








PROFILE OF GESTATIONAL SYPHILIS IN THE STATE OF PARANÁ BETWEEN 2010 AND 2018

PERFIL DA SÍFILIS GESTACIONAL NO ESTADO DO PARANÁ ENTRE 2010 E 2018

Mariana Rie Hayashida¹ , Michely Mika Hirota¹ , Nathália Nakase Mizoguti¹ , Fernanda Yuki Ito¹ ,
Maryna Rodrigues Gonçalves¹ , Mayara Rodrigues Gonçalves¹ , Acácia Maria Lourenço Francisco Nasr² 

ABSTRACT

Introduction: Gestational syphilis is responsible for increased fetal morbidity and mortality. It is related to intrauterine and neonatal complications, with vertical transmission being the most severe outcome. Screening and treatments are part of the prenatal routine. **Objective:** To describe the profile of gestational syphilis by state, regional incidence, time of diagnosis and treatment. **Methods:** Quantitative, descriptive, and observational study developed with secondary data from the National System of Notification of Disorders (*Sistema de Informação de Agravos de Notificação – SINAN*), to evaluate the variables: region, trimester of diagnosis and treatment of gestational syphilis. **Results:** Between 2010–2018, Paraná recorded 12,011 cases of gestational syphilis, corresponding to 8.5 per 1,000 live births. There was an increase in the number of cases across the state. Among infected pregnant women, most were between 20–29 years old (50.6%). Of the diagnoses, 43.6% were performed in the first trimester of pregnancy and 26.6% in the second. The most widely used treatment regimen was benzathine penicillin G 7,200,000 IU (63.7%). **Conclusion:** There was an increase in gestational syphilis in Paraná, however, there was greater effectiveness in diagnosis and treatment, with greater detection in the first trimester of pregnancy and prevalence of use of benzathine penicillin G. The study highlights the importance of correct clinical management and early detection, measures that prevent vertical transmission. **Keywords:** syphilis; pregnancy; sexually transmitted diseases; epidemiology.

RESUMO

Introdução: A sífilis gestacional é responsável pelo aumento da morbimortalidade fetal. Está relacionada a complicações intrauterinas e neonatais, sendo a transmissão vertical o desfecho mais grave. Sua triagem e seu tratamento fazem parte da rotina do pré-natal. **Objetivo:** Descrever o perfil da sífilis gestacional no estado, a incidência em regionais, a época do diagnóstico e o tratamento. **Métodos:** Estudo quantitativo, descritivo e observacional desenvolvido com dados secundários do Sistema de Informação de Agravos de Notificação (SINAN), para avaliar as variáveis: região, trimestre do diagnóstico e tratamento da sífilis gestacional. **Resultados:** O Paraná registrou, entre 2010–2018, 12.011 casos de sífilis gestacional, o que corresponde a 8,5 a cada 1.000 nascidos vivos. Houve aumento no número de casos em todo o estado. Entre as gestantes infectadas, a maioria tinha entre 20–29 anos (50,6%). Dos diagnósticos, 43,6% foram realizados no primeiro trimestre de gestação e 26,6%, no segundo trimestre. O esquema terapêutico mais utilizado foi o de penicilina G benzatina 7.200.000 UI (63,7%). **Conclusão:** Houve aumento da sífilis gestacional no Paraná, porém, observou-se maior efetividade no diagnóstico e tratamento, com maior detecção no primeiro trimestre da gestação e prevalência do uso da penicilina G benzatina 7.200.000 UI. O estudo ressalta a importância do correto manejo clínico e da detecção precoce, medidas que evitam a transmissão vertical. **Palavras-chave:** sífilis; gravidez; doenças sexualmente transmissíveis; epidemiologia.

INTRODUCTION

Syphilis is a sexually transmitted disease (STD) of a systemic character, curable and exclusive to humans. It is caused by *Treponema pallidum*, a Gram-negative bacterium in the spirochete group⁽¹⁾. It can present several clinical manifestations and different stages (primary, secondary, latent, and tertiary syphilis). In the primary and secondary stages of infection, the possibility of transmission is greater. The risk of this STD is directly related to the presence of mucocutaneous syphilitic lesions, more common in the first year of infection (primary and secondary phases)^(2,3). Syphilis can be transmitted through unprotected sexual intercourse with an infected person, or to the child during pregnancy or childbirth, that is, through vertical transmission.

