

Epidemiological and clinical profile of gestational and congenital syphilis in the state of Bahia in the period 2010-2019

Perfil epidemiológico e clínico da sífilis gestacional e congênita no estado da Bahia no período de 2010-2019

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ABSTRACT | OBJECTIVE: To describe the epidemiological and clinical profile of gestational and congenital syphilis in the state of Bahia from 2010 to 2019. **METHODOLOGY:** Ecological, exploratory study, using secondary data obtained from the Informatics Department of the Unified Health System and the Superintendence of Health Surveillance and Protection, selecting all diagnosed cases of gestational and congenital syphilis in the state of Bahia within the stipulated period. **RESULTS:** The highest frequencies of gestational syphilis and congenital syphilis were observed in 2018 (4,375 and 1,902 cases, respectively). The pregnant women were aged between 19 and 27 years (49.8%) and a significant number of cases were registered during the 3rd trimester of pregnancy (34.8%). As for the epidemiology of congenital syphilis and the mortality rate, the following stood out: female children (47.9%), brown (60.8%), aged between 0 and 27 days (97%) and a rate of 15 /1,000 live births (in 2014). **CONCLUSION:** A high frequency of gestational and congenital syphilis was found in the state of Bahia. The findings may suggest failure in prenatal care and in the treatment of pregnant women and partners, indicating a need for specific attention to the pregnant woman, with strategies to reduce its occurrences, especially of congenital syphilis.

DESCRIPTORS: Syphilis. Gestation. Congenital syphilis. Epidemiology. Mortality.

RESUMO | OBJETIVO: Descrever o perfil epidemiológico e clínico da sífilis gestacional e congênita no estado da Bahia no período de 2010 a 2019. **METODOLOGIA:** Estudo ecológico, exploratório, com a utilização de dados secundários obtidos através do Departamento de Informática do Sistema Único de Saúde e da Superintendência de Vigilância e Proteção da Saúde, selecionando todos os casos diagnosticados de sífilis gestacional e congênita no estado da Bahia no período estipulado. **RESULTADOS:** As maiores frequências de sífilis gestacional e sífilis congênita foram observadas em 2018 (4.375 e 1.902 casos, respectivamente). As gestantes apresentavam faixa etária de 19 a 27 anos (49,8%) e significativo número de casos foram registrados durante o 3º trimestre da gestação (34,8%). Quanto a epidemiologia da sífilis congênita e a taxa de mortalidade, destacaram-se: crianças do sexo feminino (47,9%), pardas (60,8%), com 0 a 27 dias de vida (97%) e taxa de 15/1.000 nascidos vivos (em 2014). **CONCLUSÃO:** Encontrou-se elevada frequência da sífilis gestacional e congênita no estado da Bahia. Os achados podem sugerir falha na assistência pré-natal e no tratamento das gestantes e dos parceiros, indicando uma necessidade de atenção específica à gestante, com estratégias para reduzir suas ocorrências, principalmente, da sífilis congênita.

DESCRITORES: Sífilis. Gestação. Sífilis congênita. Epidemiologia. Mortalidade.

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Introduction

Syphilis is a sexually transmitted infection (STI) that has about six million new cases a year worldwide.¹ In Brazil, between 2010 and 2017, the detection rate of syphilis in pregnant women increased 4.9 times, from 3.5 to 17.2 cases per 1,000 live births, with the Northeast region accounting for 16% of the cases recorded in 2017.²

Some conditions have been associated with the high number of pregnant women affected by this pathology, which are: socioeconomic, behavioral, demographic, and healthcare-related factors. The highest incidence rate of syphilis is concentrated in the Americas, accounting for up to 25% of cases occurring worldwide annually.²

Among the consequences of untreated syphilis in pregnant women, it is estimated that 40% will result in miscarriage, 11% will have full-term fetal death as an outcome, and 13% will imply premature births or low birth weight. About 20% of newborns (NB) will be symptomatic at birth. Pregnant women treated adequately during prenatal care (PN) are diagnosed with a congenital infection in only 1 to 2% of cases, while those not properly treated total 70 to 100% of the occurrences of congenital syphilis (CS).¹

