Early diagnosis and correlations of sexually transmitted infections among women in primary care health services

Diagnóstico precoce e os fatores associados às infecções sexualmente transmissíveis em mulheres atendidas na atenção primária

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Abstract

Introduction: Sexually Transmitted Infections (STIs) in women remain a public health challenge due to high prevalence, difficulties to implement early diagnosis strategies and high rates of complications. **Objective:** Identify the prevalence of STIs among users of a primary health care clinic in São Paulo. **Methods:** Women, 18 to 40 years of age, were invited to self-collect vaginal specimens to be tested for *Chlamydia trachomatis, Neisseria gonorrhoeae*, and *Trichomonas vaginalis* by Polymerase Chain Reaction (PCR). Women were also invited to answer a demographic and sexual history questionnaire, either on the computer or face-to-face. **Results:** The prevalence of STIs obtained from the 781 women included in the study was: *Chlamydia trachomatis*: 8.4%, *Neisseria gonorrhoeae*: 1.9% and *Trichomonas vaginalis*: 3.2%. Thirteen percent tested positive for at least one out of the three STIs. The variables associated independently with a higher risk of STIs were: age under 20-years-old, more than two lifetime sexual partners, and self-perception of STI risk. The use of condoms as a contraceptive method proved to be a protective factor. **Conclusion**: The high prevalence found among these women indicates the need for the implementation of STI screening strategies in primary care settings in Brazil.

Keywords: sexually transmitted diseases; women; *Chlamydia trachomatis*; diagnosis; *Trichomonas vaginalis*; *Neisseria gonorrhoeae*; primary health care.

Resumo

Introdução: Infecções Sexualmente Transmissíveis (IST) em mulheres permanecem um desafio para a Saúde Pública: elevada prevalência, dificuldade para implantação de estratégias de diagnóstico precoce e elevada ocorrência de sequelas. **Objetivo:** Identificar a prevalência de IST em usuárias de um serviço de atenção primária à saúde em São Paulo. **Métodos:** Mulheres de 18 a 40 anos foram convidadas para realizar autocoleta de secreção vaginal para a detecção de *Chlamydia trachomatis, Neisseria gonorrhoeae* e *Trichomonas vaginalis* por meio de Reação em Cadeia da Polimerase (PCR). As mulheres também responderam a um questionário com questões demográficas e relativas à história sexual face a face ou autoaplicado por meio de um computador. **Resultados:** Das 781 mulheres incluídas no estudo, as prevalências obtidas foram: *Chlamydia trachomatis* (8,4%), *Neisseria gonorrhoeae* (1,9%) *e Trichomonas vaginalis* (3,2%). A positividade para pelo menos uma das três IST foi de 13%. As variáveis associadas independentemente com maior risco de IST foram: idade menor que 20 anos, mais de dois parceiros sexuais na vida e percepção de risco para IST; o uso de preservativo como método contraceptivo foi um fator protetor. **Conclusão:** A prevalência encontrada em usuárias indica a necessidade da implantação de estratégias de rastreamento de IST em serviços de atenção primária.

Palavras-chave: doenças sexualmente transmissíveis; mulheres; *Chlamydia trachomatis*; diagnóstico; *Trichomonas vaginalis*; *Neisseria gonorrhoeae*; atenção primária à saúde.

Introduction

Sexually transmitted infections (STIs) are the second leading cause of morbidity in young women in developing countries, after causes related to pregnancy and childbirth[1,2].

It is estimated that the number of people suffering from curable STIs in the world per year is approximately 340 million[3]. STIs considered curable by OMS[3] stands out those caused by etiological agents *Neisseria gonorrhoeae, Chlamydia trachomatis* and *Trichomonas vaginalis*. The impact of these STIs as a public health problem occurs not only for its high prevalence but also due to bad evolution of these infections to both an acute phase or a chronic phase with sequelae due to a lack of correct diagnosis and appropriate treatment: the pelvic inflammatory processes, perinatal morbidity and infertility[2].

