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Clinical and epidemiological profile of vertical transmission of syphilis in a referral hospital in the state of Alagoas

Perfil clínico-epidemiológico da transmissão vertical da sífilis em um hospital de referência do estado de Alagoas

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ABSTRACT

Introduction: Syphilis is an infectious disease caused by the bacterium *Treponema pallidum* that is transmitted by sexual contact or vertical transmission during pregnancy. When not treated in pregnant women, it can cause various fetal and congenital damages that can lead to severe clinical conditions. In Brazil, the incidence of syphilis in pregnant women has increased in the last decade and, consequently, the incidence of congenital syphilis. Thus, to reduce the number of cases of congenital syphilis, prenatal screening and correct treatment of syphilis in pregnant women and

their sexual partners is essential to avoid possible reinfections. Given this scenario, the study evaluates the epidemiological profile of reported cases of syphilis in pregnancy and, in parallel, congenital syphilis in a municipality in northeastern Brazil. Methodology: Retrospective, epidemiological, descriptive, cross-sectional nature of a quantitative approach of the documentary type. To define the population universe, a survey of syphilis cases recorded in the medical records of pregnant women attended at a reference maternity hospital in the state of Alagoas, from 2015 to 2019, was conducted. Results: We reported 216 pregnant women diagnosed with gestational syphilis within the time period studied and 171 cases of congenital syphilis reported in the same period; which demonstrates a vertical transmission rate of 79.1%. In addition, the ineffectiveness of health policies was noted, since even with 63.8% of pregnant women undergoing prenatal care, only 1.85% underwent complete treatment. Conclusions: health actions should improve the methods of approaching the population in terms of prevention and/or adherence to treatment for the control and prevention of new cases.

Keywords: Syphilis, Gestation, Transmission, Congenital.

1 INTRODUCTION

The transmission of syphilis, caused by the bacterium *Treponema pallidum*, occurs through sexual intercourse, by parenteral or mucosal exposure to blood, blood products or contaminated piercing-cutting instruments and through vertical transmission, via placenta, during pregnancy. When left untreated in pregnant women, it can cause fetal damage, such as miscarriage, late fetal losses, neonatal deaths, prematurity and congenital infection in babies can evolve with serious complications if not treated (NITIN et al., 2017; Dupin, 2016; SOUZA et al., 2018; Pilger et al., 2019; ENSARI et al., 2015).

Syphilis can be classified by the time of infection as newly acquired syphilis or late acquired syphilis; and if not treated correctly it can evolve in four stages, based on clinical manifestations, such as primary, secondary, latent and tertiary syphilis. Vertical transmission depends on the stage of maternal syphilis, the ones with the highest risk are the primary and secondary stages of the disease, in addition it is important to note that transmission can occur at any time of pregnancy (L. V., 2015; Cooper et al., 2018; Pilger et al., 2019; LINO et al., 2021).

The degrees of clinical manifestations of congenital syphilis may vary according to the stage of maternal syphilis, as well as prenatal treatment and gestational age. In view of this, the disease can be classified into two categories: early congenital syphilis or late congenital syphilis. Early congenital syphilis is usually identified at 3 months of age up to 2 years and courses with typical features that include: hepatomegaly and splenomegaly; anaemia; thrombocytopenia; jaundice; abnormalities in the eyes and ears; generalized edema; dystrophy and mucocutaneous lesions. Approximately 40% of children with early congenital syphilis who are not treated,

progress to late congenital syphilis that is usually diagnosed from the age of 2, which the clinical picture includes: syphilitic rhinitis; syphilitic vasculitis; interstitial keratitis that can progress to secondary glaucoma; neurosyphilis that can trigger hydrocephalus, deafness, mental delays, blindness, and musculoskeletal manifestations (ROWE et al., 2018; BRAZIL, 2019; MAGALHÃES et al., 2013; LINO et al., 2021).

In view of this, it is important to screen and monitor syphilis during pregnancy, through good prenatal care that will allow early diagnosis. The Ministry of Health recommends serological screening for syphilis during prenatal care, through the rapid treponemal test that should be performed during the first and third trimester of pregnancy. In cases with reactive results, the control of treatment and cure should be performed through a non-treponemal examination. It is imperative that the pregnant woman and the sexual partner are referred for a complete therapy with benzathine penicillin G, a first-line drug for the treatment of syphilis at any stage, in order to achieve control of congenital syphilis (BEZERRA et al., 2019; BRAZIL, 2019; SOUZA et al., 2018).