Therefore, it is worth noting that syphilis is characterized as infectious morbidity, with *Treponema pallidum* as an etiological agent. It is a bacterium transmitted to the mother sexually, by hemotransfusion, by contact with mucocutaneous lesions, and transplacentally, in the case of congenital syphilis (CS).³

Treponema infection is polymorphic that alternates symptomatic and asymptomatic periods in which the only finding is positive serology. The detection, consequently, is made by serological screening of pregnant women with non-treponemal⁴ tests, commonly the venereal disease research laboratory (VDRL), and the rapid plasma reagin test. Although almost all Brazilian pregnant women (98%) start prenatal care, it is estimated that at least 10% of them do not perform a single serological test for syphilis.⁵

In congenital forms and pregnant women, the disease is of compulsory notification, being mandatory, professionals in the area notify it, and its non-observance confers violation of healthcare legislation.⁶ When detected, treatment with penicillin G benzathine, both parent and their sexual partner, is the best method to prevent congenital syphilis, which is considered, in epidemiological terms, an indicator of the quality of prenatal care of a population.²

However, national studies have indicated that prenatal care in the country does not have satisfactory quality, considering the number of prenatal consultations and the beginning of follow-up and the criteria for performing routine tests and guidelines on delivery and breastfeeding. When evaluating the structure of health units and the processes in the development of prenatal actions, there were also inadequacies in this care, with problems in access, in the performance of health promotion actions, and the quality of individual and collective care offered to pregnant women.⁷

According to the Epidemiological Bulletin of Syphilis, proposed by the Health Department of the State of Bahia -SESAB⁸, from 2012 to 2018, 17,057 cases of gestational syphilis were reported in the state, while in 2019, preliminary data showed notification of 2,814 cases of syphilis in pregnant women. Furthermore, data from the Notifiable Diseases System (SINAN) showed that in 2013 alone, Brazil had 4,877 confirmed cases of congenital syphilis, with Bahia being the state with the representativeness of 258 cases.⁹

In Bahia, the number of studies that unite the epidemiological and clinical profile of syphilis in pregnant women and the congenital form is relatively scarce. Although local epidemiology is significant, their relationship and the factors that influence them are still limited. Thus, knowledge about the performance, effectiveness, prenatal follow-up, and appropriate treatment for syphilis in the sociodemographic context of women, in addition to factors such as the age of the pregnant woman and the child affected, race/color, level of education, and other elements that contribute directly and indirectly, can contribute to the establishment of strategies for coping.

Thus, this study aimed to describe the epidemiological and clinical profile of gestational and congenital syphilis in the state of Bahia from 2010 to 2019.

Method

This is an exploratory ecological study, which data was obtained through access to tabnet databases (Health Information), made available by the Department of Informatics of the Unified Health System and Suvisa (Superintendence of Surveillance and Health Protection), at electronic addresses (<http://www2.datasus.gov.br/DATASUS/>) and (<http://www.saude.ba.gov.br/suvisa/>), respectively, which were accessed on 09/18/2020, 09/22/2020 and 24/09/2020.

Through Tabnet, access was made following the research order: health information, epidemiological information and morbidity, diseases and diseases of notification – 2007 onwards (SINAN) and selected the options individually, gestational syphilis and congenital syphilis, in addition to the coverage in Bahia.

The studied population corresponds to all cases of gestational syphilis diagnosed and registered in 2010-2019 and all reports of congenital syphilis in 2010-2019 in Bahia. This time interval stipulated for the search is equivalent to the period prior to the beginning of this project, in association with the availability of the data attached to the systems.

The information was systematized according to the epidemiology of congenital syphilis, regarding gender, age group of the child, which covers the first years of life (0- 1 year), race/ color, maternal syphilis, and treatment of the partner. Similarly, the epidemiological variables of gestational syphilis correspond to the age group of the pregnant woman,

race/color, level of education, period of pregnancy, and partner treated. The following exclusion criteria were adopted: acquired syphilis, without association with the gestational period and age, > 1 year for congenital syphilis.

