



Syphilis in pregnancy: profile and associated factors in the northwest Region of São Paulo State

Sífilis na gravidez: perfil e fatores sociodemográficos associados na Região Noroeste do Estado de São Paulo

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ABSTRACT

Brazil is undergoing an epidemic of syphilis. In the pregnancy-puerperal cycle, syphilis has a high incidence and is considered a public health problem. This study aimed to perform the temporal and incidence analysis of gestational and congenital syphilis cases in 28 municipalities in the northwest region of the state of São Paulo. This was an observational, epidemiological, ecological study carried out with secondary data collected between 2010 and 2017 in public databases of SINASC and SINAN. The reported cases of gestational/congenital syphilis were described according to sociodemographic variables and chi-square association tests were applied at a significance level of 5%. There were 350 cases of gestational syphilis and 164 cases of congenital syphilis; the average vertical transmission rate was 44.09%; partners had low adherence to treatment; and 86.59% pregnant women attended prenatal care. It can be concluded that vertical transmission rate of syphilis is high, and few partners of pregnant women adhere to the treatment.

Keywords: Prenatal care. Syphilis, Congenital. Syphilis.

RESUMO

O Brasil está enfrentando uma epidemia de sífilis. No ciclo gravídico-puerperal, a sífilis possui grande incidência, sendo assim considerada um problema de saúde pública. Este trabalho teve como objetivo realizar a análise temporal e de incidência dos casos gestacionais e congênicos de sífilis em 28 municípios da região noroeste paulista. Trata-se de um estudo observacional, epidemiológico e ecológico desenvolvido com dados secundários coletados entre 2010 e 2017 nas bases públicas do SINASC e SINAN. Os casos relatados de sífilis gestacional/congênita foram descritos conforme as variáveis sociodemográficas, e testes de associação qui-quadrado realizados ao nível de significância de 5%. Encontraram-se 350 casos de sífilis gestacional e 164 casos de sífilis congênita; a taxa média de transmissão vertical foi de 44,09%; parceiros tiveram baixa adesão ao tratamento; e 86,59% das gestantes fizeram pré-natal. Conclui-se que a taxa de transmissão vertical da sífilis é alta, e poucos parceiros de grávidas aderem ao tratamento.

Palavras-chave: Cuidado pré-natal. Sífilis. Sífilis congênita.

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INTRODUCTION

Cases of syphilis represents a public health problem with rising rates in several countries¹⁻³ guidelines and international documents related to the detection of syphilis in pregnant women and congenital syphilis. Method: Two algorithms were developed based on the standard of female care during pregnancy and on the standard for prevention and control of sexually transmitted infections. Based on the Centers for Disease Control (CDC and in Brazil the scenario is not different. Since 2014, the number of infected individuals has increased by 32.7%, and infection rates grew from 2.1 to 7.4 per 100 thousand inhabitants between 2000 and 2015. Between 2016 and 2017, the number of infected patients increased by 48%⁴. The main factor associated with this elevation is the non-use of condoms.⁵ Syphilis is considered a disease with low symptomatology, which often results in a late diagnosis. These features can also be observed in other sexually transmitted infections, such as Aids, HPV, and hepatitis⁵.

Syphilis is a systemic, infectious, contagious disease, with a chronic evolution, caused by the bacterium *Treponema pallidum*. Its transmission can occur via sex, mother-to-child during pregnancy⁶, and blood. The Brazilian Ministry of Health provides mechanisms for disease control between pregnant women and their partners: screening, diagnosis, and effective treatment of the disease⁷. However, cases have continued to increase^{6,8}.

Syphilis is considered a public health problem, with great incidence in the pregnancy-puerperal cycle^{9,10}. Mother-to-child transmission can cause several sequelae for the newborn, including oral problems¹¹. According to the Brazilian Ministry of Health¹², the congenital syphilis incidence is between 70 and 100% depending on the stage of infection and the gestational period. These conditions justify the necessity of two moments for diagnostic testing during pregnancy (first prenatal appointment and last trimester) and at hospital admission (for either childbirth or uterine curettage, in cases of miscarriage). Syphilis test at the beginning of the third

trimester allows for maternal treatment up to 30 days before birth, which is the minimum term required to treat fetuses in the uterus⁷.

Nevertheless, sexual partners of pregnant women are a key factor in the treatment. They must be treated concomitantly, otherwise the child will be considered a case of congenital syphilis. Considering that syphilis can be successfully controlled through actions and measures carried out by public health programs, by means of sensitive diagnostic tests and effective, low-cost treatment, this study aimed to perform the temporal and incidence analysis of gestational and congenital syphilis cases and its associated sociodemographic factors.