According to data from the Ministry of Health, there was an evolution of cases of congenital syphilis in Brazil between 2010 and 2018, from 2.4 to 9.0 cases per thousand live births, and the incidence rate of syphilis in pregnant women increased from 3.5 to 21.4 cases. In this period, acquired syphilis increased from 34.1 cases in 2015 to 75.8 cases per 100,000 inhabitants in 2018. In addition, it can be seen from the Information System of Notifiable Diseases (SINAN), that in relation to syphilis in pregnant women, the Southeast and South have the highest rates of notifications in Brazil. However, in relation to congenital syphilis, the Northeast and Southeast lead with the highest rates. In this context, it can be stated that syphilis, in addition to being a serious public health problem, has a constant evolution of its rates (BRASIL, 2019; PILGER et al., 2019).

Given the above, considering the importance of conducting studies on the vertical transmission of syphilis, due to the severe fetal and congenital damage that it can trigger, it is valid to conduct further research in this area, especially at the regional level, in order to evaluate the possible changes in the epidemiological growth of cases. Thus, based on the regional epidemiological profile of the disease, it is possible to trace new ways of improving prenatal care.

2 METHODOLOGY

The Research Ethics Committee (CAAE: 50414821.7.0000.5011) and the head of the Maternity School Santa Mônica in the city of Maceió previously approved this study.

This is an epidemiological, descriptive, cross-sectional study with a quantitative approach of the documentary type. It was carried out at the Santa Mônica Maternity School (MESM), based on the collection of primary data from the medical records, belonging to the Medical File and Statistics Service (SAME) of the hospital.

This research was carried out in the city of the capital of the state of Alagoas, Brazil. The municipality has a territory divided into fifty neighborhoods and eight administrative regions. In 2019, it had an estimated population of 1,018,948. The Municipal Human Development Index (MHDI) in 2019 was 0.734, being considered of medium development. The MHDI evaluates the same dimensions of the Global Human Development Index – longevity, education and income – ranging from 0 to 1, but considers data from Brazilian municipalities (IBGE, 2023).

The data were collected by the researcher of the study who used the medical records of all pregnant women notified with gestational syphilis or congenital syphilis, in the period from January 2015 to December 2019. For the definition of the sample analyzed, all reported cases were included and medical records with incomplete, illegible data and those that were unavailable for any reason or that did not belong to the aforementioned time period were excluded. After data collection, there was verification for removal of duplicates, subjects who did not live in the municipality, and cases discarded by epidemiological surveillance.

Since 2011, the Ministry of Health has made available in Brazil, non-treponemal tests, such as VDRL (Venereal Disease Research Laboratory) and treponemal tests, such as FTA-Abs (Treponema Fluorescent – Absorption) for the diagnosis of syphilis. Screening occurs in a decentralized way, that is, the population has rapid tests in the local health unit. During prenatal care, diagnostic tests are ordered in the first and third trimesters, and include serology for syphilis with screening for both the pregnant woman and her partner. In addition, during hospitalization for childbirth or curettage, serological tests for syphilis in the mother are also performed. In the case of positive serology of the mother, after birth, the infant test is also collected in the hospital (PILGER et al., 2019).

The variables used to calculate the detection rate and incidence of congenital syphilis and syphilis in pregnant women were year, number of confirmed cases per year, number of live births in the year and number of total population in the year. The variables analyzed to define the epidemiological profile were: pregnant woman, self-declared skin color (white and others – black, brown, yellow), schooling (incomplete elementary school, complete elementary school or more), age, treatment of the pregnant woman, complete scheme according to the clinical phase, prenatal care, time of diagnosis of the mother (prenatal, delivery/curettage).