Vertical transmission is most often intrauterine, although it can also occur during the passage of the fetus through the birth canal, in case there is an active lesion. The probability of the occurrence

of congenital syphilis is influenced by the stage of syphilis in the mother and the duration of fetal exposure. Thus, transmission is greater (around 70 to 100%) when the pregnant woman has primary or secondary syphilis⁽³⁾.

Congenital syphilis is preventable when the pregnant woman infected with syphilis is adequately treated, however, when not treated, it can have consequences such as abortion, stillbirth, premature birth, neonatal death, and early or late congenital manifestations. There is no vaccine against syphilis and previous infection does not provide protective immunity. Therefore, people can be reinfected each time they are exposed to it, which justifies the more frequent screening during pregnancy⁽³⁾.

The treatment must be carried out as early as possible with the use of penicillin, since, due to the high rates of vertical transmission, if carried out after the 14th week of pregnancy, the treatment of a potentially infected intrauterine fetus should be considered. The recommended penicillin doses are defined based on the diagnosis of recent or late infection. In disease situations in the primary and secondary phases, the recommended dose of benzathine penicillin is 2,400,000 IU divided into 2 injections into each gluteus⁽⁴⁾.

¹Curso de Medicina da Universidade Federal do Paraná – Curitiba (PR), Brazil.

²Comitê Estadual de Prevenção da Mortalidade Materna, Infantil e Fetal, Secretaria de Saúde do Estado do Paraná – Curitiba (PR), Brazil.

Most pregnant women, however, are asymptomatic and have no mention of a previous treatment history or knowledge of the infection. In this situation, the diagnosis is of an undetermined latent phase, and should be treated with 7,200,000 IU, divided into 3 weekly applications of 2,400,000 IU^(4,5).

In 2008, the World Health Organization (WHO) estimated that 1.86 million cases of syphilis occur globally among pregnant women each year and that a large proportion of them are not treated or inadequately treated⁽⁶⁾.

Prevention, diagnosis, and treatment of pregnant women and sexual partners with syphilis should be prioritized, especially in Primary Care. Compulsory notification of pregnant women with syphilis in the country was instituted in 2005, since accurate estimates of local prevalence of syphilis and adverse pregnancy outcomes among women not treated with syphilis are essential in the development of public policies aimed at reducing cases of congenital syphilis^(3,6).

OBJECTIVE

To describe the profile of gestational syphilis in the state of Paraná, as well as its incidence in regions, the time of diagnosis, and treatment.

METHODS

This work is a cross-sectional, quantitative, descriptive, and observational study. The data used were obtained from the Notifiable Diseases Information System (*Sistema de Informação de Agravos de Notificação – SINAN*) to analyze the rates of gestational syphilis detection in the state of Paraná between 2010 and 2018. The variables analyzed were: number of diagnosis, age at the time of diagnosis, period of pregnancy at the time of diagnosis and treatment scheme used. The data obtained were analyzed using basic descriptive

statistics and the calculation of frequencies, automatically generated by the Microsoft Office Excel software.

As these are secondary data, there was no need to submit them to the Research Ethics Committee, with no need for assessment under the ethical standards of Resolution No. 466/2012, of the National Health Council, and international ethical guidelines.

RESULTS

From 2010, there was a gradual increase in the number of diagnoses of gestational syphilis for every 1,000 live births until 2017, with a slight reduction between 2017 and 2018, going from 1.9 in 2010 to 15.2 in 2017, with a slight reduction in 2018 (with 15.8). The highest number of diagnoses occurred in 2017, with 15.2 diagnoses for every 1,000 live births, as shown in **Figure 1**.

With regard to the age of the pregnant woman at the time of diagnosis, there was a predominance in the age group of 20 to 29 years, in all years between 2010 and 2018, ranging from 44.3 (in 2011) to 56.2% (in 2016). The extremes of age, on the other hand, were minority in the diagnosis, with percentages $\leq 5.1\%$ in the age group between 40 to 49 years and $\leq 3.41\%$ in the age group between 10 to 14 years, as shown in **Figure 2**.

Analyzing the gestational trimester in which the diagnosis occurred, there was a tendency to increase diagnoses in the first trimester, with 23.9%, in 2010, and 54.7%, in 2018, and a decrease in diagnoses in the third trimester, with 39.2%, in 2010, and 21.1%, in 2018, shown in **Figure 3**. Compared to 2010, in 2018 there was an increase of 30.8% in the first quarter diagnoses, in the third quarter there was a decrease of 18.1%.