Early diagnosis of curable STIs is extremely important in view of its synergy with HIV infection[5]. STIs increase the susceptibility and infectivity of the transmission of the HIV-1 infection[1,3-6]. Urgent STIs control measures should be implemented to contribute to the reduction of HIV transmission and for the prevention of these disease complications[6].

Approximately 50-80% of infections by *Chlamydia trachomatis* and *Neisseria gonorrhea* may be asymptomatic, specially in women[7,8] hindering early diagnosis.

The realization of early diagnosis of infection with Neisseria gonorrhoeae and Chlamydia trachomatis in asymptomatic individuals is possible through the use of nucleic acid amplification tests (NAATs)[1]. The use of tracking techniques for chlamydia and gonorrhea in young women under the age of 25 years is already implemented in many countries in Europe and America Norte[1]. In the United States of America (USA) Center for Disease Control and Prevention (CDC) recommended screening tests for chlamydia since 1993[9]. Some studies have shown that screening of *Chlamydia trachomatis* infection reduces the occurrence of

Rev Bras Epidemiol
2011; 14(3): xxx-xxx

2

Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.

pelvic inflammatory diseases[10,11]. Studies with the U.S. population since 2004 pointed to a positive cost-effectiveness of screening for chlamydial infection by using the NAATs techniques[12]. In developing countries there are limitations in costs and in the availability of assistance facilities with appropriate technology for STIs diagnose, which impairs the application of this strategy[1,4].

Estimates in Brazil, in 2003 indicated the occurrence of 1,967,200 new cases of *Chlamydia trachomatis*; 1,541,800 new cases of infection with *Neisseria gonorrhoeae* and 937,000 new infections with *Trichomonas vaginalis*[13]. High prevalence of STIs in the population shows the relevance of the implementation of strategies for early diagnosis. Thus, a study of STIs prevalence in a primary health care service which provide care to the general population is highly desirable. Results of this study pointed the feasibility of conducting prevention activities in similar services, supporting decision making deployment algorithm for early diagnosis. The aim of this study was to identify the prevalence of infections with *Chlamydia trachomatis, Neisseria gonorrhoeae* and *Trichomonas vaginalis* in women attending a primary health care service and to evaluate factors associated with some of these infections in the population under study.

Methodology

This study is part of an investigation of the acceptability and feasibility to the use of self-collected vaginal swabs and rapid tests for diagnosis of STIs. A detailed description of the methodology is published in another Article[14].

Location and study population

The study was conducted at a primary care health service located in the metropolitan region of Sâo Paulo. The territory of operation of the service is marked by heterogeneity of the population that lives and moves in the region, including residents, employees of small businesses, and people in a situation of social exclusion[15].

From April 2004 to March 2005, 818 women aged from 18 to 40 years were recruited. Most women were recruited from clients enrolled in the service. Nevertheless, 30% of the sample consisted of women living or working in the catchment area of the service not previously registered. A standardized instrument for eligibility was done to evaluate enrollment of the chosen population. Inclusion criteria used were: age between 18 to 40 years and self-reporting of reading and writing literacy. Exclusion criteria were considered when there was an acute gynecological complaint or self-reported use of antibiotics at the time of recruitment. The "Why searching the health service's" reasons were organized into categories as follows: wish to participate in the research; need of gynecological assistance; need of assistance because of other non-gynecological complaints. Women who reported a need of gynecological assistance were asked about the reason they needed an urgent consultation with a health professional. If so they were classified as women who reported an acute gynecological complaint. The recruitment strategies differed according to the population characterization: women already enrolled were invited to participate when they were in the health center; non-enrolled women were invited by the research team in various community's meeting points.

Study procedures

The eligible women were informed about the content and required to sign the Informed Consent Form (ICF). Subsequently, they answered an standardized questionnaire with questions about socio-demographic characteristics, service use, previous reproductive history, history of signs and symptoms related to STI sexual behavior, alcohol and illicit drugs and violence . Women were randomized to be included either in a group of 409 women who answered a face to face questionnaire or into another group of 409 women who should complete a self-administered questionnaire using a computer (computer assisted audio self-interview - ACASI)[16,17].

Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.

3

Rev Bras Epidemiol
2011; 14(3): xxx-xxx

The questionnaires were done privately by trained interviewers. The computerized questionnaire was answered by the user through an interface developed by the Population Council using Visual Basic 6.0® and Microsoft® Access 1997 to be audiovisual.

Procedures for specimen collection

After women applied the questionnaire to the strategy of self-collection of vaginal secretion, a new randomization were done so that 410 underwent self-collection at home and 408 in the clinic. All women received a small box containing a leaflet explaining the self-collected vaginal swabs and condoms. Women randomized to self-collection of vaginal secretion at home received a dry tube with a Dacron swab to collect vaginal swabs. They were instructed to return to the clinic and deliver the swab with a maximum of seven days. Women randomized to the self-collection of vaginal secretion in clinic were also scheduled for a maximum period of seven days. The self-collection procedures were identical in the two groups.

Laboratory Procedures

The material previously collected in swabs were stored (for up to three days refrigerated) and transported to the laboratory. Each swab was tested for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* using the technology of Polymerase Chain Reaction (PCR) with the COBAS® Amplicor equipment, Roche™. Additionally we performed a "homemade" PCR test for the detection of *Trichomonas vaginalis* using an adapted protocol from a previously developed method. This protocol was reviewed by an independent laboratory[18]. Samples from women in the group of the health service were also investigated for the presence of HPV, these results can be found in its proper (published) article[19].

Data analysis

The prevalence rates of infections by *Chlamydia trachomatis*, *Neisseria gonorrhoeae*

and *Trichomonas vaginalis* were described with their 95% respective confidence intervals. As there was no statistically significant difference according to the collection site (home or clinic) the results were presented together.

We analyzed the distribution of the variable presence of any STI, defined as positivity for Chlamydia and/or gonorrhea and/or trichomonas, according to variables related to socio-demographic characteristics, sexual behavior, history, symptoms related to STIs and a history of reproductive life. These variables showed statistically significant differences in distribution by type of interview (ACASI or face to face) so that the analysis of factors associated with the presence of any STI was adjusted by type of interview.

To examine the independent contribution of each factor associated influence in the presence of any STI a multivariate logistic regression was done. In this multivariate model all factors were tested in the analyses and they were adjusted by the type of interview. It was obtained a value of p<0.20 for test of likelihood ratio (MVR). We used a saturated model to obtain the final model further adjusted.

Ethical Aspects

All women enrolled participated in a group activity before initiating any procedure in the investigation. In this activity, standardized information was provided as the doubts about the study procedures, its benefits, its risks and strategies to STIs prevention. After the group women who were interested and eligible were individually informed about the research by reading the ICF. It was secured that the participation of users of the health service would not be compulsory. Women included in the study were told they could leave the research at any time they wished.

Anonymity as well as treatment was guaranteed for women with positive results of any of the tests performed. The treatment would include their partners[20].

The research project "The use of self-collection and self-diagnosis of STDs in a

primary health care service" complied with the guidelines and standards established by Resolutions 196/96, 251/97 and 292/99, and was approved by the Ethics of the Population Council in New York and in the Irmandade da Santa Casa de Misericórdia de São Paulo (Project No. 173/03) and by the National Research Ethics (Registration No. 12466). There are no conflicts of interest between authors and funding agencies or otherwise.

Results

1,038 women were invited to participate in the study, out of which 910 were eligible. 92 women refused to participate. The reasons given were lack of time or other pre-scheduled appointments. 818 women were included in the study and they answered the questionnaire. 31 of these women did not return to collect the material in the clinic or to deliver the material collected at home. Of the 787 samples examined, six were considered as inconclusive and are not included in this analysis.

