Seropositivity rates for toxoplasmosis, rubella, syphilis, cytomegalovirus, hepatitis and HIV among pregnant women receiving care at a Public Health Service, São Paulo State, Brazil

ABSTRACT

Infectious and parasitic diseases affecting women during their reproductive age may result in vertical transmission. The aim of this study was to determine the seroprevalence for TORSCH among pregnant women receiving care at a university hospital. Records of 574 pregnant women who received medical attention from January 2006 to December 2007 were assessed. The mean age was 27.2 ± 6.5 years ranging from 13 to 44. The results of the immunodiagnostic tests were: 62.0% (345/556) for IgG and 3.4% (19/556) for IgM anti-*T. gondii*; 93.1% (433/465) for IgG and 0.6% (3/465) for IgM anti-rubella; 0.9% (5/561) for VDRL; 1.8% (10/554) for HBsAg; 0.7% (4/545) for anti-HCV and 2.1% (11/531) for HIV. In conclusion, the results of immunodiagnostic tests for the TORSCH panel among pregnant women attending a perinatal service of a university hospital are in agreement with those reported by previous studies and by governmental sources.

Keywords: toxoplasmosis; rubella; infectious disease transmission; vertical; pregnancy complications; infectious; hepatitis.

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INTRODUCTION

Infectious and parasitic diseases affecting pregnant women are a potential public health problem, as they may cause congenital abnormalities or be vertically transmitted.[1,2] The prevalence rates of these diseases are frequently associated with the pregnancy period. The risks are associated with their higher rates in less well educated populations.[3] Knowledge of the prevalence and incidence of these infectious-parasitic diseases in pregnant women is of great importance in the planning of maternal-fetal health programs strategies, screening and treatment of these diseases.[4]

Serological tests to diagnose infections of the TORSCH (Toxoplasmosis, Rubella, Syphilis, Cytomegalovirus, Hepatitis B and C, and HIV) are mandatory, as they pose a potential life threatening risk for the pregnant woman and their fetus, in addition to the newborn baby after delivery.[3,4] With the exception of infections by cytomegalovirus, the other diseases are routinely investigated in all pregnant women attending the high-risk pregnancy and fetal medicine unit of Hospital de Base (FUNFARME) in São José do Rio Preto, a reference center for the northwest region of São Paulo State.

Few studies have assessed the prevalence of the TORSCH infections among pregnant women in Brazil. In the north of Paraná State, rates of 67.0% (IgG-toxo), 1.8% (IgM-toxo), 89.0% (IgG anti-rubella), 1.2% (IgM anti-rubella), 1.6% (syphilis), 0.8% (hepatitis B), 0.8% (hepatitis C) and 0.6% (HIV) were reported in one study.[3] In the state of Mato Grosso do Sul, the percentages were 0.4% for IgM-toxo, 0.03% for IgM anti-rubella, 0.8% for syphilis, 0.3% for hepatitis B, 0.1% for hepatitis C and 0.2% for HIV.[4]

Recent studies with pregnant women in the northwest region of São Paulo State reported IgG-toxo antibodies in 64.1%[5] and 1.03% of HIV seropositivity,[6] but did not detail the results of other TORSCH infections. The aim of this study was to assess the prevalence of infections of the TORSCH group among pregnant women attending a university hospital.

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We declare no conflict of interest.

MATERIAL AND METHOD

Ethical considerations

This study was approved by the Research Ethics Committee of the São José do Rio Preto Medical School (FAMERP – protocol 168/2007). The need for a written consent of patients was waivered as all the data were retrospectively collected from the patients' hospital records.

Selection of patients' records

A total of 624 hospital records of pregnant women who had attended the high-risk pregnancy and fetal medicine unit of Hospital de Base (FUNFARME) in São José do Rio Preto from January 2006 to December 2007, were included. Of these, 574 who had records with the necessary data to be retrieved for the proposal of this work were selected.

Data collection

Data were collected from records through an epidemiological form and later transferred to a Excel spreadsheet (version 2003).