Data related to the treatment of pregnant women diagnosed with syphilis showed there was an increase in the treatment schedule with benzathine penicillin G 7,200,000 IU between 2010 and 2018, with 32.7% in 2010 and 76.2% in 2018, as shown in **Figure 4** and **Table 1**.

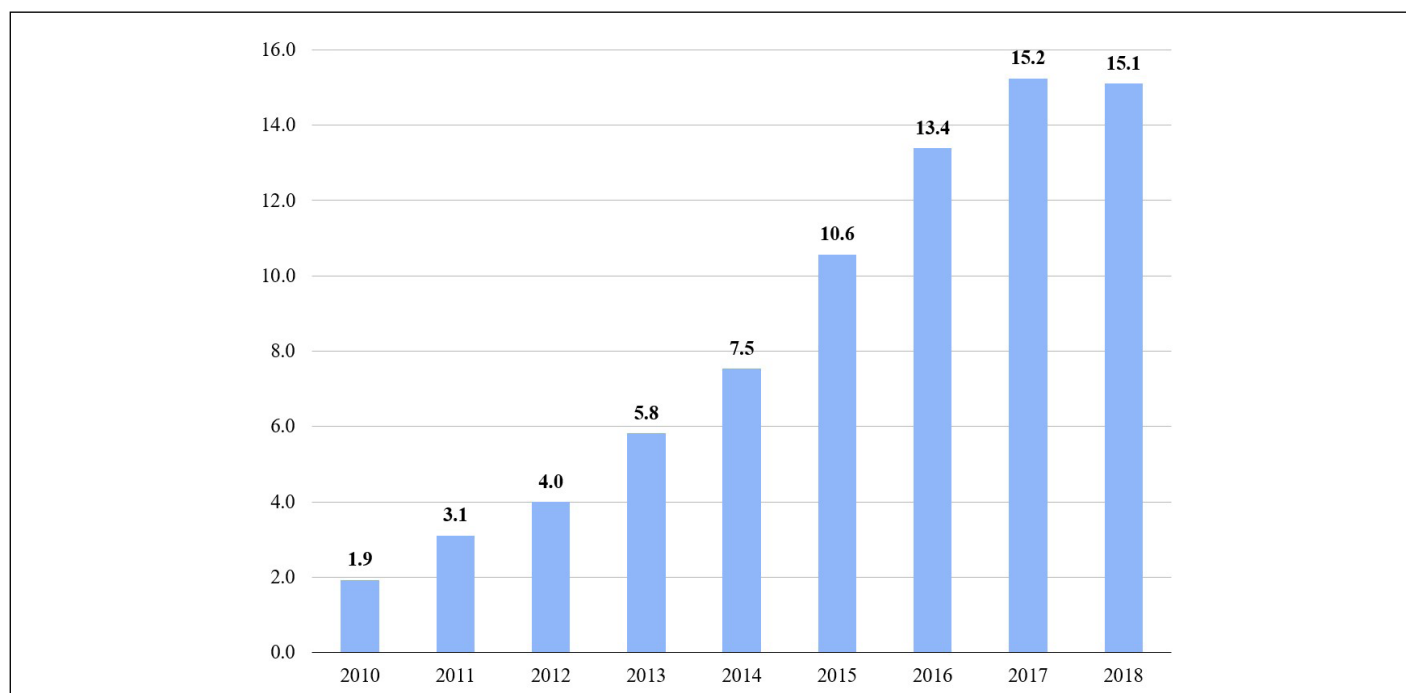


Figure 1 – Number of syphilis diagnoses in pregnant women per 1,000 live births, according to the year of diagnosis, in Paraná, between 2010 and 2018.

