

THE EPIDEMIOLOGICAL PANORAMA OF CONGENITAL SYPHILIS IN A NORTHEAST CAPITAL: STRATEGIES FOR ELIMINATION

O panorama epidemiológico da sífilis congênita em uma capital do nordeste: estratégias para a eliminação

El panorama epidemiológico de la sífilis congénita en un capital del nordeste: estrategias para la eliminación

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ABSTRACT

Objective: The study's purpose has been to describe the panorama of congenital syphilis in a Northeast Capital over the period from 2010 to 2015. **Methods:** this is a descriptive epidemiological study, which was undertaken using the retrospective survey type with a quantitative approach. **Results:** most mothers that performed prenatal care were diagnosed only at the time of childbirth or curettage, and did not undergo any treatment. Most children were diagnosed with recent congenital syphilis. The municipality maintained an average of 2 cases of congenital syphilis deaths/year and an incidence rate above the national average. **Conclusion:** the results presented by the present study confirm that congenital syphilis is still far from being eradicated in the municipality, since incidence rates are remaining above the national average.

Descriptors: Nursing, Congenital syphilis, Epidemiology, Care line, Health surveillance.

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RESUMO

Objetivo: Descrever o panorama da sífilis congênita em uma capital do Nordeste no período de 2010 a 2015. **Métodos:** trata-se de um estudo epidemiológico descritivo, do tipo levantamento retrospectivo, com abordagem quantitativa. **Resultados:** a maioria das mães realizaram o pré-natal, foram diagnosticadas apenas no momento do parto ou curetagem e não realizaram nenhum tratamento. A maioria das crianças foram diagnosticadas com sífilis congênita recente. E o município manteve-se com uma média de 2 casos de óbitos por sífilis congênita /ano e uma taxa de incidência acima da média nacional. **Conclusão:** os resultados apresentados pelo presente estudo comprovam que a sífilis congênita ainda se encontra longe de ser erradicada no município, pois as taxas de incidência estão se mantendo acima da média nacional.

Descritores: Enfermagem, Sífilis congênita, Epidemiologia, Linha de cuidado, Vigilância em saúde.

RESUMEN

Objetivo: Describir el panorama de la sífilis congénita en una capital del Nordeste en el período de 2010 a 2015. **Métodos:** se trata de un estudio epidemiológico descriptivo, del tipo levantamiento retrospectivo, con abordaje cuantitativo. **Resultados:** la mayoría de las madres realizaron el prenatal, fueron diagnosticadas apenas en el momento del parto o curetaje y no realizaron ningún tratamiento. La mayoría de los niños fueron diagnosticados con sífilis congénita reciente. Y el municipio se mantuvo con una media de 2 casos de muertes por sífilis congénita / año y una tasa de incidencia por encima de la media nacional. **Conclusión:** los resultados presentados por el presente estudio comprueban que la sífilis congénita aún se encuentra lejos de ser erradicada en el municipio, pues las tasas de incidencia se mantienen por encima de la media nacional.

Descriptorios: Enfermería, Sífilis congénita, Epidemiología, Línea de cuidado, Vigilancia en salud.

INTRODUCTION

Sexually Transmitted Infections (STIs) are caused by pathogens that are transmitted, mainly, through unprotected sexual contact with an infected person. It can also be transmitted vertically, in other words, from the mother to the child via the transplacental route during pregnancy. STIs are a major public health problem and in the sexually active Brazilian population, syphilis is among the STIs with the highest incidence per year.^{1,2}

Syphilis is a systemic infectious disease of chronic evolution, preventable, curable, exclusive to humans, caused by the bacterium *Treponema pallidum*. The main routes of transmission are through unprotected sex (acquired syphilis) and vertically, in pregnant women (syphilis during pregnancy), with serious consequences for the fetus, which can lead to death through congenital syphilis.^{3,4}