To calculate the rate of detection of syphilis in pregnant women, we used the number of cases of syphilis detected in pregnant women in a given year of notification and place, multiplied by 1,000 and divided by the total number of live births living in the same place and the same year. In addition, the mortality rate due to congenital syphilis was calculated, with the ratio of the number of deaths due to congenital syphilis to every 1,000 live births in the geographic space in a given period. These calculations were obtained from the Information System on Live Births (SINASC) and the Mortality Information System (SIM).

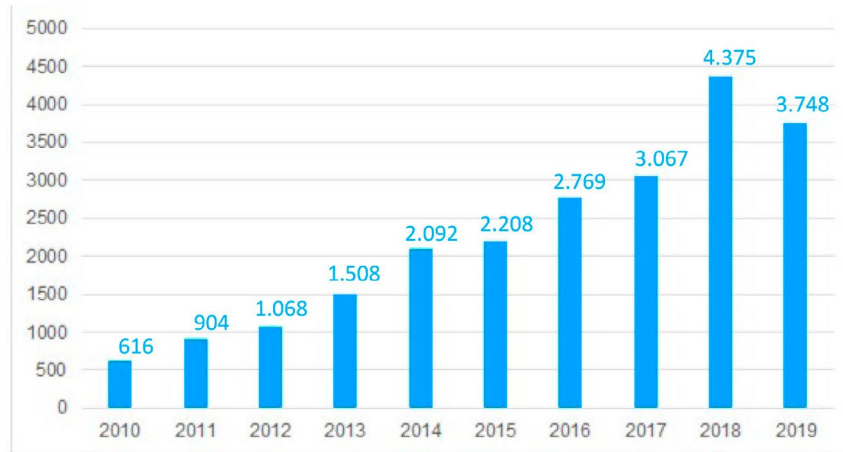
The data demonstrated were configured through the Microsoft Office Excel 2016 platform, and thus, a descriptive statistical analysis was performed to identify the general and specific characteristics of the sample studied. The results were represented through tables and figures, also formulated by Microsoft Office Excel 2016. There were no inferential analyses.

Open secondary data were used, in which a referral to the Research Ethics Committee is waived.

Findings

Among the reported cases, 22,407 records of gestational syphilis were noted in Bahia, in the period 2010-2019. According to Figure 1, there is a proportional increase between the number of cases per place of residence and the years of diagnosis, except in 2018, when a higher frequency of cases is obtained.

Figure 1. Total cases of Gestational Syphilis reported in Bahia, 2010-2019



Source: SESAB/SUVISA/DIVEP/SINAN - Notifiable Diseases Information System.

Table 1 shows a total of 17,439 occurrences of pregnant women with syphilis in Bahia between 2010 and 2019, with values in progression of both cases and years. There was an increase in frequency and detection rate in 2018 and a decrease in cases in 2019, compared to the years between 2013-2018.

Table 1. Cases and detection rate of syphilis in pregnant women in Bahia, 2010-2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cases of Syphilis in Pregnant Women	523	786	957	1,317	1,747	1,977	2,495	2,808	3,866	963
Detection Rate	2,5	3,7	4,6	6,5	8,6	9,6	12,5	13,8	18,9	-

Detection rate: per 1,000 live births

Source: MS/SVS/DCCI - Department of Chronic Diseases and Sexually Transmitted Infections.

Table 2 shows the main epidemiological characteristics of the population with gestational syphilis in Bahia, found in Suvisa and DATASUS, in the period 2010-2019. Regarding the age group, there is a higher prevalence of gestational syphilis between 19 and 27 years of age, with 11,161 (49.9%) reported cases. According to race/color, there was a higher prevalence among browns, with 13,509 registered cases (60.3%) and a lower prevalence among the indigenous race, equivalent to 91 cases (0.4%) in Bahia, in the period analyzed. When analyzing the mother's schooling, a higher value of reported cases of gestational syphilis is observed, corresponding to the 5th to 8th incomplete grade of elementary school, with 4,601 cases (20.5%). Regarding gestational age, there was a higher detection of cases during the third trimester, with 6,411 notifications (34.8%), and regarding the partner treated, a greater number of untreated partners were observed, with 9,739 cases (43.5%).