Statistical analysis

The GraphPad Instat software version 3.06 was employed to calculate the rates of seropositivity for the tested infections. The chi-squared test was used to compare proportions; a level of significance of 0.05 was considered statistically significant.

RESULTS

The mean age selected pregnant women was 27.2 ± 6.5 years ranging from 13 to 44 years.

Table 1 shows the seropositivity rates for the TORSCH International protocol, with the exception of cytomegalovirus (CMV). As this test is not mandated by the Brazilian Health Ministry it is not performed at our institution.

Table 1. Seropositivity rates of toxoplasmosis IgG and IgM, rubella IgG and IgM, syphilis, hepatitis B, hepatitis C and HIV in pregnant women attending the Gynecology and Obstetrics Outpatients Clinic of Hospital de Base (FUNFARME) in São José do Rio Preto, São Paulo State, Brazil from January 2006 to December 2007

Test	n	Seroreagent	%
Toxoplasmosis			
IgG	556	345	62.0
IgM	556	19	3.4
Rubella			
IgG	465	433	93.1
IgM	465	3	0.6
Syphilis	561	5	0.9
Hepatitis B (HBsAg)	554	10	1.8
Hepatitis C (anti-HCV)	545	4	0.7
HIV1/2	531	11	2.1

Detailed information of the serological test results for toxoplasmosis was available for 556 pregnant women. The mean age of the pregnant women with risk of congenital transmission (n = 230; non-reagent [IgG and IgM] and reagent serology for IgG + IgM) was 26.3 ± 6.6 years and for those without risk (n = 326; reagent serology for IgG) it was 27.8 ± 6.4 years (p = 0.005).

Out of 465 women with available anti-rubella serological results, the mean age of pregnant women with risk of congenital transmission (n = 35; non-reactive serology [IgG and IgM] and reactive serology for IgG + IgM) was 28.9 ± 7.4 years and 27.1 ± 6.6 years for those without risk (n = 430; serology reactive for IgG; p = 0.11).

For syphilis, the mean age of the seropositive pregnant women was 19 ± 4.2 years and 27.2 ± 6.5 years for the seronegative women (p = 0.004).

The mean ages of pregnant women with and without HBsAg antigen were 25.3 ± 8.1 and 27.1 ± 6.5 years, respectively (p = 0.37). In respect to hepatitis C, the mean ages were 31.7 ± 4.2 for seropositive women and 27.1 ± 6.5 years for seronegative women (p = 0.15).

In relation to serology for HIV, the mean age of seropositive pregnant women was 30.7 ± 5.4 years and 27.1 ± 6.6 years of seronegative women (p = 0.07).

DISCUSSION

The aim of this study was to determine the prevalence of seropositive immunodiagnostic tests of the TORSCH panel group in 574 pregnant women attending a university hospital in the northwest region of São Paulo State. Results of this cross-section study are representative of the population from the northwest region of São Paulo State. The observed mean age of the pregnant women was in line with a previous study reporting results of women from the same region.[6]

In the present study more than 60% of the pregnant women tested positive for IgG anti-*T. gondii* antibodies, which is in agreement with other studies carried out in Brazil reporting seropositivity rates ranging from 22.8% to 71.5%.[7-12] Two recent studies performed in the northwest region of São Paulo State found rates similar to those reported in the current study.[5,13]

Pregnant women at risk of congenital transmission of toxoplasmosis were younger than those without risk. Most humans tend to produce high-avidity anti-*T. gondii* IgG antibodies following infection with *T. gondii* as a result of the development of immune memory.[14,15] Additionally, older individuals seem to be exposed to a greater number of stimuli including re-infections by this parasite, without necessarily manifesting the clinical form of the disease.[15] Thus, we can presume that the majority of seropositive pregnant women are probably immune and with no risk of congenital transmission of *T. gondii*.

On the other hand, seronegative pregnant women or those seropositive for IgG and IgM are at risk of transmission and adequate precautions need to be taken.

Serology for rubella was performed in fewer cases, although more than 93% of the pregnant women presented with evidence of immunization with reactivity for IgG.