METHODS

This was an observational, epidemiological, ecological study carried out with data collected between 2010 and 2017, from public databases of Brazilian Ministry of Health, in 28 municipalities in the northwest region of the state of São Paulo. The study region was selected based on the municipalities that refer to specialized care in the host city where the researchers of this study work. The period was chosen considering the years in which the data were not composed of still preliminary information.

Data were collected from public systems managed by the Brazilian Ministry of Health: the Live Birth Information System (SINASC – Sistema de Informações sobre Nascidos Vivos) and the Information System for Notifiable Diseases (SINAN – Sistema de Informação de Agravos de Notificação) – both available at the website of the database of the Brazilian Unified Health System (DATASUS – Departamento de Informática do Sistema Único de Saúde).¹³

Databases present the absolute number of cases of maternal and congenital syphilis, and from these data the detection rates for maternal syphilis and incidence rates for congenital syphilis were calculated. These rates were calculated as follows^{3,8}:

$$\frac{\text{Number of new cases of congenital syphilis}}{\text{Number of newborns in the same period}} \times 1000$$

$$\frac{\text{Number of new cases of syphilis in pregnancy}}{\text{Number of newborns in the same period}} \times 1000$$

The reported cases of gestational syphilis were described with variables related to educational level, skin color, and age; and the reported cases of congenital syphilis were characterized with variables related to educational level, skin color, attendance at prenatal care, moment of diagnosis of syphilis, and partner treatment. The “ignored” or “blank” data were not excluded in order to avoid underestimation of data; they were analyzed as a single category for each variable. Association tests (chi-square) between dependent variables (gestational syphilis or congenital syphilis) and sociodemographic variables were performed. Temporal models were used to predict gestational syphilis and congenital syphilis. The temporal analysis was performed using the Prais-Winsten model considering the cases of gestational syphilis and congenital syphilis. This model considers rates as a dependent variable (Y) and for independent variable (X), the year studied, this indicated for trend analysis, since it corrects the temporal autocorrelation

of the residuals, starting from the ecological assumption that the incidences can be influencing each other in the years of the time series¹⁴.

Statistical analyses were applied at a significance level of 5%. Data were obtained exclusively from secondary databases (public database); for this reason, there was no need for approval by the Ethics and Research Committee, in accordance with the current legislation.

RESULTS

In the period analyzed, 350 cases of syphilis in pregnant women and 164 cases of congenital syphilis were diagnosed in the study region. The average mother-to-child transmission rate (vertical transmission) was 44.09%, indicating an evident growth in the period. The rate of syphilis detected in pregnant women had a significant increase (Table 1)

Table 1. Detection Rate of Syphilis in Pregnant Women, Incidence Rate of Congenital Syphilis and Vertical Transmission between 2010 and 2017. 2019

	Cases of maternal syphilis	Cases of congenital syphilis	Vertical transmission rate	Live births	Incidence rate of congenital syphilis ^a	Detection rate in pregnant women ^a
2010	21	12	57.14%	6437	1.86	3.26
2011	24	5	20.83%	6848	0.73	3.50
2012	21	11	52.38%	6854	1.60	3.06
2013	36	6	16.67%	6893	0.87	5.22
2014	46	14	30.43%	7231	1.94	6.36
2015	43	28	65.12%	7294	3.84	5.90
2016	59	31	52.54%	6635	4.67	8.89
2017	99	57	57.58%	7052 ^b	8.08	14.04

a: per 1000 live births.

b: preliminary data

The profile of pregnant women with syphilis demonstrated that 39.43% had complete or incomplete elementary education, 46.29% were white, and 72.79% were between 20 and 39 years old. The variables “educational level”(p <0.05), “skin color”(p <0.05), and “age”(p <0.05) were associated with the outcome “maternal syphilis”. Regarding the profile of mothers whose children had congenital syphilis, 86.59% pregnant women attended prenatal care, 54.32% had incomplete elementary education, and 60.37% were white. There was low

adherence of partners to the treatment against syphilis: 56.71% did not perform it. The disease was most frequently diagnosed (70.12%) during prenatal care. The variables “educational level” (p<0.05), “skin color” (p <0.05), “attendance at prenatal care” (p <0.05), “moment of diagnosis” (p <0.05), and “partner treatment” (p <0.05) were associated with the outcome “congenital syphilis” (Table 2).

Figure 1 illustrates a predicted increase in the number of confirmed cases of maternal and congenital syphilis between 2018 and 2020.