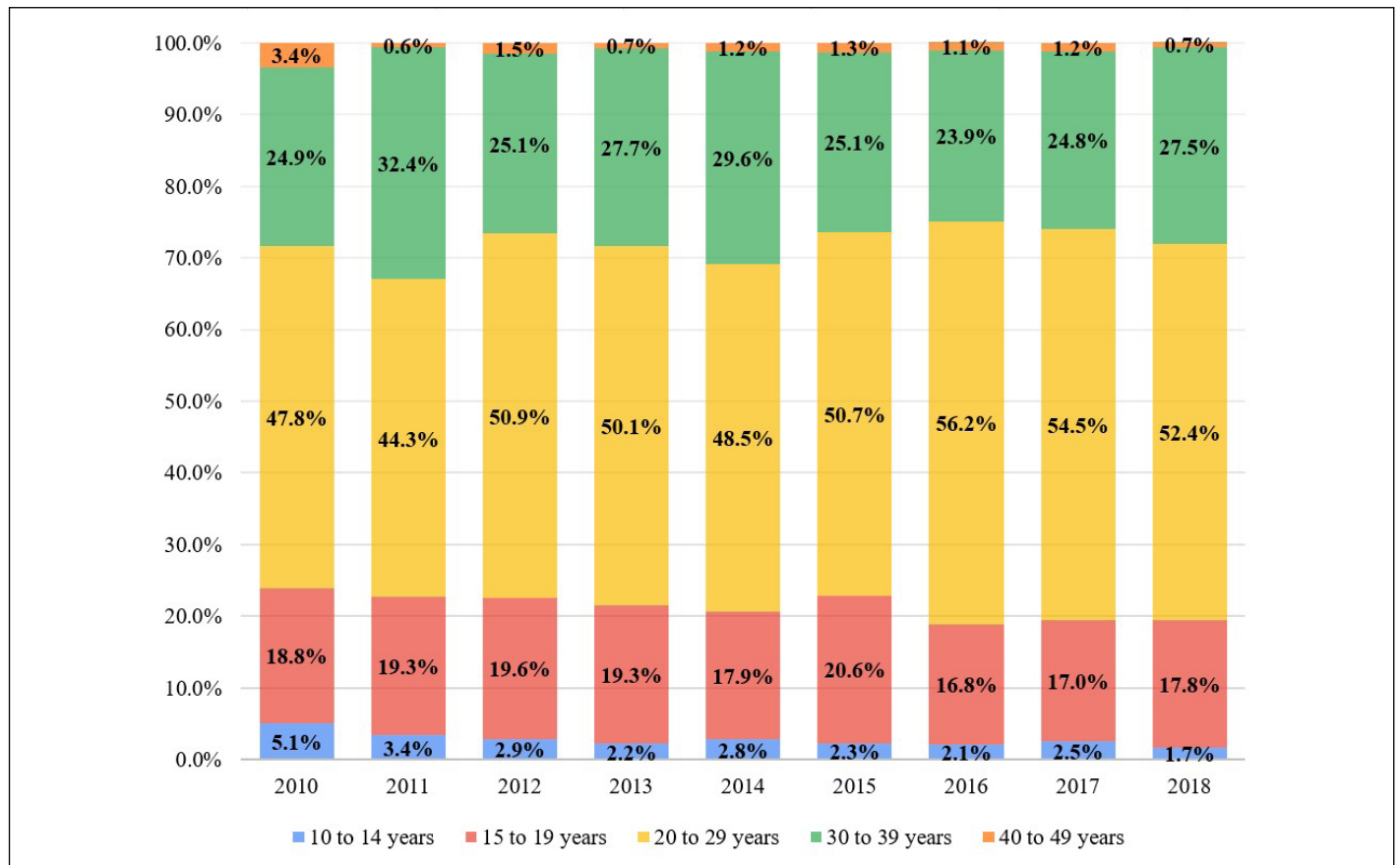


Figure 2 – Percentage of diagnosis of gestational syphilis, according to age group.

