

# Prevalence of Congenital Syphilis in Northern Pará: Chronological Analysis of the Years 2014 To 2018

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**Abstract**— Objective: to analyze the prevalence of congenital syphilis in the State of Pará from 2014 to 2018. Method: This is a descriptive study with a quantitative approach of all cases of congenital syphilis reported by the Acute Notification Information System (SINAN) and the Living Born Information System (SINASC) in the period from 2014 to 2018 where the results are presented in the form of graphs and tables. Result: The frequency of congenital syphilis in the State of Pará showed an increasing trend in the period from 2014 to 2018, with 2017 showing a higher number of cases, totaling 5.7 cases per thousand live births. In 2018 there was a decrease from 5.7 to 5.5 cases per thousand born alive, but still surpassing the goal set by the ministry of health and remaining an old public health problem. CONCLUSION: The study points out the need for greater involvement of health sectors and professionals in the eradication of the disease in the state of Pará, promoting primary actions of prevention and awareness of the severity of congenital syphilis for the mother and the newborn.

**Keywords**— Congenital syphilis, Live birth, Epidemiological Surveillance.

## I. INTRODUCTION

Syphilis is a systemic infectious disease that presents itself as a challenge to society because, despite the existence of effective and low-cost treatment, it remains a serious public health problem. It is a sexually transmitted infection (STI) of etiological agent *Treponema pallidum*, caused by the spirochete and highly pathogenic bacteria (Silva et al., 2017).

The mode of transmission can be during sexual intercourse without the use of condoms, in pregnancy or at the time of delivery and blood, the incubation period varies from 10 to 90 days (on average 21 days), its transmissibility is through the lesions (treponema) being the main form and vertical at any stage of pregnancy, since when performing the treatment all right is to be cured, the antibodies produced are not protective, ie, new exposure generates new infection (Cardoso, 2018 & Brazil, 2019).

The clinical manifestations present in different stages: primary, secondary, latent and tertiary syphilis, with higher risk of transmission in primary and secondary classifications. The inclusion of gestational syphilis (GS) as a compulsorily notifiable STI is justified by its high prevalence and rate of vertical transmission that can vary from 30% to 100% if untreated or inadequately treated (Marques et al., 2018).

The epidemiological situation of syphilis worldwide is variable, as global estimates indicate, especially in the gestational period, syphilis leads to over 300,000 fetal and neonatal deaths per year in the world and increases the risk of premature death in another 215,000 children, in the last decade in Brazil, there has been an increase in notifications of cases of syphilis in pregnant women and congenital women (Brazil, 2018). It is estimated that on average each year more than 12 million new cases of syphilis occur in the adult population and of these, more than 2 million are pregnant women (Rojas, 2018).

The choice of this theme is justified by the need to make a survey of the prevalence of syphilis in the last five years, through the considerable increase of congenital syphilis in the State of Pará, bringing with it the recrudescence of stillbirths and their severe sequelae, which according to the Epidemiological Bulletin of Syphilis the North of the country reached the incidence rate of 5.5 per 1,000 live births and Pará registered 5.1 (Rojas, 2018).

Through this, this study becomes essential in order to contribute to the discussion on this topic and enable the knowledge of real values in the state of Pará. In addition to following the restructuring of the proposals to confront syphilis in this region. This study aims to inform the

characterization of risk groups for this pathology, adding the numbers of withdrawal from treatment, the lack of inclusion of partners and family barriers, thus enabling the alarming increase of congenital syphilis. In view of this, the following research question arises: What are the factors for the occurrence of this pathology in the State of Pará?

In this sense, the objective was to analyze the prevalence of congenital syphilis in the State of Pará from 2014 to 2018.

## II. METHOD

This is a descriptive epidemiological study, with a quantitative approach, whose secondary data were obtained by consulting the database of the Notification Aggravates Information System (SINAN) directed to the state of Pará, and considering updated data from the Living Births Information System (SINASC) in order to contribute to the statistical calculation.

The data collection was carried out through a documental research, the samples consisted of congenital syphilis notifications in the years 2014 to 2018, through SINAN and SINASC, using the variables as: child's age, mother's age, ethnicity, schooling, mothers and partners who performed or not the prenatal.

Data on live newborns, less than 7 days old until 12 years old, with positive result for syphilis in the years 2014 to 2018, classified, and reported and registered as congenital syphilis were included, according to data extracted from SINAN. Also all children born to mothers with syphilis (from clinical and/or laboratory evidence), diagnosed during pregnancy, delivery or puerperium.

We excluded cases of children over 13 years of age, born dead reported with congenital syphilis, and data from years before 2014, as well as cases of gestational syphilis and acquired syphilis.

