

Original Research Article

Incidence of nontreponemal positive test in women at childbirth in a maternity in the central region of Rondonia state, Brazil

ABSTRACT

Aims: This study aimed to analyze the incidence of syphilis and congenital syphilis in a maternity in the city of the Ji-Paraná and compare it with official data provided by the Brazilian government.

Study design: An analytical, cross-sectional, prospective study.

Place and Duration of Study: Department of Pharmaceutical Sciences (CEULJI/ULBRA) and public maternity of the Ji-Paraná, between August 2 to October 2, 2014.

Methodology: We randomly investigated a total of 300 pregnant women at childbirth. When VDRL test was positive a semi-structured interview was administered. The data obtained were compared with secondary data provided by DATASUS (www.datasus.gov.br).

Results: A total of 50,657 cases of syphilis were reported in Brazil from 2005 to 2011. The highest incidence was in 2011 (5 cases per 1000 live birth) and the lowest in 2006 (0.3 cases per 1000 live birth), with an average of 7,237 cases per year. In 2007, a major change was observed in the incidence rate. Regarding CS a total of 45,683 cases were reported in the same period. The highest incidence was in 2011 (3.3 cases per 1000 live birth) and the lowest in 2005 (1.9 cases per 1000 live birth), with an average of 6,526 cases per year. We found 5 women (16.6 per 1000 live births) with VDRL positive tests, however only one newborn, whose mother did not perform prenatal or therapy care, had a significant serology titration according Brazilian diagnostic guidelines. Diagnosed women in this research were all adults with an average mean of 21.8 ± 2.8 years, with basic education, in stable union, and low income.

Conclusion: The results found in this study show that Brazilian Unified Health System is far from the established goal for 2015 and strongly suggests that it may not be reached.

Keywords: *Congenital Syphilis; Venereal Disease Research Laboratory (VDRL); Unified Health System (SUS); Childbirth; Brazil.*

1. INTRODUCTION

Syphilis is an infectious disease transmitted by the spirochaeta *Treponema pallidum* in a systemic way; manifested by cutaneous form with chronic disease evolution [1]. Considered a Sexually Transmitted Disease (STD), when untreated or treated improperly, evolves compromising the skin, internal organs and central nervous system. This disease still being a problem related to public health, especially in developing countries. The World Health Organization (WHO) estimated that in 2008, 12 million people, including about two million pregnant women were infected with *T. pallidum*. In addition, there is an increasing trend in the incidence of syphilis and congenital syphilis (CS) worldwide [2,3].

CS is due to the transmission and hematogenous dissemination of *T. pallidum* of pregnant women untreated or treated inadequately to the fetus through the placenta. When the disease is contracted in the first 6 months of pregnancy, vertical transmission in untreated

women range from 70 to 100% of the cases, and approximately 30% of the cases for infection after the 6th month of pregnancy [3-8].

Pregnant women during prenatal and birth, in places funded by the Brazilian Unified Health System (SUS), must perform the screening for syphilis in pregnancy, through the nontreponemal test (VDRL - Venereal Disease Research Laboratory) in the first prenatal medical appointment, in the third trimester of pregnancy, and at childbirth or curettage [6-8].

Until the year 2013 the nontreponemal test VDRL was used for CS screening, therapeutic follow-up and control. After this date, the rapid treponemal test was introduced, but it is currently not available in all country regions. Laboratory confirmation with treponemal tests, even though being decisive is not mandatory [4,6,9-11]. In cases of the mother being diagnosed with syphilis, the newborn must be submitted to the VDRL test, if the result is positive, with clinical evidence or not, the treatment should proceed according to WHO guidelines [6,4,2].

In this context, considering that this disease is still a challenge in Brazil, this study aimed to analyze the incidence of syphilis and CS in a maternity in the city of the Ji-Paraná and compare with official data provided by the Brazilian government.

2. METHODS AND MATERIALS

2.1 Ethical Approval

Ethical approval was obtained from the university Research Ethic Committee. Written authorization from the maternity administration was also obtained as well as individual written consent of each participant of the study.

2.2 Study area

This study was conducted in the city of Ji-Paraná, Rondônia, Brazil, located in the North region of the country (Geographic coordinates: 10°53'07" S - 61°57'06" W). The estimated population for the year 2014 is about 129,242 inhabitants and the Human Development Index (HDI) is 0.714, according to the census of the Brazilian Institute of Geography and Statistics (IBGE) in 2010. The maternity of the public Hospital was chosen because it serves the majority of women in the central area of the State.