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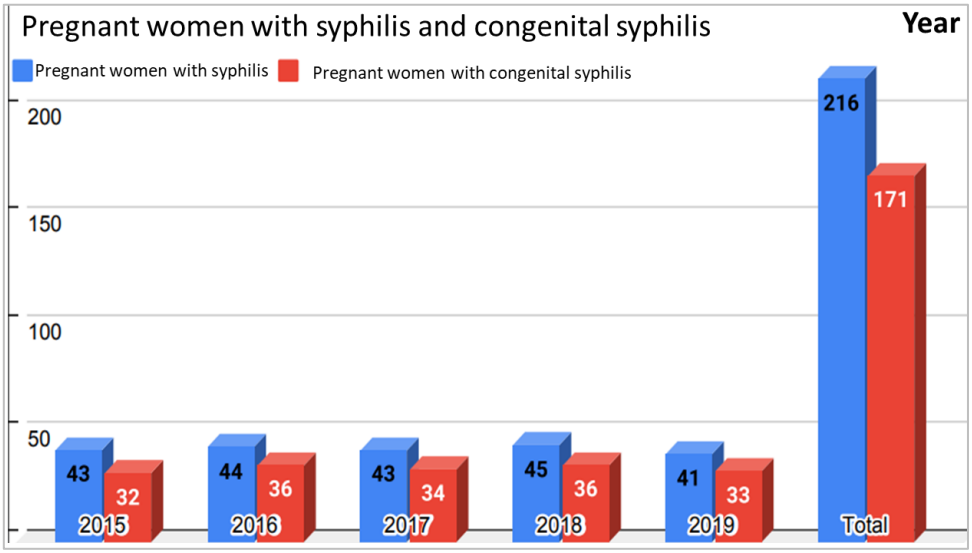
Initially, the information was collected and recorded in an instrument that contained questions about sociodemographic and epidemiological aspects of syphilis in pregnant women, based on the data contained in the medical records and according to the variables sought. The information collected was entered and stored in the R software (R, 2020). Subsequently, they were statistically characterized and presented in the format of tables and graphs as results of the research according to the formulas recommended by the Brazilian Ministry of Health to estimate the detection rates of cases of syphilis in pregnant women and acquired syphilis, as well as the rate and incidence of congenital syphilis. For the descriptive statistical analysis, we considered the quantitative data that will be included in the form of mean and percentage. The qualitative variables will be presented in the form of frequency tables.

3 RESULT

In the period from 2015 to 2019, 216 cases of syphilis in pregnant women and 171 cases of congenital syphilis were identified at the Santa Monica Maternity School, which reveals a significant rate of vertical transmission of the disease of 79.1%. Graph 1 shows the distribution of these notifications over the period studied and shows an almost constant behavior of the incidence of vertical transmission of syphilis. However, the year 2016 registers a coefficient of 81.8%, standing out as the moment of the highest rate of occurrence. These data highlight the need for health education actions aimed at protected sexual practice and family planning (MAGALHÃES et al., 2013; PILGER et al., 2019).

Graph 1: Distribution of detection rates of cases of gestational syphilis and congenital syphilis, according to the year of notification



Source: Prepared by the author, from the data obtained through the analysis of medical records, at the Santa Mônica Maternity School Hospital (MESM), in 2022

Table 1 presents the data related to maternal sociodemographic profile at the time of notification. Regarding age, the highest percentage of cases is observed in women between 20 and 34 years of age, representing a total of 63.4% (N=137) of the records. This age group, because it represents the peak of the reproductive phase, justifies the higher number of reported cases of the disease. In addition, this finding is compatible with that found in most national epidemiological studies of the infection. However, it is still possible to notice a considerable frequency of pregnant adolescents with syphilis, 26.8% (N=58), data that coincide with the previous study conducted in 2013 in Ceará, which can be attributed, in addition to other factors, to the early and unprotected initiation of the sexual life of young people (COSTA et al., 2013; MAGALHÃES et al., 2013; PILGER et al., 2019).

Regarding the distribution of cases of gestational syphilis according to self-declared race/color, it is observed that mulatto women (N=199; 92.1%) are the most affected, followed by black (N=10; 4.62%) and white (N=5; 2.31%). In SINAN, in the same time interval, it presents a predominance of mulattos, however it is followed by white and black women, disagreeing in a partial way with the results found in the present research.

Another criterion evaluated was the level of education of each pregnant woman, in which it was observed that the number of patients with them, evaluated in the time interval, who are illiterate or who did not complete elementary school corresponds to 61.5% of the total (N=133). This data coincides with previous studies such as the one conducted in 2016 in the state of Minas Gerais, which demonstrated the predominance of women (51.9%) with gestational syphilis in illiterate or incomplete elementary school. Analyzing table 1, regarding the performance of prenatal follow-up, it is observed that 63.8% (N=138) of the pregnant women underwent prenatal care. In addition, 24% (N=52) did not undergo prenatal care and 12% (N=26) were recorded blank or ignored. Moreover, with regard to treatment, it is noted that only 1.85% (N=4) of the mothers underwent the appropriate therapy for the disease. It is also observed that 26.8% (N=58) did not undergo treatment and 64.3% (N=139) underwent inadequate therapy. Based on this fact, it appears that about 98.15% (N=212) of the total number of pregnant women had inadequate prenatal care in screening, follow-up and treatment (GODOY et al., 2019; LIMA et al., 2019; PILGER et al., 2019)

Table 1:

