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ORIGINAL ARTICLE

Prevalence of Sexually Transmitted Infections (HIV, Hepatitis B, Herpes Simplex Type 2 and Syphilis) Among Asymptomatic Pregnant Women

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Abstract
Objectives To determine the current prevalence of four major sexually transmitted infections (STIs: HIV, Hepatitis B, Herpes simplex virus 2, and Syphilis) in asymptomatic pregnant women.
Methods This is a prospective study of 500 consecutive, apparently healthy asymptomatic pregnant women who were attending the antenatal clinic. The information regarding their socio-demographic and behavioral characteristics and obstetric performance was recorded. The blood samples was collected after obtaining their informed written consent from those who were tested for the HIV antibodies (NACO guidelines), HBsAg (ELISA test), HSV2-IgM (ELISA test), and Syphilis (VDRL and TPHA tests).
Results The overall prevalence of one or the other four STIs studied was 4.8 % with the highest prevalence of HBV (2.4 %), followed by HSV-2 (2 %), and HIV (0.4 %). No woman tested positive for syphilis and multiple infections. All the infections were more common in illiterate, multigravida, monogamous women of low socio-economic status. High-risk sexual behavior of the husbands, history of STIs in husbands, and blood transfusions were the other factors associated with the prevalence of these infections.
Conclusions The relatively high prevalence of HBV and HSV-2 infections in asymptomatic pregnant women suggests that there is need of screening for HBV and HSV-2 infections along with the pre-existing screening for HIV and Syphilis and universal immunization of HBV high-risk infants.

Keywords Asymptomatic pregnant women · HSV-2 · HBV · HIV · Syphilis

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Introduction

The prevalence of sexually transmitted infections (STIs) in India is estimated to be 6 %, and about 40 % of women have STIs at any given point of time. Among pregnant women, STIs are associated with a number of adverse pregnancy outcomes including spontaneous abortions, stillbirth, prematurity, low birth weight, postpartum endometritis, and various sequelae in surviving neonates [1]. The management of a significant proportion of these infections is difficult and complicated because they run a long, latent, and insidious course, remain inapparent or asymptomatic, and cannot be initially detected clinically. There are no screening programmes for the detection of STIs in asymptomatic pregnant women even in our tertiary level hospitals [2]. As there is paucity of data on the prevalence of these infections in these women which may differ in geographically disperate regions and is important for designing STI/HIV control programs, the present study

was undertaken to determine the current prevalence of some of the important STIs (HIV, Hepatitis B, herpes simplex virus type 2 (HSV-2), and Syphilis) in asymptomatic pregnant women of Amritsar (Punjab).

Materials and Methods

A total of 500 consecutive apparently healthy, asymptomatic pregnant women, who had history of normal obstetric performance and were attending the antenatal clinic of the Obstetrics and Gynecology Department from October 2004 to February 2006, were screened for HIV, Hepatitis B Virus (HBV), herpes simplex virus type 2, and Syphilis infections. Information regarding demographic, social, and behavioral characteristics, and obstetric performance was recorded, and blood samples were collected after obtaining their informed written consent. Screening for HIV antibodies was performed as per NACO guidelines; HBV infection was diagnosed by detecting Hepatitis B surface antigen (HbsAg) by ELISA (Hepalis; J. Mitra & Co. Ltd); and seroreactivity was performred for HSV2-IgM using ELISA test kit (ENZYWELL-Herpes Simplex2 IgM; DIESSE. Italy). Serological diagnosis of syphilis was done using VDRL and TPHA tests. The χ^2 test was used for statistical analysis.

Results

Table 1 shows that, of the 500 women included in the study, 80.8 % were in the age group of 21–30 years, 65.2 % had urban background, and 76 % had education up to the 5th grade or more. Majority of them (59.2 %) belonged to low socio-economic status and were housewives (61.2 %). Multigravida was more (58.2 %) than primigravida (41.8 %). No woman gave history of promiscuous sexual behavior or intravenous drug abuse by herself. However, 7 % (35/500) reported the presence of such behavior and STIs in their husbands 2 % (10/500).