The prevalence of *Chlamydia trachomatis* infection was 8.4% (95%CI 6.5–10.4), *Neisseria gonorrhoeae* infection 1.9% (95%CI 0.9–4.3) and infection by *Trichomonas vaginalis* was 3.2% (95%CI 0.2–4.3) (Table 1). Of the 781 women surveyed, 13% (95%CI 10.6–15.3) were positive for at least one STI investigated. Only one woman investigated had all three STIs. There was a woman with *Chlamydia trachomatis* and *Neisseria gonorrhoeae* and two women with *Chlamydia trachomatis* and *Trichomonas*

vaginalis. There was difference in the prevalence of *Chlamydia trachomatis* depending on the initial reason for visiting the service. Women with gynecological self-reported complaints showed higher positivity for *Chlamydia trachomatis* ($p<0.05$).

The prevalence of STIs according to socio-demographic characteristics is presented in Table 2. The analysis of sociodemographic characteristics according to type of interview is published[16,17]. It was found 22% prevalence of STIs in women younger than 20 years, the lower the age reported by these women was the greater prevalence of STIs (χ^2 for trend=10.35, $p<0.01$). In relation to other demographic variables is emphasized that despite the small number of women with skin color as indigenous self-reported, this group showed high STI prevalence (58%). The number of years of schooling was not associated with higher prevalence of STIs. Women who reported living with a sexual partner had lower STI prevalence 10.5%.

In relation to the signs and symptoms, women who reported pain in lower abdomen showed a higher prevalence of STIs, but this result was not statistically significant. The history of vaginal discharge and self-perceived risk of acquiring an STI were associated with higher prevalence of STI ($p<0.05$).

Women who reported using condoms as a contraceptive method had a lower prevalence of STIs (10.5%). Characteristics of reported sexual behavior was observed in the analysis adjusted only by the type of

Table 1. STI prevalence according to the reason of visiting the health service, CSEBF-AV, São Paulo (2004-2005)
Tabela 1. Prevalência de IST segundo o motivo da visita no serviço de saúde, CSEBF-AV, São Paulo (2004-2005)

Reason for visit to the service	% CT[1]	95%CI	% NG[2]	95%CI	% TV[3]	95%CI	Positivity to one of three IST	95%CI
Participate in the study	7.8	5.1–10.2	1.9	0.5–3.1	4.0	2.1–5.9	13.7	10.3–16.9
Self-reported gynecological complaint	14.1*	7.2–20.7	1.9	0.7–4.4	1.9	0.7–4.4	15.9	8.9–22.8
Other complaint nongynecologic	9.5	3.1–16.1	3.6	0.4–7.7	1.2	0.1–3.6	14.4	6.7–22.2
Total prevalence	8.4	6.5–10.4	1.9	0.9–2.9	3.2	1.9–4.3	12.9	10.5–15.3

[1] CT= *Chlamydia trachomatis*; [2] NG= *Neisseria gonorrhoeae*; [3] TV= *Tricomonas vaginalis*
*Statistically significant difference in the prevalence of CT according to the reason for the visit to the service ($p<0.05$).
Diferença estatisticamente significante da prevalência de CT segundo o motivo da visita ao serviço ($p<0,05$)

Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.

5

Rev Bras Epidemiol
2011; 14(3): xxx-xxx

Table 2. Distribution of sociodemographic characteristics, symptoms, reproductive life history, sexual behavior according to STI prevalence and their respective odds ratios and 95% CI, CSEBF-AV, São Paulo (2004-2005)

Tabela 2. Distribuição das características sociodemográficas, relativas aos sintomas, antecedentes de vida reprodutiva e comportamento sexual segundo a prevalência de IST e seus respectivos odds ratios e IC de 95%, CSEBF-AV, São Paulo (2004-2005)