Age group	2015	2016	2017	2018	2019	Total
10-19	16	14	11	5	12	**58**
20-34	23	25	33	30	27	**137**
35-49	6	5	4	4	2	**21**
Race/color						**Total**
White	1	1	1	0	2	**5**
Black	0	2	2	3	3	**10**
Pardon	42	34	33	45	45	**199**
Indigenous	0	2	0	0	0	**2**
Education (Mother)						**Total**
Illiterate	0	0	1	2	0	**3**
Incomplete Elementary School	22	22	29	28	29	**130**
Completed elementary school	8	1	1	1	2	**13**
Incomplete high school	4	1	1	3	5	**14**
Completed high school	13	12	5	14	5	**49**
Incomplete higher education	1	1	1	0	1	**4**
Not applicable	1	2	0	0	0	**3**
Prenatal care						**Total**
Yes	31	24	25	23	25	**138**
No	9	7	17	12	7	**52**
Ignored	3	5	2	3	13	**26**
Treatment						**Total**
Adequate	0	0	0	2	2	**4**
Inadequate	39	22	38	25	15	**139**
Not done	13	14	4	8	19	**58**
Ignored	1	3	2	4	5	**15**

Source: Prepared by the author, from the data obtained through the analysis of medical records, at the Santa Mônica Maternity School Hospital (MESM), in 2022

The health care of the maternal-fetal binomial promoted through prenatal care aims to ensure gestational development, capable of ensuring the birth of a healthy child without

repercussions for maternal health. For this, it is stipulated that the quality gestational follow-up must have the early capture of the pregnant woman, ensuring the diagnosis and timely treatment of the diseases, favoring better gestational outcomes. (SOUZA et al., 2018; BRAZIL, 2019; LIMA et al., 2019; LINO et al., 2021)

In order to ensure the necessary assistance regarding gestational syphilis and congenital syphilis, in 2009, the Ministry of Health (MH) joined the Pan American Health Organization (PAHO) and launched the regional initiative for the elimination of vertical transmission of HIV and syphilis in Latin America and the Caribbean. In Brazil, the Ministry of Health recommends a series of diagnostic routines and care protocols for the follow-up of children born to women diagnosed with syphilis during pregnancy, childbirth or puerperium. The approach adopted is based on the following aspects: diagnosis and treatment for syphilis; clinical, laboratory and radiographic signs of syphilis infection in the newborn; and comparative analysis of the titration of the maternal Venereal Disease Research Laboratory (VDRL) test and the conceptus at the time of delivery (BRASIL, 2019; ENSARI et al., 2015; MAGALHÃES et al., 2013; LIMA et al., 2019; PILGER et al., 2019).

In addition, the Ministry of Health defines that the appropriate therapy used should be instituted for pregnant women who present positive VDRL or RPR test in any titration and in the absence of confirmatory test (treponemal serology). Benzathine penicillin G is used at a dose of 2,400,000 IU/IM, depending on the clinical form of the disease. In addition, it advises pregnant women to avoid sexual intercourse until their treatment is complete. In addition, it stipulates the realization of the monthly cure control through the VDRL, and in cases in which the interruption of treatment occurs or the titrations of the control exam increase, a new treatment should be instituted (BRASIL, 2019).

The findings of the study conducted in Alagoas allowed to identify a prevalence of cases of gestational syphilis, if compared to the total of occurrences of congenital syphilis recorded, which points to the occurrence of diagnosis and treatment during the gestational period. However, even with the knowledge of high transmissibility, outcomes and availability of treatment, the rate of inadequate or unperformed treatment, as well as congenital syphilis remain high, which indicates failure in the prenatal segment, diagnosis and treatment predicted by the MS. (SOUZA et al., 2018; BRAZIL, 2019; MAGALHÃES et al., 2013; LIMA et al., 2019; PILGER et al., 2019).

PAHO considers the minimum offer of six consultations for prenatal care to be adequate. However, through the results of Alagoas, a total of fifty-two pregnant women who did not undergo any consultation and an amount of one hundred and thirty-nine women who were submitted to

inadequate therapy are evidenced; demonstrating the lack of supply and quality of care to pregnant women. When analyzing this bias, the cohort study conducted in the Federal District in 2013 remains compatible with the results of Alagoas and converges to the hypothesis that the minimum number of prenatal consultations is not enough to ensure quality care and ensure adequate treatment with regard to gestational and congenital syphilis. (ENSARI et al., 2015; MAGALHÃES et al., 2013; LIMA et al., 2019; PILGER et al., 2019).