The Brazilian Ministry of Health (MH) determines that every child exposed to syphilis during pregnancy, whether or not treated in the neonatal period, must be followed up on an outpatient basis. However, especially in Brazil, there are not enough studies on this follow-up, which is not consistent with the importance of the subject.^{6,7}

Over time, several strategies to contain the disease have

been implemented with the aim of reducing and controlling incidence rates in countries, States, and municipalities and even achieving the eradication of the infection. In 2015, some goals were established by the Pan American Health Organization (PAHO), World Health Organization (WHO) and MH, such as minimum incidence rate of 0.5 cases for every 1,000 live births and providing early diagnosis and adequate treatment for at least 95% of pregnant women and partners. Congenital syphilis has been subject to national compulsory notification since 1986, syphilis in pregnant women, since 2005, and acquired syphilis since 2010.⁸

Despite the fact that the clinical protocol is well established and the treatment is low cost and offered to the population by the *Sistema Único de Saúde (SUS)* [Brazilian Unified Health System], the persistence of the high incidence of congenital syphilis is still characterized as a sign that the quality of care maternal-fetal health is not yet adequate.⁹

Even with compulsory notification and all attempts to eradicate the infection, the numbers of new cases have not shown a considerable decrease. According to the 2017 Epidemiological Bulletin for Syphilis, the Northeastern Region has shown congenital syphilis incidence rates higher than the national rate. The *Alagoas* State has been showing a drop in rates of detection of congenital syphilis since 2015. Nevertheless, the State is among the Federative Units with the highest coefficients of mortality from congenital syphilis in children under one-year-old per 100 thousand live births. In this perspective, the city of *Maceió* is on the list of priority municipalities, as it had higher incidence rates of congenital syphilis than the detection rates of syphilis in pregnant women, and being higher than the national average.^{8,9}

Given this scenario, the present study had as a guiding question what is the epidemiological characteristics of newborns exposed to congenital syphilis?

Aiming to answer the guiding question, this study targets to describe the panorama of congenital syphilis in a Northeast Capital over the period from 2010 to 2015.

METHODS

This is a descriptive epidemiological study, which was undertaken using the retrospective survey type with a quantitative approach.

The primary variables were the occurrence of syphilis during pregnancy, congenital syphilis in children under one-year-old since the MH defined this age group to guide the actions of epidemiological surveillance and specific infant death due to congenital syphilis. Secondary variables were the factors associated with these infections and the cases of the live newborns of mothers living in *Maceió* city during the period determined in the research. The factors associated with congenital syphilis and syphilis during pregnancy for this research follow the model of the

Investigation and Notification Form for these infections.

Surveys were carried out of the socio-cultural and clinical data of the pregnant woman diagnosed with syphilis and of the epidemiological characteristics related to children under one-year-old diagnosed with syphilis.

The data were obtained from the public domain databases of the Department of Sexually Transmitted Disease (STD), Acquired Immunodeficiency Syndrome (AIDS) and Viral Hepatitis, *Secretaria de Vigilância em Saúde (SVS)* [Secretariat of Health Surveillance], the *Sistema de Informações sobre Nascidos Vivos (SINASC)* [Live Birth Information System], the *Sistema de Notificações e Agravos Notificados (SINAN)* [Notifiable Diseases Information System] and the 2017 Epidemiological Bulletin prepared by the Health Surveillance Secretariat of the MH. All of these systems are fed by the municipal and state health departments.

The eligibility criteria were as follows: have been notified compulsorily between January 2010 and December 2015; cases of syphilis during pregnancy; cases of children under one-year-old who were notified due to a final diagnosis of congenital syphilis; cases of specific infant death from congenital syphilis; cases notified in Maceió; live births of mothers living in Maceió city. On the other hand, the exclusion criteria were cases that have been notified after December 2015, as the data after this date are not yet complete; pregnant women who did not perform prenatal care in Maceió city.