The steps of data collection and analysis were: extracted from SINAN, notifications of Congenital Syphilis published in 2014 to 2018, soon after the exploration of this material was carried out, condensing the information to perform the descriptive statistical analysis of all the data that were transcribed into a spreadsheet in the Microsoft Excel program of Windows version 2013. To obtain the prevalence, the ratio between the number of existing cases of Congenital Syphilis in a given year of diagnosis and the total number of live births of mothers living in the same place, reported in the period from 2014 to 2018 divided by the total number of exposed newborns in the same year and multiplied by 1000, thus

tracing the results, and preparation, analysis of tables and graphs.

The following formula was used to calculate the prevalence estimate:

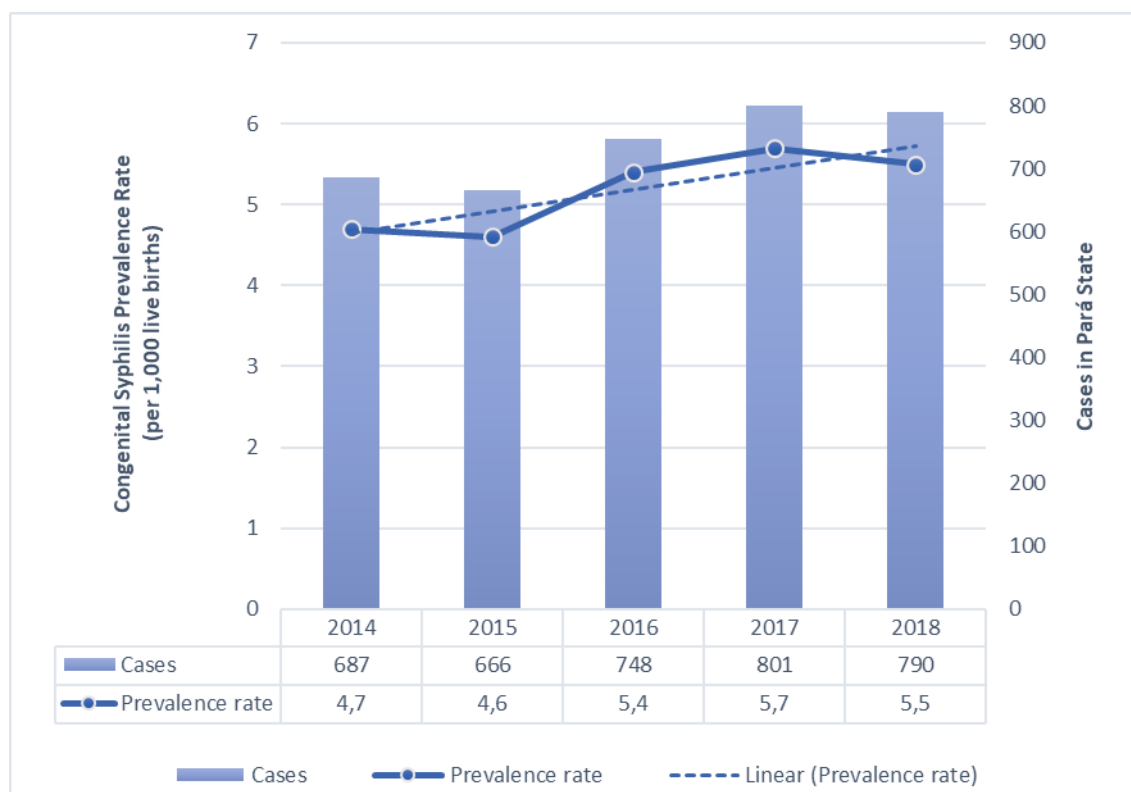
$$\text{Prevalence rate} = \frac{\text{n}^\circ \text{ of existing cases}}{\text{n}^\circ \text{ of exposed people}} \times 1000$$

Since the secondary data presented here are available to those who are interested without any form of access restriction in the information system of aggravated notifications, there was no need for approval of the Research Ethics Committee.

### III. RESULTS

The results of this study show that when investigating the number of cases of Congenital Syphilis (CS) in the State of Pará according to SINAN data, 3,692 cases of CS were reported between the years 2014 and 2018, with 2017 showing a higher absolute number of cases with n= 801, with a prevalence rate of 5.7% and the linear trend indicates an increasing straight line (Graph 1).

Graph 1 - Congenital syphilis cases in children under one year of age and prevalence rate (per 1,000 live births) per year of diagnosis in the State of Pará, between the years 2014-2018.



**SOURCE:** Elaborated by the authors of the research, with data MS/SVS/DCCI - Department of Chronic Conditions Diseases and Sexually Transmitted Infections. Notification Aggravated Information System - SINAN Net/ Living Born Information System - SINASC. Note: (1). Preliminary data for the last 5 years.