In several countries, including Brazil, vaccination campaigns against rubella in women have contributed to the reduction of acute cases of the disease thereby protecting susceptible patients and their fetuses.[16,17] This strategy of increasing the immunization rates is translated in the high rates of IgG seropositivity seen in this study.

The percentage of pregnant women at risk for congenital transmission of rubella was lower than 1% and the mean age of these individuals was not significantly different from those without risk. The last vaccination campaign against rubella carried out in Brazil was aimed at women in reproductive age, i.e., between 12 and 39 years old.[18] This may explain, at least in part, the lack of differences in the mean ages of pregnant women with and without risk for congenital transmission.

The positivity rate for VDRL in this study (0.9%) was lower than that reported in other publications.[19,20] Adolescence is a phase of life in which the risk of acquiring sexually transmitted diseases is higher. In a study performed in the state of Pará, it was observed that 15% of the mothers who gave birth to a baby with syphilis were younger than 20 years old.[21,22] These data support the results of the current study that also found a lower mean age among pregnant women with positive serology for VDRL. Congenital syphilis is preventable; control measures adopted in Brazil aim at reducing the number of cases to 1 in 1,000 newborns.[20]

The age of pregnant women with and without reactive tests for hepatitis B was similar and the rate of HBsAg positivity (the surface antigen of the hepatitis B virus) was within the range for persistent infection by HBV reported in Brazil. Studies performed in several states have demonstrated frequencies ranging between 0.3% and 13%, including among pregnant women.[3, 23-25]

Previous knowledge of the serological test results for hepatitis B in pregnant women is of extreme importance as the risks of congenital transmission increase with maternal viral load. This disease should receive constant attention in pregnant women, as infected newborn babies present a high risk of developing chronic forms of the disease due to their immunological immaturity.[24, 26, 27]

The frequency of anti-HCV antibodies found in this study is lower than that reported in the general population,[28,29] but is close to that observed in pregnant women.[30,31] Moreover, pregnant women, with and without seropositivity had similar mean ages.

The hepatitis C virus is responsible for more than 90% of the hepatitis previously classified as non-A and non-B,[32] with the great majority of infected individuals remaining asymptomatic.[33] This is of great importance, as pregnant women, even when asymptomatic, can transmit the virus to their fetuses and newborn babies.

The HIV-infection rate found in this study is elevated and may be related to the High-Risk Gestation Outpatient Clinic being a regional reference center and that São José do Rio Preto is a reference center for the treatment of sexually transmitted diseases including AIDS.[34] The mean ages of the pregnant women with and without anti-HIV antibodies were similar.

In Brazil, the National HIV/AIDS Program has involved city and state governments, as well as non-governmental organizations, in the fight against HIV/AIDS for more than two decades. By means of an epidemiological surveillance the National Program keeps track of temporal and spatial trends in the occurrence of AIDS and HIV infection, aiming at guiding control actions of the epidemic at every level of public healthcare (SUS).[35] Heterosexual transmission of HIV increased the number of infected women throughout the world, including in Brazil, thus raising the number of cases of children with AIDS due to perinatal and transplacental transmission.[23, 36, 37]

The rate of vertical transmission of HIV, with no intervention, is about 25%. However, several studies have demonstrated a drop in transmission to 0% to 2% and a significant reduction in the incidence of cases of AIDS in children, as a result of preventive measures such as the use of combined anti-retroviral agents, elective C-sections, the use of chemoprophylaxis with AZT in the perinatal period and restricting breastfeeding in the newborn.[38-40]

The results of this study underscore the importance of diagnosing congenitally and perinatally transmitted infectious-parasitic diseases for the health of pregnant women and their newborn babies, in agreement with prior publications.[3,20,41] Early diagnosis allows preventive measures and treatment to be implemented in the antenatal and postnatal periods.[3,4,41,42]

CONCLUSIONS

In conclusion, the prevalence of the TORSCH group infections in pregnant women attending a teaching hospital are in agreement with those previously reported by epidemiological studies and by government sources.

ETHICAL APPROVAL

This study was approved by the Research Ethics Committee of the Medicine School in São José do Rio Preto (FAMERP – protocol 168/2007).

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