The syphilis incidence coefficients during pregnancy were obtained from the number of cases of pregnant women diagnosed with syphilis detected in city of Maceió in the given period, divided by the total number of live births residing in the same location (with demographic information available through demographic censuses) and year of notification, times 1,000; the incidence coefficient of congenital syphilis was obtained through the number of cases of children under one year diagnosed with syphilis detected in Maceió city in the given period, divided by the total number of live births of mothers living in the same place and year of notification, times 1,000.⁸

The mortality coefficients for congenital syphilis were obtained from the number of deaths from congenital syphilis in a given period and place of residence, divided by the number of live births of mothers living in the same place in the same period, times 100,000.⁸

The data obtained were organized from the variables described in the methodology of this research, added to spreadsheets for making tables and figures, and were analyzed using descriptive statistics based on absolute and relative frequency using Excel® 2013 and Word® 2013 as a simplified percentage.

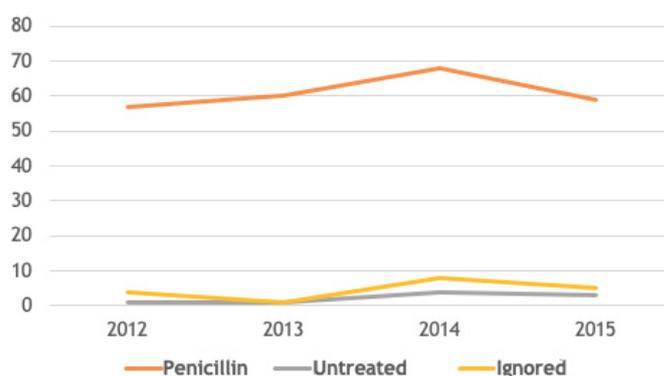
This study did not need to be assessed by the Research Ethics Committee, according to the Resolution No. 466/2012 from the National Health Council, as the results refer to the publicly accessible databases of the *Secretaria*

Estadual de Saúde do Estado de Alagoas (SESAU) [State Health Department of the Alagoas State].

RESULTS

Most cases of syphilis in pregnancy were detected in the second trimester and were reported regarding the clinical classification of primary syphilis.

Figure 1 - Distribution of syphilis cases in pregnant women according to the treatment scheme per year of diagnosis, reported between 2012-2015. Maceió city, Alagoas State, Brazil, 2018



Source: MH/SVS/Department of STD, AIDS, and Viral Hepatitis. 2018.

As shown in **Figure 1**, it was possible to observe an increase in the number of cases of pregnant women who started to be treated with Penicillin between the years 2012 and 2014. Between the years 2014 and 2015, there is a considerable decline in these cases and an increase in cases of pregnant women who did not undergo any type of treatment. No data were available on the treatment scheme for pregnant women in the years before 2012.

Concerning the maternal sociodemographic characteristics of the notified cases of congenital syphilis, it was noted that most mothers were between 20 and 29 years old, self-declared to be brown, and did not finish elementary school. Concerning the maternal diagnosis of syphilis in the notified cases of congenital syphilis, it was observed that the majority performed prenatal care and were diagnosed only at the time of delivery or curettage. In addition, a large minority was treated appropriately, and more than half did not undergo any treatment and their sexual partners were not treated.

Table 1 – The congenital syphilis number of cases and incidence rate, per 1,000 live births, over the period from 2010 to 2015, in the *Alagoas* State and capital. *Maceió* city, *Alagoas* State, Brazil, 2018.

Year	Live births	<i>Alagoas</i> Notified cases N=2,115	Incidence	Live births	<i>Maceió</i> Notified cases N=1,146	Incidence
2010	54,164	217	4.0	15,201	115	7.5
2011	54,281	324	5.9	15,466	173	11.2
2012	52,510	368	7.0	14,873	222	14.9
2013	52,488	409	7.7	15,172	225	14.8
2014	51,859	413	7.9	14,886	220	14.7
2015	52,257	384	7.3	15,558	191	12.2

Source: SINASC, SINAN, MH/SVS/ Department of STD, AIDS, and Viral Hepatitis. 2018.