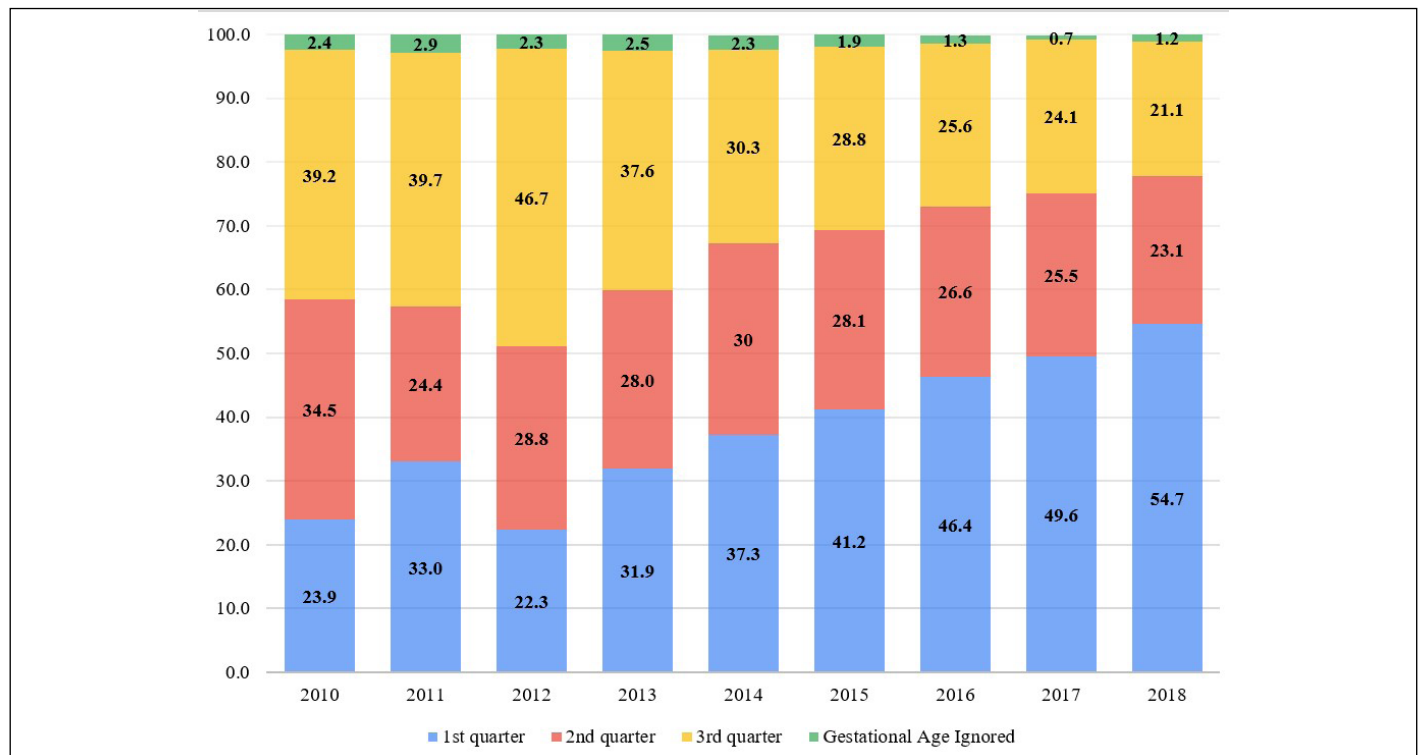


Figure 3 – Percentage of pregnant women with syphilis, by quarter of diagnosis, second year of diagnosis in Paraná, between 2010 and 2018.