Table 2. Epidemiological characteristics of the population with gestational syphilis in Bahia between 2010-2019

Variables	N (22,407)	%
Age group		
10 to 18 years	4.158	18,5
19 to 27 years	11.161	49,8
28 to 35 years	5.272	23,5
36 to 49 years old	1.811	8,0
Race/color		
White	1.473	6,6
Black	4.614	20,6
Yellow	211	0,9
Brown	13.509	60,3
Indigenous	91	0,4
Ign/White	2.509	11,2
Schooling		
Illiterate	225	1,0
1st to 4th incomplete elementary school series	1.582	7,1
4th complete series of elementary school	941	4,2
5th to 8th incomplete elementary school	4.601	20,5
Complete elementary school	1.445	6,4
Incomplete high school	2.356	10,5
Complete high school	2.842	12,7
Incomplete higher education	187	0,8
Complete higher education	110	0,5
Ign/White	8.115	36,2
Gestational age		
1st Quarter	3.876	21,0
2nd Quarter	6.038	32,8
3rd Quarter	6.411	34,8
Gestational Age Ignored	2.111	11,4
Treated partner		
Yes	5.931	26,5
No	9.739	43,5
Ign/White	6.737	30,0

Source: SESAB/SUVISA/DIVEP/SIVAN - Notifiable Diseases Information System MS/SVS/DCCI - Department of Chronic Diseases and Sexually Transmitted Infections

Between 2010 and 2019, in Bahia, 12,183 cases of congenital syphilis were also reported, with a higher peak in 2018, equivalent to 1902 registered cases and a mortality rate of 8.93/1,000 live births in this period, with a higher rate in 2014 (15/1,000 live births) (Table 3).

Table 3. Total cases of Congenital Syphilis and mortality rate due to Congenital Syphilis in Bahia 2010-2019

Year	Number of cases	Mortality rate (1000 live births)
2010	403	2,48
2011	559	12,5
2012	679	11,7
2013	934	6,42
2014	1.199	15,0
2015	1.484	9,43
2016	1.808	7,19
2017	1.779	7,86
2018	1.902	8,93
2019	1.433	3,48

Source: SESAB/SUVISA/DIVEP/SIVAN - Notifiable Diseases Information System

Table 4 presents data on the epidemiological characteristics of the population in relation to congenital syphilis obtained in Suvisa and DATASUS, in the period 2010-2018, in Bahia. Between the years 2010-2018, the reported cases of congenital syphilis showed a predominance of females, with 4,179 cases (47.9%), while males had 3,763 notifications (43.1%). In relation to the age group, there was a higher occurrence in the period from 0 to 27 days of life, with 8,459 cases (97%). As for race/color, the predominance occurred in the brown race with 5,300 cases (60.8%). In addition, it was noted that maternal syphilis presented higher detection of the disease during prenatal care, with 3,967 records (45.5%), followed by detection at the time of delivery, with 2,737 reported cases (31.4%). Finally, there was a predominance of the absence of treatment of the partner, registering 4,880 cases (56%).

Table 4. Epidemiological characteristics of the population in relation to congenital syphilis in Bahia between 2010-2018

Variable	N (8,714)	%
Sex		
Male	3,763	43,1
Female	4,179	47,9
Ign/White	772	8,85
Age group		
0 to 27 days	8,459	97,0
28 to 364 days	235	2,69
Race/color		
White	385	4,41
Black	595	6,82
Brown	5.300	60,8
Yellow	33	0,37
Indigenous	12	0,13
Ign/White	2.389	27,4
Diagnosis of maternal syphilis		
During prenatal care	3,967	45,5
At the time of delivery	2,737	31,4
Postpartum	1,253	14,37
Unrealized	54	0,61
Ign/White	703	8,06
Partner treatment		
Yes	1.303	14,95
No	4,880	56,0
Ign/White	2.533	29,0

Source: Ministry of Health/SVS - Notifiable Diseases Information System - Sinan Net.