In *Alagoas* State, 2,115 cases of congenital syphilis were reported in children under one-year-old over the period from 2010 to 2015, of which 1,146 were reported in *Maceió* city, which corresponds to more than half of the cases. The number of live births to mothers who lived in *Maceió* city over the period from 2010 to 2015 was 91,156. Hence, the incidence rate of *Maceió* city was much higher compared to the *Alagoas* State.

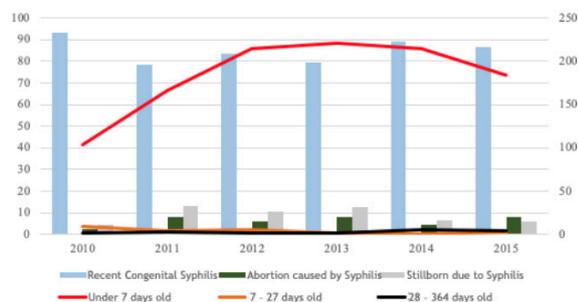
Table 2 - Cases of congenital syphilis according to the child's age by year of diagnosis over the period from 2010 to 2015. *Maceió* city, *Alagoas* State, Brazil, 2018.

Age							TOTAL	
	2010	2011	2012	2013	2014	2015	Nº	%
Under 7 days old	104	166	214	221	214	184	1103	96.24
7-27 days old	9	4	6	2	1	3	25	2.18
28-364 days old	2	3	2	2	5	4	18	1.57

Source: SINAN, MH/SVS/ Department of STD, AIDS, and Viral Hepatitis. 2018

The diagnosis of congenital syphilis in children under one-year-old performed in the first 7 days of life corresponds to the vast majority of notifications and there was a reduction in the number of cases diagnosed in this age group between the years 2013 to 2015. The largest number of cases and percentage of final diagnoses is summarized in recent congenital syphilis, which refers to cases reported in children under 2 years old.

Figure 2 - Correlation between cases of congenital syphilis according to final diagnosis and cases of congenital syphilis according to the child's age by year of diagnosis, over the period from 2010 to 2015. *Maceió* city, *Alagoas* State, Brazil, 2018.



Source: MH/SVS/Department of STD, AIDS, and Viral Hepatitis. 2018.

Deaths due to congenital syphilis in the city of *Maceió* maintained an average of 2 cases per year during the period studied. No case of specific death from congenital

neurosyphilis has been reported in the *Alagoas* State from 2010 to the present day.⁸

DISCUSSION

The increase in the number of cases of syphilis during pregnancy and congenital syphilis in the *Maceió* city has drawn attention to the need to develop strategies and actions of great impact and educational nature, which impact on incidence rates and focus on disease control.

Studies show that this increase may represent an improvement in the notification of cases over the years, attributed to advances in the epidemiological surveillance of municipalities and the State, to the training of human resources, to the expansion of pregnant women access to prenatal consultation as a result of the implantation from the Family Health Strategy teams, the implementation of the *Programa de Humanização no Pré-natal e Nascimento (PHPN)* [Humanization Program for Prenatal and Birth], as well as the *Projeto NASCER* [Being Born Project] in the reference maternity hospitals.¹⁰

The results of this study show that the incidence of congenital syphilis in *Maceió* city presented higher results in relation to the incidence in *Alagoas* State and also concerning the incidence of syphilis in pregnancy, which may be related to possible failures in the diagnosis of syphilis in pregnancy, erroneous notification as acquired syphilis and also to failures in the epidemiological surveillance system in *Maceió* city.¹¹

The results proved to be far beyond what was stipulated by PAHO, of less than one case of congenital syphilis for every 1,000 live births in the year 2000, with the average for the *Maceió* city being 12.55 cases for every 1,000 live births.