Characteristic	Total	% positive	OR *	95%CI
Age				
31-40 years	257	8.9	1.0	-
21-30 years	420	13.1	1.4	0.8–2.6
Until 20 years	104	22.1	2.9	1.4–5.4
Years of schooling				
8 years or less	310	11.0	1.0	-
Over 8 years	453	12.6	1.2	0.6–1.7
Skin colour				
White	331	11.2	1.0	-
Black	120	15.0	1.4	0.8–1.8
Brown	316	12.3	1.1	0.7–2.5
Indigenous	12	58.2	11.3	3.4–37.5
Lives with the last sexual partner				
No	307	16.5	1.0	-
Yes	460	10.6	0.6	0.4–0.9
Vaginal discharge				
No	459	9.8	1.0	-
Yes	320	17.5	1.9	1.3–3.0
Pain in lower abdomen				
No	423	11.2	1.0	-
Yes	358	14.8	1.4	0.9–2.1
Self-perceived risk of STI				
None	222	8.0	1.0	-
Low	405	12.7	1.6	0.8–2.8
Hight	150	20.0	2.9	1.4–5.3
Use os condom as a contraceptive method				
No	286	14.7	1.0	-
Yes	382	10.5	0.7	0.3–1.1
No contraceptive usage	104	16.3	1.1	0.2–1.1
Number of lifetime sexual partners				
One	166	4.7	1.0	-
2-5 partners	347	12.6	2.7	1.3–6.1
Over 5 partners	215	20.0	4.8	2.1–10.6
Number of partners in the last six months				
One partner	578	11.6	1.0	-
2-4 partners	118	21.2	2.0	1.1–3.4
Over 4 partners	13	23.1	2.1	0.6–8.3
Use of alcohol or druga at last sex				
No	513	11.3	1.0	-
Yes	199	19.6	1.9	1.1–2.8

* Adjusted by interview type
Ajustada apenas por tipo de entrevista

Rev Bras Epidemiol
2011; 14(3): xxx-xxx 6 Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.

interview that the factors associated with a statistically significant greater prevalence of STIs were more than two lifetime sexual partners (p<0.01), more than two sexual partners in last six months (p<0.01), and use of alcohol or drugs before last sexual intercourse (RMV adjusted for type of interview=7.79, p=0.0053).

In the final model of logistic regression analysis, variables that remained independently associated with STIs variables adjusted among themselves, including the type of interview variable, namely: age, skin color, self-reported, number of sexual partners in life, self perception of risk for STIs and using condoms as a contraceptive method. The final adjusted model is presented in Table 3.

Discussion

The prevalence of *Chlamydia trachomatis* infection found in this study was 8.5% in women aged 18 to 40 years. Comparing the prevalence of this study with those obtained in other research conducted in Brazil, with the detection of *Chlamydia trachomatis* infection through use of laboratory techniques of PCR or ligase chain reaction (LCR), we observed that the results were similar. It is important to note that this diagnostic method has high sensitivity and specificity and it is considered the most effective one for diagnosis in asymptomatic individuals and in particular with the use of less invasive way of collecting a sample of urine or vaginal secretion collection[21]. The prevalence of *Chlamydia trachomatis* infection ranged from 8.5% to 17.1%[22-26] in studies conducted in public health services in different municipalities. In a study conducted in Rio de Janeiro in 2001, results showed found a prevalence of 8.5% (95%CI 5.0–13.3) in women attending a testing and counseling center (TAC)[22]. In the city of Vitória, they showed a prevalence of 8.9% (95%CI 6.5–11.9) in a group of 464 adolescents surveyed at 2002[23]. In a multicenter national study carried out in various capitals of Brazil with

Table 3. Final model of logistic regression for the factors associated to STI presence, CSEBF-AV, São Paulo (2004-2005)

Tabela 3. *Modelo final de regressão logística para os fatores associados à presença de IST, CSEBF-AV, São Paulo (2004-2005)*

Characteristic*	OR	95%IC
Age		
31–40 years	1.0	-
21–30 years	1.9	1.1–3.3
Up to 20 years	3.9	2.0–7.9
Colour of skin self-reported		
White	1.0	-
Black	1.3	0.6–6.8
Brown	1.0	0.5–1.7
Indigenous	12.0	3.3–44.8
Number of partners in life		
Single	1.0	-
2–5	2.5	1.1–5.5
6–10	5.1	2.3–11.5
Self-perceived risk of STI		
None	1.0	-
Low	1.4	0.7–2.8
High	2.4	1.2–4.6
Use of condoms as a contraceptive method		
No	1.0	-
Yes	0.6	0.4–0.9
Do not use a contraceptive method	1.1	0.5–2.4

