these women were referred to medical examination and undertook the laboratory tests needed to confirm whether they were suffering of any of the aforementioned five RTIs. Laboratory data was available on 441 women in total.

Laboratory examinations

The "COBAS AMPLICOR *Nisseria gonorrhea/Chlamydia trachomatis* Test" (Roche Diagnostics, (Indianapolis, USA) was used for qualitative *in vitro* detection of *N. gonorrhea and C. trachomatis*. "Tv latex" and "Candida Latex" (Kalon Biological Ltd, (London, UK) were used for *T. vaginalis and candidiasis detection.* The Nugent Score technique was employed to assess bacterial vaginosis. DNA was extracted using a "QIAamp DNA Mini and Blood Mini Kit" (QIAGEN, (Hilden, Germany). The PCR assays were performed using an automated thermocycler PCRSprint (ThermoHybrid, (Waltham, USA) for the confirmation of *T. vaginalis and candidiasis*.

Statistical analysis

Data was entered using CSPro version 4.0 (US Census Bureau, Washington, USA). It was managed and analyzed using the Statistical Packages for Social Sciences-version 16 (IBM, Chicao, Il, USA). Analysis revolved around uni-variate analysis and bivariate analysis.

Results

The results of our study showed a relatively high prevalence of RTIs (28.2%). Among the studied population, Prevalence rates to five studied agents were as follows: 22.9% of women were positive for *T. vaginalis*, 8.8% for candidiasis, 4.5% for bacterial vaginosis, and 1% for *N. gonorrhea*; none were positive for *C. trachomatis*.

The prevalence of infections in relation to certain demographic and socioeconomic variables is shown in Table 1. Women between the ages of 30 and 39 years had higher rates of *T. vaginalis* and *Candida* compared to women in either younger or older age groups, whereas women in the age group of 40 to 49 had higher rates of BV. Less educated women had high rates of *T. vaginalis* and *Candida* infections compared to women with higher education levels. Regarding the employment status of women, those who either worked previously or who had never worked had higher rates of infections compared to working women with respect to all the RTIs assessed except for BV, for which women who had never worked showed the lowest prevalence rates. Women with lower net family incomes (monthly earnings of US$400 or below) had higher rates of infections (acquiring any RTI) when compared to women with higher family incomes.

Women between the ages of 30 and 39 were twice more likely to have *T. vaginalis* as compared to younger women. Women who listed their husbands' occupation as a taxi driver were found to be at higher risk of acquiring *T. vaginalis* (OR = 2.2) when compared with women who listed their husbands' occupations as skilled/unskilled. The same conclusion can be drawn for the odds of developing any RTI (OD = 2.15). Net family income showed a significant correlation ($p = 0.038$). The odds of having any RTI were two times higher for women whose net family income was less than US$400 per month than for women whose net family monthly income was more than US$650.

Discussion

To the best of our knowledge, this is the first population-based study of women of reproductive age in Lebanon using highly sensitive and specific assays. The high prevalence of *T. vaginalis* reported in our study (22.9%) is in agreement with the results obtained in an earlier study from Egypt (18%) [7]; however, it contrasts with the observations of an earlier study from a rural community in East Lebanon (1.2%) [8] and with those of other recent studies from some Arab countries (0.6%) [9,10]. Our study also shows that only 8.8% of women were positive for Candidiasis, which had the highest prevalence after *T. vaginalis* (22.9%), a pattern is similar to that noted in a study from Giza [7]. As for BV infections, several studies have shown that it is the most common cause of vaginal discharge among women of reproductive age [7,11]. It was surprising that only 4.5% of our studied population were diagnosed with BV.

Table 1. Prevalence of infections in relation to specified variables among married women 18-49 years of age in low-income suburb of Beirut

Variables	Number of Participants	Any RTI % +ve prevalence	TV (n = 101) % positive	Candida (n = 39) % positive	BV (n = 22) % positive
Age (years)					
18-29		25.0			
30-39	108	32.1	16.7	8.3	4.6
40-49	204	29.9	27.5	11.3	3.9
18-49	126		21.4	5.6	7.1
Education					
Primary/Illiterate	128	31.2	23.4	8.6	5.5
Intermediate	214	29.6	24.3	10.3	3.7
High school	70	29.2	22.9	5.7	7.1
College/University	28	24.0	10.7	7.1	7.1
Employment Status					
Works currently	41	23.7	14.6	4.9	7.3
Worked previously	153	39.3	28.8	12.4	8.5
Never worked	247	24.5	20.6	7.3	2.4
Employment Status of the Husband					
Works currently	421	29.7	23.2	8.8	5.0
Worked previously	19	27.8	21.1	10.5	5.3
Occupation of the Husband					
- Skilled / Unskilled	86	19.2	16.3	5.8	0.0*
- Taxi driver and other professional skills	78	36.4	32.1	10.3	6.4
- Own business	110	29.8	22.7	9.1	5.5
- Employee	155	31.6	22.56	9.76	6.71
Monthly Family Income ($US)					
Less than 400	107	36.9	29.0	12.1	5.6
400 – 650	197	28.6	23.4	8.6	4.1
650 – 2,000	117	26.6	19.7	6.8	6.0
More than 2,000	10	0.0	0.0	0.0	0.0

* Statistically significant measures

** Occupation of the husband: - Skilled/Unskilled = tailor, plumber, hair dresser, janitor, *etc*.; Employee = being employed in a private company

RTI = Reproductive tract infection

TV = *T. vaginalis*

BV = Bacterial vaginosis

Chlamydia was shown to be a common RTI in Kuwait [9] and Iran [12], which contradicts sharply with the results of our study, where no positive *C. trachomatis* was identified. *N. gonorrhea* was diagnosed in only 1% of the population tested in the current study, a finding that is similar to that among Jordanian women who have certain sociocultural similarities with our studied population [10].

Our study shows that RTIs and specifically *T. vaginalis* are prevalent in the studied population. These findings indicate the need to promote and adopt preventive and clinical measures in the studied community. Emphasis on RTI screening, promotion of health awareness, and reproductive advocacy at policy level are recommended. The results of this study constitute an important basis for future interventions and point to the need for further in-depth research looking at social and cultural determinants of RTI in Lebanon and the region at large.

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