Table 2. Diagnosis and Clinical Classification of Maternal and Congenital Syphilis according to Sociodemographic Factors between 2010 and 2017. 2019

Variables	n	%	p-value
Maternal Syphilis			
Age			
10 to 14 years	5	1.43%	
15 to 19 years	89	25.43%	0.00*
20 to 39 years	253	72.29%	
40 to 59 years	3	0.86%	
Skin Color			
Ignored	11	3.14%	
White	162	46.29%	0.00*
Black	30	8.57%	
Brown	147	42.00%	
Educational Level			
Ignored	91	26.00%	
Incomplete Elementary Education	78	22.29%	
Complete Elementary Education	40	11.43%	0.00*
Incomplete High School	71	20.29%	
Complete High School	67	19.14%	
Higher Education	3	0.86%	
Congenital Syphilis			
Partner Treatment			
Yes	49	29.88%	0.00*
No	93	56.71%	
Not informed	22	13.41%	
Moment of Diagnosis			
Prenatal care	115	70.12%	
Childbirth/Curettage	39	23.78%	0.00*
After childbirth	5	3.05%	
Not informed	4	2.44%	
Not recorded	1	0.61%	
Attendance at Prenatal Care			
Yes	142	86.59%	0.00*
No	18	10.98%	
Not informed	4	2.44%	
Skin Color			
Ignored	16	9.76%	
White	99	60.37%	0.00*
Black	4	2.44%	
Brown	45	27.44%	
Educational level			
Incomplete Elementary Education	54	32.93%	
Complete Elementary Education	22	13.41%	
Incomplete High School	26	15.85%	0.00*
Complete High School	37	22.56%	
Higher Education	2	1.22%	
Not applicable	1	0.61%	

*p<0,05

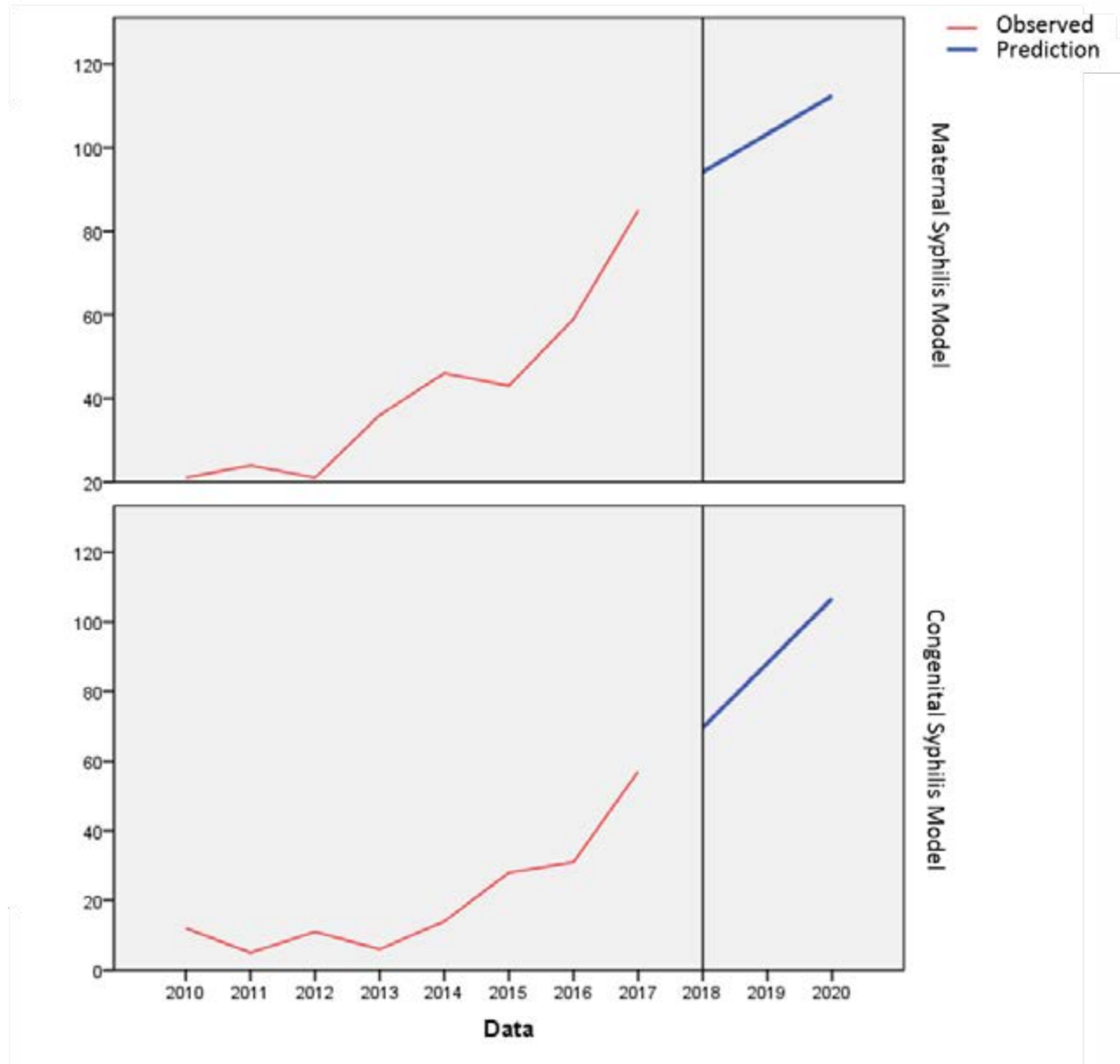


Figure 1. Temporal model of prediction of new cases of gestational and congenital syphilis in the period from 2018 to 2020. 2019.