* 748 women have been included in this analyses, all variables included have been adjusted by each other and interview type

Incluídas 748 mulheres nessa análise, todas as variáveis ajustadas entre si e por tipo de entrevista

3,303 women, in 2005, results showed a prevalence of 9.3% (95%CI 8.9–10.5) for *Chlamydia trachomatis*[24]. In other prevalence study conducted in Bahia in 2000, results were positive for *Chlamydia trachomatis* infection of 11.4% in 202 women volunteers who attended family planning clinic, 17.1% in women from a high school, and 12.9% in women living in the area and who enrolled in a health family team[25]. In Goiânia (GO) results showed a prevalence of 14.5% (95%CI 11.4–18.3) from *Chlamydia trachomatis* obtained by collecting endocervical cells in 427 adolescents (15 to 19 years) recruited from the local community in 2002 to 2003[26].

The prevalence of *Neisseria gonorrhoeae* obtained was 1.9% in a population with low exposure, slightly higher than that found in other surveys with collection of endocervical secretion. In Salvador, found a

Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.

7

Rev Bras Epidemiol
2011; 14(3): xxx-xxx

prevalence of 0.5% in 202 users of a clinical planning familiar[25].

The Ministry of Health found 1.5% prevalence of infection with *Neisseria gonorrhoeae* in a multicenter study with a sample of 2,913 women[24]. The prevalence in a population of VCT in Rio de Janeiro was much higher than 9.5% (95%CI 5.8–14.4)[22]; the difference to that found in this study may be attributed to the characteristics of this population that possibly VCT has greater exposure, or the occurrence of false-positive results that can happen due to the use of PCR for detection of *Neisseria gonorrhoeae.*

The prevalence of *Trichomonas vaginalis* found (3.2%) was very similar to that found in other studies in Brazil, even using different laboratory techniques. In a retrospective study conducted in Minas Gerais, we analyzed the results of direct examination of vaginal secretion obtained by collecting material for the Pap smear test in women who sought health care in 1998, found 3.4% of positive results[27]. In cross-sectional study conducted in 2000 with the first visit of pregnant women antenatal care in the state of Ceara in two municipalities (630 in Fortaleza Arati and 389 residents), we found prevalences of *Trichomonas vaginalis* 4.4 and 6.2% respectively[28].

In our study, we found a prevalence of 13% of at least one of the three STIs investigated with positive results in a population attending a primary care service, a population with low exposure. Risk factors independently associated with the presence of at least one of the three STIs investigated were: being young, the greater number of lifetime sexual partners, race or ethnicity self-reported as indigenous and high perception of risk. The protective factor was found to use condoms as a contraceptive method.

Younger women under the age of 24 years had increased odds of a positive result for at least one of the three STIs investigated. STIs can be taken as a major health risk of active sexually population[29]. Young people can be considered extremely susceptible to STIs due to several conditions, such as higher incidence of cervical ectopy and hormonal changes[4]. Moreover, young women are more likely to have a larger number of sexual partners, unprotected sex and more sex partners exposed to risks[4].

In Brazil, several studies have pointed to the increased risk of STIs among adolescents. In a study conducted in Manaus in 2004 with 1762 people found a prevalence of *Chlamydia trachomatis* infection in adolescents aged 15 to 19 years 14.8%[30]. In Goiania, found a prevalence of 19.6% for *Chlamydia trachomatis* infection in 296 adolescents, of whom approximately 70% were assintomáticas[31]. In the State of Ceará, in research with 592 women, found that age less than 19 years was a risk factor for STD[32]. Being young was also a risk factor for STIs in a multicenter study of pregnant women conducted by the Ministry of Health, the chance of infection in pregnant women under the age of 20 years to present was OR=2.1 (95%CI 1.3-3.5)[24].