In this sense, the maternal academic profile found in the municipality of interest also reflects the social context of the infection, indicated as frequent in individuals of greater social vulnerability, since there is a higher incidence in housewives with less education. This context converges to the discussion addressed in other studies that relate the non-performance of prenatal care and the difficulty of access to information and education to the level of education of pregnant women. In view of this, it can be stated that there was a failure both in the uptake and in the segment predicted by the MH of pregnant women with syphilis during the prenatal period, since most of them were able to perform prenatal follow-up, however less than 2% underwent adequate therapy. Thus, educational actions should have a greater focus on this population group, being disseminated and worked from school age so that the capture and search for prenatal care is also of interest to the pregnant woman, thus, armed with information this could actively contribute to the treatment and favorable outcomes for the fetus (SOUZA et al., 2018; BRAZIL, 2019; ENSARI et al., 2015; MAGALHÃES et al., 2013; LIMA et al, 2019; LINO et al., 2021; PILGER et al., 2019).

At the national level, the cross-sectional cohort study conducted in 2019 showed a pattern similar to that found in Alagoas, in which most pregnant women underwent prenatal care; however, only 4% carried out the treatment adequately. Inadequate treatment is the aspect that contributes most significantly to the persistence of high rates of congenital syphilis, being a reality lacking focus of public agencies (MAGALHÃES et al., 2013; LIMA et al., 2019);

Another relevant aspect refers to the treatment of the partner of the infected pregnant woman. In Brazil, the current Informative Note No. 2 - SEI/2017 – DIAHV/SVS/MS, of the Ministry of Health, does not consider the treatment of the partner for the purpose of defining appropriate treatment and cases of congenital syphilis. On the other hand, FEBRASGO (Brazilian Federation of Gynecology and Obstetrics Associations) takes a position in 2018 and recommends that the sexual partner of the pregnant woman diagnosed with syphilis should be summoned by the health service for guidance, clinical and laboratory evaluation, as well as for treatment (BRASIL, 2019; FEBRASGO, 2019; ENSARI et al., 2015; LINO et al., 2021) .

In this context, the relevance of the treatment of the partner of the pregnant woman with syphilis is undeniable, considering that the constant exposure to *Treponema pallidum* favors the risk of reinfection and prevents the breaking of the chain of transmission of the disease and reinforces the increased incidence of vertical transmission. The absence of treatment and segment of the pregnant woman's partner is a risk factor that should be reconsidered by the Ministry of Health, since its objective is the eradication of vertical transmission of syphilis, this variable should not be ruled out (LIMA et al., 2019; LINO et al., 2021; PILGER et al., 2019).

From the above, it is noted that the search for the elimination of congenital syphilis can be carried out by the municipalities through projects in accordance with the recommendations of the WHO. Prevention actions aimed at women of childbearing age, interruption of the chain of transmission of gestational and acquired syphilis, consolidation of prenatal procedures for the capture and follow-up of pregnant women are of fundamental relevance for the control of the disease.

4 CONCLUSIONS

Syphilis is a re-emerging disease in Brazil as a whole. Therefore, the increase or maintenance of cases of gestational and congenital syphilis over the years demonstrates the need to develop effective actions aimed at its control. For this reason, the present study was able to identify evidence that demonstrates the failure of the health system for the prevention and treatment of gestational syphilis, since it was noted the maintenance year by year in the quantitative registration of gestational syphilis in the period analyzed; as well as the quality of prenatal care, since 63.8% of the pregnant women were followed up during pregnancy, but only 1.85% underwent appropriate therapy.

In addition, it is essential to develop effective actions aimed at safe sexual practice, prevention and correct treatment of syphilis when it occurs, through the improvement in the quality of prenatal care, to consequently reduce and annul the existence of congenital syphilis.

Another factor that needs to be prioritized is family guidance and encouragement for the partner to participate in prenatal care, considering the relevance for the success of pregnancy and for the reduction of possible complications. The introduction to the health system, through male prenatal care, expands the care to the individual, being the gateway to multiprofessional care, prevention and health promotion; this is because most men do not perform medical follow-up, seeking only in extreme cases and thus enables unwanted complications for the pregnant woman and the fetus (BOTTURA et al., 2022; SOUZA et al., 2018).

From the data provided by the research it is possible to conclude that gestational and congenital syphilis persists as a public health problem, so as to be associated with greater social vulnerability and lack of knowledge of the population regarding the severity and repercussions of the disease. For this reason, further studies are essential in order to define the epidemiological profile of the disease in the country, as well as to improve methods of approaching the population in terms of prevention and/or adherence to treatment.

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