Regarding the profile of mothers notified with congenital syphilis in Pará, it was 50.3% in the 20-29 age group, 31.8% had incomplete primary education, 73% of the brown color or 15.3% were indigenous, 82.5% performed prenatal, the moment of diagnosis 40.9% was

during prenatal, however 33.6% also went to the process of delivery or curettage and 19.1% after delivery, which increases the risk of transmission of the disease to the newborn (TABLE 1).

Table 1 - Cases of congenital syphilis according to age, education, race or color of the mother, prenatal performance and the moment of diagnosis of maternal syphilis. Pará, 2014-2018.

Variables	NC	%
<b>Mother's age group</b>		
10 a 14 anos	59	1,5
15 a 19 anos	1.087	27,6
20 a 29 anos	1.976	50,3
30 a 39 anos	502	12,7
40 anos ou mais	43	1,0
Ignored	259	6,5
<b>Mother's education</b>		
Illiterate	28	1,0
1st to 4th series incomplete	329	12,5
4th incomplete series	150	5,7
5th to 8th series incomplete	836	31,8
Complete Elementary School	321	12,2
Incomplete High School	473	18,0
Complete High School	458	17,4
Incomplete College	26	0,9
Complete College	25	1,0
Not applicable	26	1,0
Ignored	1.034	12,5
<b>Breed or Mother's Color</b>		
White	204	4,6
Black	96	2,1
Yellow	53	1,1
Brown	3.230	73,0
Indigenous	677	15,3
Ignored	162	3,6
<b>Prenatal Care</b>		
Yes	3.059	82,5
No	526	14,1
Ignored	121	3,2
<b>Momento do diagnóstico da Sífilis Materna</b>		
During prenatal	1.516	40,9
Moment of birth/curetage	1.246	33,6
After the birth	711	19,1
Not realized	43	1,1
Ignored	190	5,1

Source: Elaborated by the authors of the research, with data MS/SVS/DCCI - Department of Chronic Conditions Diseases and Sexually Transmitted Infections. Notes: (1) Data until 06/30/2019; (2) Preliminary data for the last 5 years. Legend: Number of cases (NC).

As for the groups at risk for this pathology, the highest number of cases in children under 7 days of life was evidenced, presenting 95%, 2.4% in children between 7 and 27 days and 1.4% with ages between 28 and 364 days, already in relation to mothers, it is noted that, 54% of

inappropriate treatments occurred during the last five years, another group identified were the partners, because although there is availability of treatment for men, in the first place 61% of partners were not treated according to the cases of CS (Table 2).

Table 2 - Cases of congenital syphilis according to the child's age, the treatment scheme of mothers and partners. Pará, 2014-2018.

Variables	NC	%	
<b>Child's age</b>			
Less than 7 days	3.546	95,6	
7 to 27 days	91	2,4	
28 to 364 days	55	1,4	
1 year	7	0,1	
2 to 4 years	6	0,1	
5 to 12 years	1	0,0	
Ignored	0	0	
<b>Maternal treatment scheme</b>			
Adequate	351	9,4	
Inadequate	2.021	54,5	
Not realized	881	23,7	
Ignored	453	12,2	
<b>Treated partner</b>			
	<b>NC</b>	<b>%</b>	
Yes	702	18,9	<b>SO</b>
No	2.274	61,3	<b>UR</b>
Ignored	730	19,6	<b>CE:</b>
			Elab

orated by the authors of the research, with data Source: MS/SVS/DCCI - Department of Chronic Conditions Diseases and Sexually Transmitted Infections. Notes: (1) Data until 06/30/2019; (2) Preliminary data for the last 5 years. Legend: Number of Cases (NC).

#### IV. DISCUSSION

According to data from the Syphilis Epidemiological Bulletin in (2016), in Brazil in the last five years a constant increase in the number of cases of syphilis in pregnant women, congenital and acquired, was observed, which can be attributed, in part, to the increase in the coverage of testing, with the increase in the use of rapid tests, reduction in the use of condoms, resistance of health professionals to the administration of penicillin in Basic Care, worldwide shortage of penicillin, among others. In addition, the improvement of the surveillance system can be reflected in the increase of notified cases (Brazil, 2016).

The studies by Henderson (2018) and collaborators, conducted in a reference maternity ward in the State of Pará, state that the number of syphilis cases found in this region exceeds those of other national states, i.e., notification rates in the North remain high.

When this study was compared with the research of Trevisan & Collaborators (2018), conducted in a municipality of Paraná also prevailed between 20 and 29 years a higher frequency of notifications at that age. Lafeta (2016) explains that it is in this age group that the woman exercises her full sexuality and the peak of the reproductive phase. The public most affected and adolescents with the infection is noticeable, and they are

beginning early and unprotected sexual activity (Souza; Rodrigues; Gomes, 2018).