2.2 Study Design

An analytical, cross-sectional, prospective study with qualitative and quantitative approach was carried out in a two-month period from August 2 to October 2 in 2014.

2.3 Sources of Data

2.3.1 Epidemiological data

This study used secondary data obtained from DATASUS (www.datasus.gov.br). The database includes only confirmed cases of syphilis and congenital syphilis reported in the Notifiable Diseases Information System (SINAN) in the period from 2005-2011. Population statistics were extracted from the Brazilian Institute of Geography and Statistics (www.ibge.gov.br).

2.3.2 Data collection

2.3.2.1 Sample method

In a randomized controlled method we investigated 300 pregnant women attending the public maternity for childbirth. Data collection was performed every day of the week during the study period, regardless of childbirth type (natural or C-section).

2.3.2.2 VDRL Test

Blood samples of all participants were obtained by peripheral venous puncture, collecting 3 mL of mother's blood. Newborn blood sample were collected for VDRL test only when the mother was protein serum reagin. All investigations were carried out according to manufacturers' instructions. VDRL test (Record N^o.10009010223; Labtest Diagnostica SA, Lagoa Santa, MG, Brazil) in newborn was considered significant when the titration was at least four times mother titration [6].

2.3.2.3 Interviews

A semi-structured interview was administered for collection of demographic and clinical information in women with positive VDRL test.

3. RESULTS AND DISCUSSION

3.1 Epidemiological distribution

A total of 50,657 cases of syphilis were reported in Brazil from 2005 to 2011. The highest incidence was in 2011 (5 cases per 1000 live birth) and the lowest in 2006 (0.3 cases per 1000 live birth), with an average of 7,237 cases per year. In 2007, a major change was observed in the incidence rate (Fig. 1). Regarding CS a total of 45,683 cases were reported in the same period. The highest incidence was in 2011 (3.3 cases per 1000 live birth) and the lowest in 2005 (1.9 cases per 1000 live birth), with an average of 6,526 cases per year (Fig. 2). Since 2005, the Brazilian Ministry of Health considers syphilis a notifiable disease and, previous works have reported flaws in the notification mechanism, and is known that the disease frequency is higher than shown by official data [6,8].

The WHO [21] estimated that developing countries had between 10 and 15% of pregnant women infected by *T. pallidum*. Research works on syphilis in Brazil reported that each year about three million women give birth and syphilis prevalence rate is estimated in 1.6%, corresponding to approximately 49,000 infected women and 12,000 live births with CS [12-15,3]. The discrepant findings of syphilis in different regions of the country reflected the differences in structuring, monitoring, investment in campaigns, and treatment availability. Brazil has a huge deficiency in healthcare, mainly in Northeast and North regions. Epidemiological data provided by the maternity facility where the study was carried, showed that only two cases of CS were confirmed in 2012. Another research work in a hospital in Brazil found that, out of 28 cases of CS, only 10 were reported. It was noticed an obvious inconsistency of data, due to underestimation or overestimation periods [16].