On the whole, 24 of 500 (4.8 %) women were found to be positive for one or other of these four infections with no case of multiple infections. The highest prevalence was that of Hepatitis B (2.4 %) followed by HSV-2 (2 %) and HIV (0.4 %). No woman tested positive for Syphilis.

Study of the various factors in relation to HBV infection showed that the infection was significantly more prevalent in women having low literacy rate ($p = 0.0015$) than those having education up to the 5th grade or more (Table 1). Other high-risk factors observed in HbsAg-positive women were history of blood transfusion (6/12; 50 %) and high-risk sexual behavior of the husband (8/12; 66.6 %). No one was immunized against HBV infection. Presence of IgM antibodies to HSV-2 in 10 of the 500 (2 %) women

Table 1 Prevalence in relation to various socio-demographic factors

S. No	Socio-demographic factors	No of women 500	HIV +ve cases 2(0.4)	Hepatitis B +ve cases 12(2.4)	HSV-2 +ve cases 10(2)	Syphilis +ve cases Nil
1	Age (years)					
	<20	61 (12–2)	–	2 (3.3)	–	
	21–30	404 (80.8)	2 (0.5)	10 (2.5)	9 (2.2)	–
	>30	35 (7)	–	–	1 (2.9)	
2	Geographic distribution					
	Urban	326 (65.2)	2 (0.6)	5 (1.5)	7 (2.14)	–
	Rural	174 (34.8)	–	7 (4.02)	3 (1.7)	
3	Education					
	<5th Grade	120 (24)	2 (1.7)	8 (6.7)	5 (4.2)	–
	≥5th Grade	380 (76)	–	4 (1.05)*	5 (1.3)	
4	Socio-economic status					
	Low	296 (592)	2 (0.67)	8 (2.7)	5 (1.7)	–
	Middle	165 (33.4)	–	3 (1.8)	4 (2.4)	
	Upper	37 (7.4)	–	1 (2.7)	1 (2.5)	
5	Gravida					
	Multi	291 (58.2)	2 (07)	8 (2.7)	8 (2.7)	–
	Primi	209 (418)	–	4 (1.9)	2 (0.9)	

Figures in parenthesis represent percentage

* $p = 0.0015$ (Significant)

demonstrated that these women had primary/first episode of HSV-2 infection during pregnancy and it was asymptomatic. There was no statistically significant association of the IgM HSV-2 positivity to the various socio-demographic factors. Both the HIV positive women of our study were in the age group of 21–30 years, urban, illiterate, had low socio-economic status, and were monogamous and multigravida. Husbands of both of them were laborers, and they also tested positive for HIV. These women were neither aware of their own HIV status nor that of their husbands.

Discussion

Most of the published data on STIs among pregnant women is related to those having symptoms of STIs and/or bad obstetrical history [2, 3]. In our series, 500 asymptomatic pregnant women were studied, and overall prevalence of any one of the four infections (HIV, HBV, HSV-2, and Syphilis) was 4.8 %. A multicentric study reported prevalence of 7.4 % in any one of the five infections (HIV, HBV, Syphilis, Chlamydia, and Gonorrhea), and only half of them had clinical signs and/or symptoms [2]. This implies that syndromic approach which is used to manage STIs in pregnancy in our country is notoriously poor in identifying high proportions of infections in asymptomatic pregnant women as observed by other workers too [2, 3].