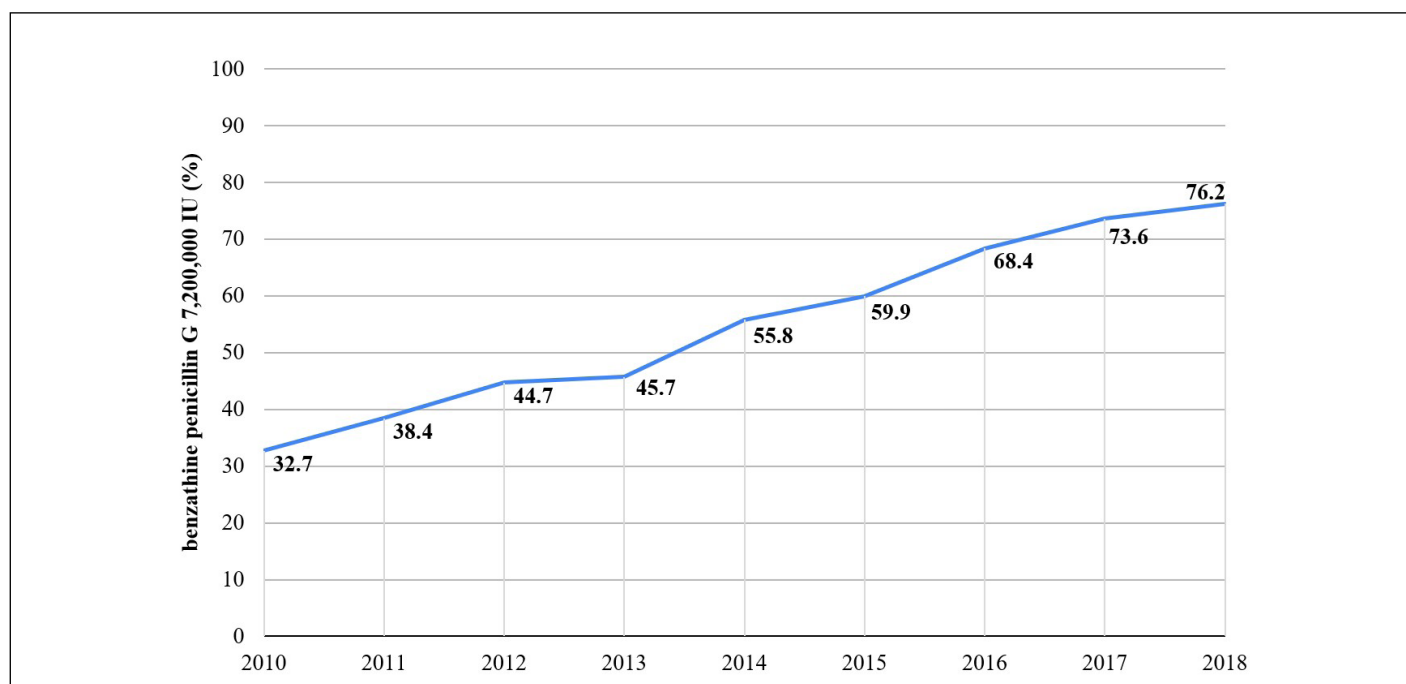


Figure 4 – Percentage of treatments using the benzathine penicillin G scheme with 7,200,000 IU.

Table 1 – Number of treatments performed, according to year and treatment schedule.

Treatment Scheme	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ignored/blank	5	6	4	10	17	13	11	13	12
Benzantine G penicillin 2,400,000 IU	104	143	181	291	299	352	342	351	306
Benzantine penicillin G 4,800,000 IU	39	62	58	90	103	149	118	83	69
Benzantine G penicillin 7,200,000 IU	96	183	274	414	674	1,022	1,421	1,772	1,799
Other schemes	17	22	23	17	27	43	28	22	22
Not performed	32	60	73	83	86	125	156	164	152
Total	293	476	613	905	1,206	1,704	2,076	2,405	2,360

DISCUSSION

Gestational syphilis has been a compulsory notification STD since July 14th, 2005 by Ordinance No. 33 of the Ministry of Health. The importance of notification is justified by the high incidence of syphilis in pregnancy, its high rate of vertical transmission, the irreparable consequences for infected fetus and the fact that syphilis is a preventable and curable disease^(6,7). With only five years of difference between the beginning of the notification requirement to SINAN and the beginning of the period analyzed, the progressive increase in the incidence between the years 2010 and 2018 may indicate both the increase in the number of infected pregnant women and the increase in the number of Notifications. Another confounding factor is the number of pregnant women who received prenatal care during the period. According to data from the last National Survey of Demography and Health of Children and Women, carried out in 2006, the number of pregnant women who did not have any prenatal consultation dropped from 14% in 1996 to 1% in 2006⁽⁸⁾. If the increase in the percentage of pregnant women linked to a prenatal program has continued over the years, consequently there has been an increase in the number of diagnoses and notifications of syphilis cases during pregnancy. In addition to access, the prenatal care offered to all pregnant women must be of

high quality, with defined protocols that include screening for syphilis as early as possible, since in most cases of congenital syphilis, pregnant women receive pre- natal care, but diagnosis and treatment are not early enough to prevent vertical transmission⁽⁹⁾. A cohort study conducted in Brazil interviewed 23,894 women in the postpartum period, between the years 2011 and 2012, and showed that 98.7% of these women had received prenatal care, but only 89.1% had undergone 1 test for syphilis throughout pregnancy and 41.2%, 2 tests⁽¹⁰⁾. Another study carried out in Rio de Janeiro, in 2016, showed that of 84 patients diagnosed with syphilis during pregnancy, 77.4% did not receive adequate treatment until the time of delivery⁽¹¹⁾. These results show that not all women with prenatal care undergo tests for syphilis during pregnancy and, among those who do, not all who test positive are treated correctly.

The age group with the highest incidence was between 20–29 years (50.6%), an expected data for the ages that correspond to the population with the highest specific fertility rate in Brazil and in the most intense phase of sexual life. In a study carried out in São Paulo between 2007 and 2016, there was also a predominance of women in the age group of 20 to 29 years (55%). These results show the need for actions aimed at health education, safer sexual practices and family planning⁽¹²⁾.

