

CONGENITAL SYPHILIS AND ASSOCIATED FACTORS IN ANÁPOLIS - GOIÁS, 2017-2021

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ABSTRACT

Congenital syphilis is an epidemiological case of increasing progression over the years. Reports of confirmed cases of congenital syphilis are frequently reported worldwide.

The Midwest region has scarce literature associated with the discovery of epidemiological parameters. Thus, the main objective of this work is to identify the prevalence and factors associated with congenital syphilis in the city of Anápolis - Goiás, between the years 2017 to 2021.

A concave curve was discovered in this period, showing a progressive increase and subsequent progressive decay, over the years studied, for the Midwest region.

These results showed a prominent place for the region of Anápolis (third place), among all other cities studied in the Midwest region. Despite presenting results, further studies on the city of Anápolis are needed to explore epidemiological knowledge about the region.

KEYWORDS: NOTIFICATIONS; MIDWEST; EPIDEMIOLOGY; PREVALENCE.

INTRODUCTION

Transmitted by the bacterium *Treponema pallidum*, syphilis is known as a Sexually Transmitted Infection (STI), transmitted by a microaerophilic pathogenic spirochete, belonging to the order Spirochaetales, of the family Treponemataceae. This pathology can present in different stages (primary, secondary, latent and tertiary) and present with different clinical manifestations. It has a worldwide distribution and is characterized by being an infectious, systemic disease, with a chronic evolution and rapid dissemination^{1,2}.

Considered a pathology of systemic and chronic evolution, it can be acquired through unprotected sexual intercourse with an infected person, blood transfusion, or even transmitted from mother to child at any stage of pregnancy or at delivery (congenital form), with high vertical transmission rates².

Congenital syphilis is caused by the transmission of the *T. pallidum* agent from an untreated or inadequately treated infected pregnant woman to her fetus via the placenta. The determining factors of this type of transmission are the stage of the mother's disease and the exposure time of the fetus in the uterus. Epidemiological estimates show that the rate of vertical infection in untreated women is approximately 70%, being 30% in the late phase of infection and reaching 100% in the early stages³.

According to data from the 2016 Epidemiological Bulletin on syphilis, the progression of acquired syphilis, between 2014 and 2015, had an increase of 32.7%, syphilis in

pregnant women, 20.9% and congenital 19%^{4,5}. According to notifications to the Information System on Diseases and Notification (SINAN), around 169,546 cases of syphilis in pregnant women were recorded during the period from 2005 to 2016, in Brazil⁵. The progression of cases is the result of insufficient preventive actions and treatment. Based on this, care for this population should be prioritized, with a focus on prenatal care. In this context, an accounting of cases in microregions such as Anápolis-Goiás can be of paramount importance, in order to, associated with other measures, reduce the prevalence of congenital syphilis throughout the national territory.

Based on this information, a numerical estimate of congenital syphilis cases in Anápolis - GO, in the period 2017-2021, emphasizes the real situation of the municipality and, in possession of this profile, it is possible to outline actions and strategies for focus groups. In this way, the possibilities of prevention can be increased and thus contribute to the reduction of the incidence of congenital syphilis. Thus, the main objective of this work is to identify the prevalence and factors associated with congenital syphilis in the city of Anápolis - Goiás between the years 2017 to 2021.

METHODS

This research is a retrospective descriptive epidemiological study, which aims to know the profile of congenital syphilis in the city of Anápolis, from 2017 to 2021. Data from SINAN, available in DATASUS, from 2017 to 2021 were

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consulted. In order to avoid notification delay errors, we analyzed the data available until 2021, which is considered the last year for which complete data are available.

In order to identify published studies on congenital syphilis, in the present study, a bibliographic survey of scientific articles published in the ScienceDirect, PubMed, Medline, Web of Science, EMBASE, LILACS, Scielo and Google Scholar databases was carried out, between the years from 2006 to 2022. For the research, the following descriptors were used: "Sífilis", "Sífilis congênita", "Sífilis e Anápolis", and their corresponding words in English: "Syphilis", "Congenital Syphilis", "Syphilis and Anápolis". The search took place between April and May 2022, totaling 10 works, of which 10 were selected for the development of this research.

After data collection, analysis and interpretation, the Microsoft® Excel 2020 program was used to tabulate data and expose the real situation in the city of Anápolis, with representation of the incidence of congenital syphilis through tables and graphs.

Due to the fact that it is a public domain database, it was not necessary to submit it to the Research Ethics Committee.

RESULTS

3.1. THE YEAR 2019 WAS THE MOST RECORDED IN CASES OF CONGENITAL SYPHILIS IN BRAZIL

The results for confirmed cases of congenital syphilis throughout Brazil are shown in Table 1.

The year of greatest evidence in numbers, in the Midwest region, is the year 2019 (n = 365), followed by the year 2018 (n = 360) and 2020 (n = 320). However, we can see a curve in Figure 1, represented by the distribution of confirmed cases over the years studied by our research.

Year of Diagnosis	Midwest region	Total
2016	6	6
2017	295	295
2018	360	360
2019	365	365
2020	320	320
2021	157	157
Total	1503	1503

Table 1: Congenital syphilis - Confirmed cases reported in the Notifiable Diseases Information System in Brazil*
 Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification;
 Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.



Figure 1: Representation of the distribution of a five-year period (2016 to 2021) of confirmed cases of congenital syphilis in the Midwest Region
 Source: Ministry of Health/SVS- Diseases Information System - SINAN NET

3.2. THE MONTH OF APRIL WAS THE MOST RECORDED MONTH IN THE PAST 5 YEARS IN BRAZIL

The distribution of results referring to the months compiled in the last five years is represented by Table 2.