The proportions may change due to the implementation of Informative Note No. 2-SEI/2017-DIAHV/SVS/MH, which will disregard the information on the concomitant treatment of the sexual partnership of pregnant women as a classification criterion for adequate treatment.⁸

Most cases of syphilis during pregnancy were detected in the second trimester and 38.72% of pregnant women diagnosed with syphilis were diagnosed only in the third trimester, which refers to the poor quality of prenatal care concerning the immediate capture of pregnancy, failure to request first trimester exams or first appointment. It is important to note that one of the factors that classify the treatment of pregnant women with syphilis as appropriate is, having completed the treatment regimen up to 30 days before childbirth. Besides, the *SUS* offers all the necessary tests for diagnosis, and it is up to the health professional involved in the process to perform or request them at the appropriate time.^{8,11}

Considering the 408 pregnant women diagnosed with syphilis, 113 were classified with primary syphilis and 52 with secondary syphilis, in other words, 40.45% of these women were more likely to transmit the treponema to

the fetus, since there are direct relationships between the stage of infection in pregnant women and the transmission of bacteria. The more recent the infection, the greater the likelihood of infection to the fetus. Nevertheless, it is important to highlight another aspect of this variable, as of the total number of pregnant women, 121 (29.66%) had the infection classification ignored, which calls attention to the poor completion of the Notification/Investigation Form, or even to the difficulty in determining the stage of the disease, either due to lack of input or lack of updating by health professionals.¹²

The treatment scheme that most predominated among notifications of syphilis during pregnancy was treatment with Penicillin, which is the drug of choice for that, according to the MH. Nonetheless, between the years 2014 and 2015 there was a reduction in the number of pregnant women treated with Penicillin and an increase in the number of pregnant women treated with another drug regimen and whose treatment regimen was ignored. This is due to the fact that in 2014 there was a shortage of Penicillin in health facilities. The MH, in line with this situation, issued a Joint Informative Note No. 109/2015, making public the national shortage of penicillin antibiotics, especially benzathine penicillin, due to the lack of specific raw material for their production in the global market.^{4,13}

Regarding the educational level of mothers of children diagnosed with congenital syphilis, women who had incomplete elementary education predominated, which leads to the conclusion that this population with low education has little understanding about the disease, the importance of monitoring during pregnancy and also about STI prevention. Women with low schooling and black or brown had a higher prevalence of syphilis during pregnancy.¹⁴

Another item observed was the occurrence of cases of congenital syphilis in children and mothers with 12 or more years of schooling (complete higher education), as it is believed that this population has minimal knowledge about STIs, ways of prevention and the importance of carrying out the prenatal. In addition, the number of cases classified as ignored with regard to education is also worrying, as it corresponded to 16.8% of cases.¹⁰

The average age of mothers who had their children diagnosed with syphilis was 15-29 years old, a fact also found in other studies conducted in other Brazilian capitals, such as in *Brasília*, *Ceará*, and *Natal*. This result is justified by the Brazilian female reality, where this age group represents the peak of the reproductive phase, which suggests a greater number of pregnancies in the age group in question.¹⁵

Almost 90% of congenital syphilis cases had the mother's race/color variable classified as brown, but this result coincides with other studies carried out in other places, such as *Recife*, *Natal*, and *Espírito Santo*. Besides, data from the Department of STD, AIDS, and Viral Hepatitis

and *Secretaria de Vigilância em Saúde (SVS)* [Secretariat of Health Surveillance] also reaffirm this predominance of ethnicity.^{16,17}

Because of the cases of congenital syphilis reported throughout the city, only 67.36% of mothers received prenatal care. Furthermore, it was not possible to detect how many prenatal consultations were performed, as there was no data available on this variable during the period studied. Therefore, there is a major failure in the capture of pregnant women and, consequently, the performance of prenatal care, since the MH recommends that the coverage of prenatal care must be adequate in quantity and quality and cover 100% of pregnant women.¹⁰

Concerning the time of diagnosis of maternal syphilis, it was observed that in more than half of the cases the diagnosis is only made at the time of childbirth, only 25.04% discover the infection during prenatal care and 14.83% only after delivery, which again represents the low quality of care during prenatal care. A study performed in a city from the *Minas Gerais* State obtained similar results regarding the time of diagnosis of the pregnant woman.¹⁸