In 2008, the WHO published the document entitled “Global Elimination of Congenital Syphilis: Rationale and Strategy for Action”, on which the eradication of congenital syphilis is based on the following strategies: “ensuring political commitment and sustainable promotion; increasing access and quality of maternal and child health services; detecting and treating pregnant women and their partners; establishing surveillance, monitoring and evaluating systems”⁽¹³⁾. The document highlights the importance of notification to assess the regional scenario in relation to syphilis in pregnancy for the worldwide elimination of congenital syphilis, through direct action on gestational syphilis with prevention, early diagnosis and effective treatment.

The diagnosis in pregnant women can be made through the rapid test, a cheap method available in the Unified Health System (*Sistema Único de Saúde* – SUS), which is highly sensitive and specific and does not require infrastructure and specialized labor⁽¹⁴⁾. With a rapid positive test, you can start treatment with intramuscular benzathine penicillin G, also available at SUS. Due to the ease and low cost of detection and treatment, congenital syphilis can be eradicated through the early diagnosis and treatment of pregnant women.

The gestational quarter with the highest rate of detection of syphilis in Paraná during the analyzed period was the first (43.6%), followed by the second (26.6%), an indication of improvement in prenatal care in the region. Another indication was the reduction in the rate of pregnant women with syphilis who did not undergo treatment: drop from 10.92%, in 2010, to 5.42%, in 2019, with a total of 7.69% over the entire period of years analyzed.

The treatment of syphilis during pregnancy is the same for the non-pregnant population, with penicillin G benzathine indicated as the first-line drug in doses of 2,400,000 IU intramuscularly in a single dose, half the dose in each gluteus, for recent syphilis, and 7,200,000 IU divided into 3 weekly doses for late syphilis⁽⁵⁾.

The frequency of treatment with benzathine penicillin G 7,200,000 IU (63.7%) may indicate a higher incidence of late syphilis, that is, syphilis with more than 2 years of evolution or latent infection with an unknown evolution period⁽⁵⁾. This data reflects the importance of public health measures for sex education, detection, and treatment of STD in the general population, since pregnant women may be infected even before conception. In addition to prenatal care, family planning is a factor that therefore directly influences the rates of gestational syphilis. Peixoto argues that pregnancy is a 12-month period, which includes family planning and preconception medical consultation in the 3 months preceding fertilization⁽¹⁵⁾. Based on the importance of pregnancy planning, the Ministry of Health’s Clinical Protocol and Therapeutic Guidelines for Comprehensive Care for People with Sexually Transmitted Infections, published in 2020, includes serological screening for syphilis among the complementary tests to be performed in the preconception consultation⁽¹⁶⁾. Despite the advancement of assistance to pregnant women, with prevalence of syphilis diagnosis in the first trimester of pregnancy and early treatment in the state and period analyzed, the encouragement of family planning consultations would have a major impact on the incidence of gestational and congenital syphilis.

Knowledge about notifications of gestational syphilis is essential in the strategy proposed by the WHO for the elimination of congenital syphilis. Through the analysis of incidence rates, the most affected

age group, the prevalence or not of early diagnosis, and the type of treatment offered, it is possible to understand the scenario of gestational syphilis in each region and promote measures of population education and public health according to local demands.

Strengths

Data from a reliable information system was used over a period of nine years, which provided a large sample space for more accurate analysis of cases of gestational syphilis in the state of Paraná during this period. In addition, different variables were analyzed, enabling a broader view and a better understanding of the disease scenario, essential for planning effective public health measures with the aim of reducing the incidence of gestational syphilis cases in the region.

Limitation

Even in the case of a compulsory notification disease, underreported cases and those reported incorrectly must be taken into account.

CONCLUSION

Data analyzed between 2010 and 2018 in the state of Paraná show an evolution in prenatal care in relation to the prevention of congenital syphilis, with improvement in the rates of early detection of gestational syphilis and treatment of pregnant women. However, there are still improvements to be made in preconception and prenatal care, in order to eliminate the incidence of congenital syphilis in the state.

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Participation of each author

All authors participated equally in the preparation of the study, data analysis, preparation of the manuscript, and approval of its final version.

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Conflict of interests

None.

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Corresponding address:

MARIANA RIE HAYASHIDA

Rua Clávio Molinari, 136 – Capão da Imbuia

Curitiba (PR), Brasil

CEP: 82810-210

E-mail: hayashidamariana@gmail.com

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