Discussion

The study presents data that correlate gestational syphilis and congenital syphilis in the state of Bahia, revealing how much of an important public health problem it is, along with the need for prenatal care with due treatment of infected partners, and the importance of training health professionals in the correct approach to infection ever since pregnancy, in order to prevent complications, such as the progression to congenital syphilis and possible death.

The results of the research showed a progressive increase in syphilis notifications in pregnant women treated in the state of Bahia during the stipulated period; the findings were not directly related to the age of the women, but there was a high presence in the age group from 19 to 27 years, in brown women who did not complete elementary school. A similar pattern was found in other states, such as Maranhão, where there is a higher prevalence of infection in young pregnant women (20 to 24 years old), brown women, with low schooling and housewives¹⁰, also emphasizing that pregnant women with declared schooling had between 4 and 7 years of schooling, equivalent to incomplete 1st to 4th-grade courses.¹¹ On the other hand, a study pointed out that pregnant women under the age of 20 years were at higher risk of acquiring the infection during pregnancy, which can be explained by the vulnerability of the adolescent population, more exposed to sexually transmitted diseases, since it is a phase of age, emotional and cognitive immaturity, in addition to a period of discoveries and great influence of social groups.¹²

Thus, these epidemiological data suggest how much the social, economic, and educational context can influence access to health, knowledge, and prevention against the disease. However, it cannot be affirmed that syphilis is a risk condition exclusively of poorer populations, on the contrary, regardless of social or economic condition, everyone can acquire the infection, but the risk is higher in more vulnerable¹² populations.

Regarding the variable, gestational age, a higher number of syphilis records was shown in the third trimester. Similar to the findings of this research, the study by Conceição, Câmara, and Pereira¹⁰ also identified a high frequency of syphilis diagnoses in the third trimester of pregnancy. This diagnosis, however, is considered late and may be related to the late onset of prenatal care in pregnant women. Research conducted in China observed that women with less schooling had their first prenatal visit at 28 weeks of gestation or later, although the incidence of congenital syphilis among women who received treatment before 28 weeks was significantly lower than those who had treatment only after 28 weeks or no treatment.¹³

It should be noted that this research found a higher prevalence of untreated partners. This finding is important to the extent to which situation can contribute to cases of reinfection of pregnant women, reinforcing the importance of performing the diagnosis and treatment of the sexual partner during the woman's prenatal care. According to the results presented, a randomized clinical trial concluded that only 18.3% of the partners of pregnant women with positive tests for syphilis received treatment, and the partners of men who did not attend the test had worse delivery results. However, it was also observed an underestimation of the number of men treated, since 15% of them attended for treatment without notifying their partner; therefore, there may be several reasons for the low frequency of these, including mothers who did not inform men, informed partner, but who did not attend and partner who attends, but does not tell the woman.¹⁴

It is emphasized, therefore, that the treatment of the partner is essential to avoid the reinfection of the pregnant woman, being the non-performance of this treatment, or the performance of inadequate treatment, one of the criteria adopted by the Ministry of Health for the definition of a case of congenital syphilis.¹⁵

In the present study, we also pointed out an increasing number of cases of congenital syphilis in Bahia, between 2010-2018, with higher notifications in female children, aged 0 to 27 days of life, brown and with mothers who were diagnosed in prenatal care. This last data generates a doubt regarding the correct performance of prenatal care and the conduction for the treatment of pregnant women. In this perspective, Conceição, Câmara, and Pereira¹⁰ refer to a predominance of congenital syphilis in children born to mothers who underwent prenatal follow-up, but that the diagnosis of maternal infection occurred, mainly, during childbirth or curettage, which proved late and configured a failure in prenatal care for the correct management of the infection.