The use of condoms as a contraceptive method reduced the risk of STIs. In other studies in Brazil the use of condoms as a contraceptive method was also a protective factor in relation to IST[23,25]. The possibility of dual protection is a powerful tool for the control of STIs in women. In comparison between two population-based surveys on sexual behavior conducted in Brazil in 1998 and 2005[33], there was an increase in condom use from 19% to 33% in subjects who reported stable sexual partner in the last 12 months. Household survey conducted in the cities of Salvador, Rio de Janeiro and Porto Alegre, in 2002, with 4,634 youths aged 18 to 24 years, it was found that a higher likelihood of condom use by women at last intercourse with stable sexual relationship[34]. It was also noted that the frequency of choice of condoms as a contraceptive method is still low in Brazil. In 2003, in São Leopoldo (RS), in research conducted with 578 women found a prevalence of condom use 17.3% as a method contraceptivo[35].

Skin color or ethnicity was associated with positivity for one of the three investigated STI: women who reported themselves as indigenous had higher risk of STIs. This result must be treated with caution because the number of women who reported themselves as indigenous in this study was very small, only 12.

Rev Bras Epidemiol
2011; 14(3): xxx-xxx   8   Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.

Further investigation should be conducted to investigate this issue.

Limitations

Some limitations in our study are worth mentioning. First, the study participants were recruited from a single primary health care service. Even the 30% who were not enrolled in the service were all living and/or working in the catchment area. Therefore, the results cannot be generalized. Despite its central location, the women who attend this service have several peculiarities inherent to the heterogeneity observed in the territory of the central region of metropolitan Sao Paulo. In our study only 10% of participants who were recruited out of service and in the clinic had a gynecological problem. Therefore, this study may represent a picture of the general population with low exposure to sexually transmitted infections.

The second limitation is related to both types of interview for the questionnaire to women: ACASI and face to face. The women interviewed by ACASI showed the difference in frequency of responses, with many reporting sensitive behaviors or unwanted. This information bias social desirability was minimized with the analysis of factors associated with STI adjusted for type of interview.

Another issue to be addressed is related to the prevalence of *Chlamydia trachomatis* and *Neisseria gonorrhoeae*, as they may vary according to population, the method of specimen collection, as well as the detection method[36]. It is noteworthy that the research method of collecting the material for the detection of *Chlamydia trachomatis*: self-collected vaginal swabs and not endocervical. Apparently, the collection did not affect the outcome prevalence was very similar to those obtained in other studies. Self-collection of vaginal secretion is already widely used for screening of *Chlamydia trachomatis* infection due to its convenience and practicality. In a systematic review[35] found that the prevalence of *Chlamydia trachomatis* obtained by self-collection and collection for detection of endocervical *Chlamydia trachomatis* PCR were very similar. In our study,

the acceptability of self-collection for both groups of women were above 90%, those who collected material in the clinic or home[14].

Finally, we must also take into account that women who reported any acute gynecological complaint would not be included in the study, this could also partly explain a slightly lower prevalence of STIs found. However, few women were excluded for the presence of an acute gynecologic complaint.

Conclusions

The relevance of the results presented in this study is above all the fact that it was conducted in a primary health care service, with women attending usual, and therefore, mostly asymptomatic. The prevalence of 13% positivity for at least one of the three STIs investigated in this study was an urgent need to adopt effective strategies for early detection of sexually transmitted infections in asymptomatic women, however the absence of laboratory testing at an affordable cost, and available to the population remains a major challenge. It also highlights that new techniques for collecting vaginal discharge, such as self-collection is possible and feasible in our reality, thus enabling a better grip of asymptomatic women.

Another important consideration is the need to strengthen the guidance for the use of condoms as a contraceptive method, due to its effective performance as a protective factor for twin pregnancy and STIs in particular in young women at greatest risk of STIs.

Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.

9

Rev Bras Epidemiol
2011; 14(3): xxx-xxx

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Early diagnosis and correlations of sexually transmitted infections among women in primary care health services
Luppi, C.G. et al.
11
Rev Bras Epidemiol
2011; 14(3): xxx-xxx