Moreover, because they are a public with low schooling, they are more exposed to the disease, as shown in the research of Silva (2019), that the incomplete level of education influences the knowledge on how to prevent Sexually Transmitted Infections (STIs).

Marques et al. (2018), corroborate that most of the cases occurred in brown mothers and this result, becomes a disadvantage causing problems of social inequality of access to health services, thus influencing in the adequate prenatal care mainly the mothers who are indigenous.

It is possible to observe in other research that the diagnosis is being made in the prenatal period, more in a late period compromising the assistance to the quality treatment to this pregnant woman, because the syphilis can be transmitted to the baby in the ninth week of pregnancy and this delay in the diagnosis can lead to the identification of the cases only during the delivery, curettage or postpartum, thus increasing the chances of congenital syphilis occurring (Terra, 2019; Cardoso, 2018; Araujo et al., 2018; Oliveira et al., 2017).

Regarding the age of newborns notified with congenital syphilis, it is evident in the research of Padovani & Collaborators (2018), states that they are diagnosed at birth with a few days of life, these data compare with those published in the Epidemiological Bulletin, being the majority of newborns diagnosed with congenital syphilis in the first week of life (Brazil, 2016).

To reduce the risk of newborns being diagnosed at birth with congenital syphilis, it is essential to perform quality follow-up during prenatal care, identifying early and contributing significantly to reduce the health risks of pregnant women and the fetus (Silva et al., 2017).

In this study in relation to inadequate maternal treatment, similar data shown in a survey in Palmas Tocantins over a period of five years were identified flaws with 43.8% were inadequately treated, which explains the high incidence in this municipality (Costa Neto et al., 2018).

According to Menegazzo & Collaborators (2018), all pregnant women received the treatment, however 85% was considered inadequate and also the partners were not treated, which corresponds as a major error in prenatal care and implying increased vertical transmission of the disease.

It is noteworthy that in this study a high number of untreated partners, the same was evidenced in a survey conducted in Porto Velho shows that the prenatal follow-

ups were made the treatment of the pregnant woman properly, plus 56.86% of the partners were not carried out, since it is of paramount importance to perform the correct treatment of the couple to prevent complications for the baby (Silva et al., 2017).

With this study it was possible to determine the following factors related to the frequency of congenital syphilis, such as the diagnosis made during prenatal care, more in a late period, thus compromising the quality of care for this pregnant woman.

Another study points out failures in treatment during prenatal care and states that it has been one of the most relevant risk factors associated with high prevalence of the disease (Costa Neto et al., 2018). Silva & Fernandes (2015) corroborate that in order to reduce this failure, measures must be taken at different levels of public administration, thus promoting initiatives to improve prenatal care and efficiently ensuring the prevention and treatment of this disease.

It was possible to notice the large number of untreated partners, for Melo (2019), emphasizes in the results of his research about the devaluation that men have with health services, because they constitute as a space more of the female presence, with that they do not prioritize the prevention and only make the search for the service when it comes to presenting the symptoms, so early diagnosis and treatment is not performed.

Low schooling affects the limitation of knowledge about preventive measures of STIs, so the population does not have access to information about this infection, so these results compare with the data from Azevedo et al., (2017), in which it identifies risk factors related to syphilis infection such as low schooling, teen pregnancy and limited access to health services.

## V. CONCLUSION

The findings of this study helped analyze the Congenital Syphilis Prevalence Rate, as well as its increase in the absolute number of cases in the State of Pará during the last five years, as evidenced by the linear trend that indicates an increasing straight line and requires immediate interventions in order to minimize its occurrence.

It was possible to characterize the main factors, as well as the risk groups, observing that the deficiency in prenatal care, and late diagnosis of pregnant women contribute to a higher occurrence of syphilis cases in children under seven days old, as well as the lack of participation of the partner



of these pregnant women in the treatment process, contributing to a possible reinfection of the mothers.

The study also points out the need for greater involvement of health sectors and professionals in the prevention, diagnosis, and treatment of congenital syphilis, through assistance protocols, as described in the guidelines and recommendations made available by the Ministry of Health. Thus, enabling a possible eradication or decrease in the prevalence rate of the disease in the state of Pará, however, the need to promote primary actions of prevention and awareness of the severity of congenital syphilis for the mother and the newborn is reiterated.

Therefore, it is necessary to train the multiprofessional team, which has a very important role in promoting changes in the disease picture. Reflecting on an effective and adequate prenatal care, allowing a closer relationship between professional and user, acquiring a more critical and humanized look, especially in relation to the partners of infected pregnant women, contributing so that they can become aware and adhere to the treatment.

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