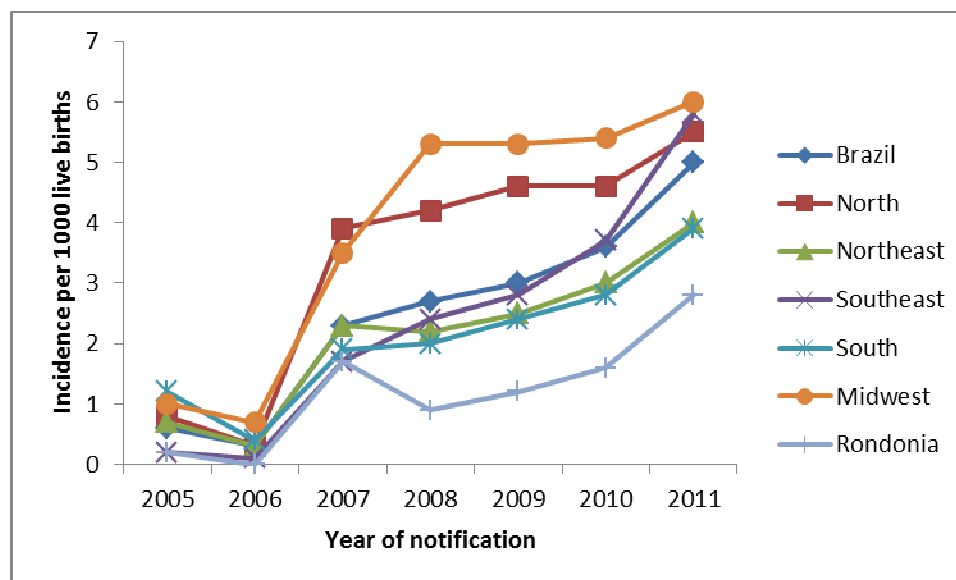


Fig. 1. Incidence of syphilis in pregnant women per region and year, Brazil, 2005 – 2011

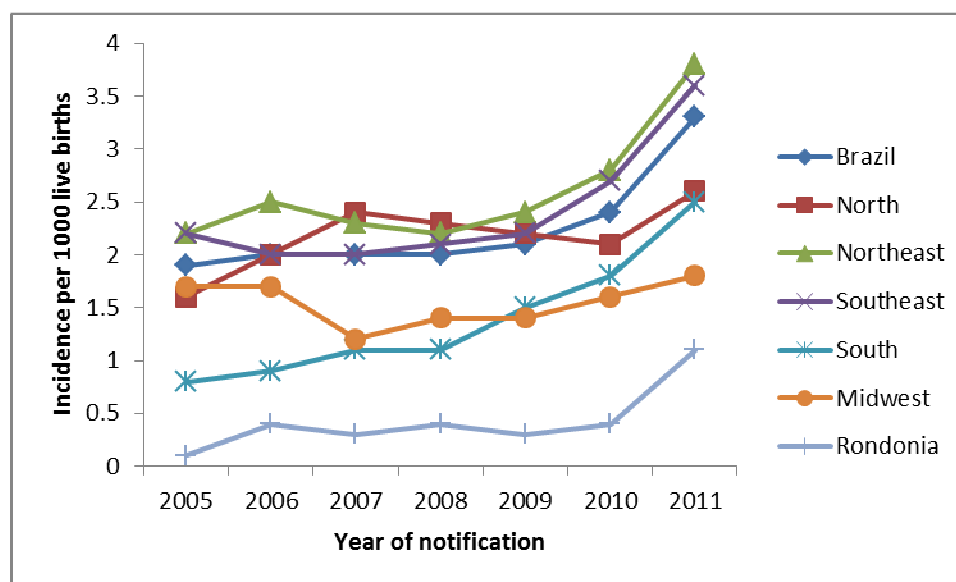


Fig. 2. – Incidence of congenital syphilis in children with less than one year of age per region of residence and year of diagnosis, Brazil, 2005-2011.

3.2 VDRL test

We analyzed 300 pregnant women in this study, and in 98.33% of the cases VDRL tests were non-reagents. Table 1 presents the risk factors for the diagnosis of CS. In the interviews we found that four women have had prenatal care and only one discovered syphilis in the childbirth VDRL test.

Similar works have shown that the chance of a child being diagnosed with CS is higher when children are born from brown or black mothers without prenatal conduct which points out

social inequality as a relevant factor for contagion [17]. In the interviews, we noted that patients had some knowledge on STDs, however they were unaware of the risks associated with such diseases. Among the five pregnant women, only three reported to have knowledge about STDs upon initiation of sexual activity through lectures and/or radio. Lack of knowledge and prenatal care were reported to be intrinsically associated with CS, the need to improve this care is evident [18-21]. Adolescence is a risk factor for syphilis [30], but mothers in this research were all adults (aged 18-25 years, average = 21.8±2.8). Studies have observed a correlation between positive VDRL in young women with low education and low income [18,21].

Out of five women with protein serum reagin, four had stable partners; only one of them was married. Syphilis have been reported to be more common in single women with active sex life [3].