Although 67.36% of pregnant women undergo prenatal care and 25.04% are diagnosed during prenatal care, only 0.7% carry out the treatment properly, which is an alarming fact, since the treatment is available free of charge by the *SUS* to the patient. Given these data, a new approach with updating of health professionals is necessary, as it has the responsibility to investigate, diagnose, and offer subsidies so that the treatment is carried out properly at the right time, since the surveillance of diseases vertical transmission should be performed in the period when the intervention is still possible, and thus, reducing the rates of congenital syphilis.¹⁹

It is worth mentioning that the treatment is not only limited to the pregnant woman, but also all current sexual partnerships. On the contrary, it will be reinfected by having unprotected sex with the infected partner, which increases the risk of congenital syphilis infection by five times. In this study, it was possible to analyze the rates of treated sexual partners, with 7.5% being classified as treated and 74.78% as untreated, which again falls on the low quality of prenatal care.²⁰

About the cases of congenital syphilis in the municipality, 96.24% of these were notified less than 7 days old, which suggests that assistance to newborns vulnerable to infection in the maternity hospital has been expected. The notification of congenital syphilis has been mandatory since 1986, and despite having undergone several changes over time, it is now easy to understand and complete. It was possible to observe a drop in the number of reported cases between the years 2013 to 2015, a fact that can be associated with a real decrease in the number of cases due to the campaigns to eradicate the infection or underreporting.¹⁹

From the total number of children under one-year-old notified with congenital syphilis, a large part had a final

diagnosis of recent congenital syphilis. This episode may be related to the large number of newborns notified with syphilis in less than 7 days of life, since recent syphilis corresponds to cases of syphilis in children under 2 years old. The *Maceió* city did not report any cases of a child diagnosed with late congenital syphilis, in other words, from 2 years old, which points to an excellent screening in maternity wards and health units, since the cases are detected on time.^{12,17}

The amount of abortion and stillbirth due to congenital syphilis remains alarming in the municipality, although there are campaigns to prevent and eradicate the infection and these have been intensified in recent years, which shows the lack of assistance in the primary levels of health care, and also the non-adherence to prenatal care by pregnant women.¹⁹

Bearing the aforesaid in mind, it is important to underline that a line of care for children exposed to *T. pallidum* must be adjusted and implemented in all States, since the sequels of untreated or inadequately treated congenital syphilis are serious and can lead to death, contributing to an increase in infant mortality rates. The *Maceió* city, in turn, when implementing the line of care for congenital syphilis in health units, values the quality of care from prenatal care to outpatient and/or specialized follow-up.

CONCLUSIONS

Herein, the results prove that congenital syphilis is still far from being eradicated in the municipality, as the incidence rates are staying above the national average and the studied characteristics, both of congenital syphilis and of the maternal characteristics, refer to a precarious primary care network, with low resolution capacity in the cases in question, especially with regard to prenatal care, preventing follow-up for the diagnosis of syphilis and early intervention.

Given this alarming epidemiological scenario of syphilis in the municipality, it has already presented some responses to the population in the form of an investigation of the local reality of the disease and the attempt to reduce the number of cases of congenital syphilis, with the intention of at least reaching the rates recommended by the MH and subsequently, to achieve the elimination of the disease. The implementation of actions and strategies by the Municipal Health Department shows the concern of local authorities and the body of professionals involved in the health care process concerning the desire to improve the quality of service provided to risk groups, moreover, to contribute to a better quality of life for the child exposed to the disease.

Even so, it is suggested to carry out follow-up studies of pregnant women and children infected with syphilis, given that the reorganization of the care line, together with the *Comitê de Investigação de Transmissão Vertical*

[Vertical Transmission Investigative Committee] and the project "*Resposta Rápida à Sífilis*" [Rapid Response to Syphilis], they must bring favorable responses regarding the epidemiological scenario of congenital syphilis.

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