In the present study, positivity for HBV (2.4 %) was the highest. This is in agreement with the 2.6 % carrier rate of HBsAg reported in a follow-up study of asymptomatic mothers from South India [4]. In a recent study from Delhi, 4.25 % mothers were found to be carriers [5]. These prevalence rates conform to India's status as an intermediate endemicity area, and in an endemic population, vertical transmission is responsible for majority of HBV infections. The presence of HBsAg in the pregnant women does not pose an additional risk for pregnancy, but the infected infants became reservoir of infection, and as adults, they are at risk of developing chronic hepatitis, liver cirrhosis, and hepatocellular carcinoma [6]. Therefore, all the infants born to HBsAg seropositive women need to be given universal infant immunization.

Ten of the 500(2 %) women of our series tested positive for the presence of IgM antibodies to HSV-2. Other authors have reported asymptomatic infection in 0.5–8 % of women depending upon the populations studied [7, 8]. In a study of 779 women attending a STI clinic, 47 % had serological evidence of HSV-2 infection, but only 22 % presented with symptoms of genital herpes. It is critical to recognize that the majority of mothers of infants with neonatal HSV do not have a history of HSV [6]. Detection of HSV-2 infections would facilitate counseling of the pregnant women regarding therapy, risk of recurrences, and appropriate measures to reduce HSV-2 infection to their offsprings and contacts [8].

The HIV prevalence in antenatal women attending public hospitals in different states of India varies from 0 to 2 %, and Punjab is an area of low level epidemic (prevalence rate <1 %) [9]. Our result of 0.4 % seropositivity is in accordance with the same and almost similar to the finding from Chandigarh where no woman was found to be HIV positive [2]. Pregnancy does not have any adverse impact on the course of HIV infection, and cases of AIDS represent only a fraction of population infected with HIV. However, asymptomatic HIV-infected women transmit the infection to their offsprings, and mother-to-child transmission is by far the most significant route of transmission of HIV infection in children below the age of 15 years. With more and more pregnant women testing positive for HIV and perinatal transmission rate of 15–40 %, pediatric AIDS is becoming a major public health problem in India [10]. Timely detection of HIV infection and use of antiretroviral therapy along with the knowledge to avoid contracting the infection could help in curtailing this problem.

In the present series, no woman tested positive for Syphilis. In the study of Datey et al., the overall prevalence of Syphilis from five different centers of study was 1 %, and the prevalence was the lowest (0.3 %) at Chandigarh and Calcutta [2]. Although the seroprevalence of syphilis in pregnancy is low, it is a recognized cause of fetal loss. Proper treatment and antenatal care of the VDRL-reactive women would help in achieving successful pregnancy outcome.

Among the various STIs, the prevalence pattern of Syphilis and herpes genitalis is pivotal. This is because HSV-2 infection has an important role in the spread of HIV infection, and in a pregnant, HIV-infected women, it may be a risk factor for perinatal HIV transmission [11]. A number of studies in the recent past have demonstrated a strong association between HSV-2 seropositivity and positive HIV and syphilis serology [3, 8]. However, no such association was observed in the present study. This could be because of a very different set of population (asymptomatic pregnant women) studied, which showed relatively low prevalence of these infections and the sample size studied was also small.

Similar to the studies conducted in other parts of our country, low literacy status, high-risk sexual behavior, history of STIs in husbands, and blood transfusions were found to be associated with increased prevalence of STIs in our study [2, 5, 9]. In the present study, STIs including HIV/AIDS were more common among married monogamous women. This is similar to another report from North India (Punjab) [12]. Women in monogamous relationship are placed at the risk for infection when their husbands engage in high-risk sexual activity. The vulnerability of

women is also due to inadequate knowledge about STIs, insufficient access to prevention services, inability to negotiate safer sex, and lack of female-controlled prevention method.

The present study thus concludes that along with antenatal screening of syphilis and HIV, there is an urgent need for developing suitable screening strategies for HBV and HSV-2 infections for asymptomatic pregnant women and universal immunization of HBV high-risk infants. In addition, greater emphasis should be laid on targeted interventions of prevention services through information, education, and promotion of women's right. This would go a long way in reducing the spread of STIs in pregnant women and its associated perinatal mortality and morbid.

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