Table 1. Profile of patients positive for VDRL

Variables	Woman 1	Woman 2	Woman 3	Woman 4	Woman 5
Age	20	22	25	18	24
Color	White	Brown	White	Brown	White
Marital status	Stable union	Married	Stable union	Stable union	Stable union
Education	Basic	High School	Basic	Basic	Basic
Income ¹	234.50	469.00	> 234.50	234.50	469.00
Number of pregnancy	2	2	2	1	1
Age of 1 st sexual relationship	17	18	17	15	18
Used condom?	No	No	No	No	No
Number of sexual partners	2	3	1	2	2
If condom is always used	No	Sometimes	No	Sometimes	No
Knowledge about STD	Yes	Yes	No	No	Yes
Communication method	Lecture	Radio	-	-	Radio
When syphilis was diagnosed?	Prenatal care	Prenatal care	Pre childbirth	Prenatal care	Prenatal care
If during pregnancy, which trimester?	1 st	2 nd	3 rd	2 nd	1 st
Medical treatment	Yes	Yes	No	Yes	Yes

The results of serological tests were reported in Figure 3. We found that only the newborn from Woman 3, who did not perform prenatal or therapy, had significant serology titration (1:16) associated with syphilitic characteristics. Previous works have shown that titrations (1:02) should be considered since neonates may be in immunologic window period in which low titrations occur, even false negative or false positive due to the presence of maternal antibodies and/or cross-reactivity [22-25].

¹ US\$ per month

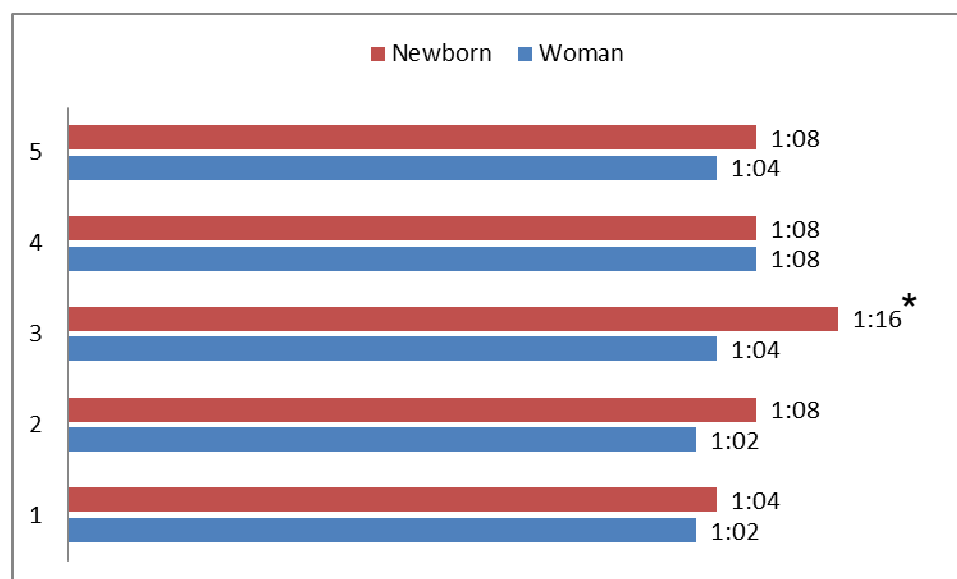


Fig. 3. Patients' titration. *Significant value according Brazilian Ministry of Health.*

The Brazilian Ministry of Health, had joined efforts to eradicate syphilis in Brazil. The official goal was set to reach eradication (0.5 cases per 1000 live births) in 2015. As can be seen in Figure 01, the number of reported cases had actually increased in 2011, signaling that the goal may not be reached. In order to eradicate the disease, the government had intensified awareness campaigns and the treatment programs, as well as improved the notification system. In a first analysis such actions seems to have negative effect. Our result of 16.6 cases per 1000, of infants is alarming. It suggests a huge flaw in the notification system, as previously reported [8]. Also, the increasing in number of cases after the beginning of the eradication program suggests that more cases than before are being notified and that syphilis in Brazil is a bigger problem then initially thought.

4. Conclusion

Although strategies for eliminating vertical transmission in congenital syphilis are being focused on the prenatal care period, it is evident that their implementation is different in the different regions of Brazil. Questions such as the proper training of health professionals, the re-orientation of control actions of the public healthcare network in the benchmark of health surveillance, and in the application of the legal instruments being prepared, mainly in the study period, have become a challenge.

CONSENT

All authors declare that "written informed consent" was obtained from the patients for publication of this research. The original copies are archived in the Department of Biomedicine, CEULJI/ULBRA.

ETHICAL APPROVAL

The authors have obtained ethical approval from the Research Ethic Committee (CEP-CEULJI/ULBRA: 79.807/2014) and Legal authorization from the Hospital manager.

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