DISCUSSION

Syphilis is an important indicator of the quality of maternal and child health care, but remains as a public health problem. Despite the government mobilization to improve health care in this regard, the number of confirmed cases of syphilis has considerably increased⁸. In an attempt to restrain this condition, the Brazilian Ministry of Health and international agencies have set goals to reduce this movement^{12,15}. However, data have shown an increase in the incidence rates of syphilis. The Pan American Health Organization as well as a Japan study and a

Brazilian study in Rio de Janeiro also indicated such increase^{2,6,16,17}.

The late start or even the absence of prenatal care is an important factor associated with the development of congenital syphilis³. Although syphilis can be considered a disease with an effective low risk of vertical transmission, relatively simple diagnosis during pregnancy, and easy management in the clinic practice, it is a risk factor for gestation; then, pregnant women should always be referred to specialized care, as described in the Brazilian protocol⁷. However, in a recent document, the Ministry of Health has changed

this guide and now recommend the classification of syphilis as a high-risk factor for gestation, as well as the referral of pregnant women to specialized care only in case of tertiary syphilis with diagnosis of fetal malformation¹⁸. Vertical transmission rates are high for primary and secondary syphilis – from 70% to 100% –, whereas tertiary syphilis affects about 30% children. The incidence rate of vertical transmission of syphilis in the study target population quadrupled in the period studied, despite the improvement in indicators of screening and detection of cases. Thus, timely diagnosis is extremely important for prevention of child sequelae, ranging from dentofacial deformities and neurological deafness to learning difficulties⁷.

Even though the majority of pregnant women have attended prenatal care, a large number of congenital syphilis cases is still diagnosed outside the gestational period. This demonstrates a need for improving the surveillance system, mainly considering the rates of vertical transmission¹⁷. As a result of this health scenario, one should consider the high degree of complexity in confirming the diagnosis of syphilis in children, since most cases have no symptoms, and it is necessary to associate several criteria for the differential diagnosis⁷.

In view of the above, screening, timely diagnosis, treatment to minimize risk, complexity of the disease, and sequelae in the future child are relevant aspects when approaching congenital syphilis^{19,20}. An important factor for successful treatment of pregnant women is the inclusion and monitoring of adherence of sexual partners to treatment to prevent reinfection^{21,22}. Professionals assisting patients should be prepared to include them, since the adherence rate of partners has been low²³.

A great concentration of pregnant women with incomplete elementary education was observed. Other studies also found this concentration in the educational variable^{6,16,19,24}, as well as the association between mother educational level and the incidence of congenital syphilis^{6,16,24}. Thus, it is important considering that low educational level may be related

to the rate of adherence to treatment offered free of charge by the Public Health System, since pregnant woman may not have an understanding of the legacy of this disease for herself and the baby. Another influential factor is the perception of self-care in health, which may not be appropriate.

Historically, Brazil has presented solid national policies for maternal and child care, and the care network (Rede Cegonha) seeks to deepen the pact for health in ensuring comprehensive care for the mother-child binomial. Thus, there is clearly a definition of a care protocol that guides the health system on the forms of access, diagnosis of syphilis, and the flow of pregnant women in the care network for treatment and prenatal monitoring. However, there is a constant need to evaluate this service in order to obtain positive outcomes, and the federative pact with autonomy, and regionalization in the health area contributed a lot to the incorporation of different realities in the provision of care, but there is still a vast scenario to be improved. Considering the epidemic scenario of syphilis in Brazil and the clear concern of national policies to protect the mother-child binomial, this study presented a situational condition to alert authorities and health care professionals about the increasing need for screening and monitoring patients to ensure that the pregnant woman is not reinfected. In this context, an important factor that underlies this situation is the different realities found throughout the national territory, thus, it should be noted that the simple testing of the mother during prenatal care does not guarantee her adherence to treatment, as well as, it occurs with the low adherence of the partner, which can cause maternal reinfection.

CONCLUSION

Incidence rates of syphilis in pregnant women and congenital cases have increased, and sociodemographic factors were associated with them.

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