In addition, children with congenital syphilis in Bahia, in the period 2010-2013, had up to 6 days of life (94.7%), 52 (3.3%) had 7-27 days, and 33 (2.1%) had between 28 days and <1 year⁹ and, according to the reports of congenital syphilis, 45.63% of the partners of pregnant women diagnosed with gestational syphilis did not undergo treatment and in 8.74% of the notifications were not informed of the treatment, indicating an increase in the number of untreated individuals.³

However, these data are far from what the Pan American Health Organization (PAHO) advocates as a goal for eliminating congenital syphilis in the Americas, defined as the occurrence of fewer than 0.5 cases per 1,000 live births. In order to achieve these objectives, that is determined to ensure sustained political commitment and promotion, increase access and quality to health services for mothers and newborns, detect and treat pregnant women and their partners, and establish surveillance, monitoring, and evaluation¹⁶ systems.

As for congenital syphilis and mortality rate complications, research analyses in the United States showed a high continuous risk of complications of congenital syphilis, and in 2016, deaths caused by it (including stillbirths) exceeded syphilis deaths among adults. However, cases in adults exceeded congenital cases by a factor of 100.¹⁷ Similarly, data obtained from Brazilian studies showed that the average rates of infant mortality, miscarriage, stillbirths per year and region increased during the evaluation period (2010-2015). Furthermore, significant differences were detected in infant death due to congenital syphilis compared to the average mortality rate for

children < 1 year old¹⁸, and babies born to mothers not treated with syphilis had 10% more deaths than those born by mothers without syphilis.

The abovementioned data suggest that a considerable burden of mortality is currently neglected due to short follow-up periods.¹⁹ However, information on mortality from congenital syphilis is still restricted in the literature, and according to Saraceni et al.²⁰, in Brazil, only a few states of the Federation provide information on perinatal mortality, and therefore, little is known about the magnitude of late fetal mortality.

The limitations found in our study are related to the use of secondary data, which makes it susceptible to filling failures or incomplete data in the notification forms, with a probability of underreporting and underreporting and, consequently, poor quality the recorded information. Thus, using a database system to analyze the magnitude of mortality from congenital syphilis is not sufficient due to the lack of uniformity in the records of deaths between SIM and SINAN. It is also worth noting that few studies are focusing on congenital syphilis in the state of Bahia.

Conclusion

In short, there was a significant growth of gestational syphilis and congenital syphilis until 2018, characterizing the infection in young pregnant women with low schooling, who perform prenatal care late, and that the partners are not treated, revealing the fragility of prenatal care provided to pregnant women, which is essential to prevent vertical transmission. Regarding the prevalence of congenital syphilis, there was a predominance in children in the neonatal, female, and brown periods, which most mothers had had prenatal care.

Based on these data, it is essential to adopt measures in order to qualify the surveillance of gestational and congenital syphilis and improve care, aiming to improve the knowledge and practices of early self-care of these pregnant women, screening and correct treatment, not only of her as a partner, if it is infected, thus promoting effective follow-up from prenatal care to the time of delivery; thus, vertical transmission is avoided, and reduced mortality rates from congenital syphilis are promoted.

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Authors' contributions

Cerqueira LB participated in the conception, design, search, and statistical analysis of the research data, interpretation of the results, writing, reviewing, and forwarding the scientific article. Andrade ACM participated in the conception, design, structuring of the introduction and methodology, and formatting of the scientific article. Oliveira MCS participated in the conception, design, search, and statistical analysis of the research data and interpretation of the results of the scientific article. Jesus TA participated in the conception, design, structuring of the introduction and methodology, and writing and reviewing the scientific article. Brasil CA participated in the orientation of all stages of construction of the scientific article.

Conflict of interest

No financial, legal or political conflict involving third parties (government, companies and private foundations, etc.) has been declared for any aspect of the work submitted (including, but not limited to grants and financing, participation in advisory board, study design, manuscript preparation, statistical analysis, etc.).

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