The number of confirmed cases in April was 169, followed by March (n = 150), June (n = 147) and May (n = 141).

Month of diagnosis	Midwest region	Total
January	111	111
February	136	136
March	150	150
April	169	169
May	141	141
June	147	147
July	129	129
August	122	122
September	107	107
October	87	87
November	110	110
December	94	94
Total	1503	1503

Table 2. Congenital syphilis - Confirmed cases by month of diagnosis and region of notification*
 Source: Ministry of Health/SVS - Disease Information System - SINAN NET

*Confirmed cases by Year of Diagnosis and Region of Notification; Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.3. ANÁPOLIS IS REGISTERED AS THE 3rd LARGEST REGION IN NUMBERS OF CONGENITAL SYPHILIS CASES IN BRAZIL

Among all the municipalities analyzed within the Midwest Region, the most notified was the region of Goiânia

(n = 693), followed by Rio Verde (n = 270) and, with emphasis, we have the region of Anápolis (n = 184), ranked as the third region with the most confirmed cases of congenital syphilis. Briefly, the complete data are presented in Table 3

Municipality of Notification	Midwest region	Total
TOTAL	1.503	1.503
Águas de Lindóia	2	2
Aloândia	1	1
Anápolis	184	184
Anicuns	1	1
Aparecida de Goiânia	77	77
Aragarças	1	1
Avelinópolis	1	1
Barro Alto	1	1
Bela Vista de Goiás	2	2
Bom Jesus de Goiás	5	5
Cachoeira Dourada	1	1
Caçu	2	2
Caiapônia	3	3
Caldas novas	1	1
Campinorte	1	1
Campos Belos	5	5
Catalão	11	11
Ceres	31	31
Chapadão do Céu	3	3
Cristalina	7	7
Divinópolis de Goiás	1	1
Faina	1	1
Firminópolis	1	1
Formosa	7	7

Municipality of Notification	Midwest region	Total
Goianésia	2	2
Goiânia	693	693
Goiatuba	2	2
Iporá	2	2
Itaberaí	2	2
Itajá	2	2
Itapaci	1	1
Itapuranga	2	2
Itumbiara	5	5
Jaraguá	1	1
Jataí	79	79
Luziânia	1	1
Mambai	1	1
Mineiros	1	1
Morrinhos	7	7
Niquelândia	1	1
Novas Crixás	2	2
Novo Gama	1	1
Orizona	1	1
Palmeiras de Goiás	1	1
Paraúna	1	1
Pirenópolis	3	3
Pires do Rio	2	2
Planaltina	1	1
Pontalina	1	1
Posse	5	5
Quirinópolis	1	1
Rio Verde	270	270
Santa Helena de Goiás	2	2
Municipality of Notification	Midwest region	Total
São Luís de Montes Belos	1	1
Senador Canedo	18	18
Trindade	29	29
Uruaçu	9	9
Vicentinópolis	3	3

Table 3. Confirmed cases of congenital syphilis by Region of Notification, according to Municipality of notification*
Source: Ministry of Health/SVS - Disease Information System - SINAN NET

*Confirmed cases by Year of Diagnosis and Region of Notification; Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.4. WHITE MOTHERS AND WITH INCOMPLETE HIGH SCHOOL ARE THE BIGGEST FACTORS ASSOCIATED WITH CONGENITAL SYPHILIS

Confirmed cases according to the mother's level of education are shown in Table 4.

In greater numbers (n = 295) there is Incomplete High

School, followed by incomplete 5th to 8th grades of Elementary School (n = 251) and, finally, complete High School (n = 206).

Mother's schooling	Midwest region	Total
Total	1.503	1.503
Ign/White	497	497
Illiterate	5	5
Incomplete 1 st to 4 th grade Elementary school	25	25
Complete 4 th grade Elementary school	32	32
Incomplete 5 th to 8 th grade Elementary school	251	251
Complete primary education	132	132
Incomplete High school	295	295
Complete High school	206	206
Incomplete higher education	22	22
Complete higher education	15	15
Not applicable	23	23

Table 4. Confirmed cases of congenital syphilis by Notification Region according to mother's educational level*

Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification;
 Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.5. AMONG ALL AGE GROUPS, 80 YEAR OLD AND OLDER MOTHERS PREVAIL IN GENERATION OF CONFIRMED CASES

The relationship of the mother's age group in confirmed cases of congenital syphilis is shown in Table 5.

The cases in which the mothers are eighty years old or older (n = 1,430) are discrepant from the White ratio (n = 73).

Mother Age Group	Midwest region	Total
Total	1.503	1.503
White	73	73
80 and +	1.430	1.430

Table 5. Confirmed cases of congenital syphilis by Notification Region by age group of the mother*

Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification;
 Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.6. PRENATALS ARE PERFORMED FOR CONFIRMED CASES OF CONGENITAL SYPHILIS

The classifications of mothers who underwent prenatal care (n = 1,174) were associated with confirmed cases of congenital syphilis by Table 6.

In a majority and discrepant way, mothers who had prenatal care (n = 1,174) were in greater numbers when compared to those who did not have prenatal care (n = 243).

Underwent Prenatal Care	Midwest	Total
Total	1.503	1.503
Ign/White	86	86
Yes	1.174	1.174
No	243	243

Table 6. Confirmed cases of congenital syphilis by Notification Region according to prenatal care*

Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification;
 Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.7. CHILDREN UP TO 6 DAYS OF AGE HAVE A HIGHER PREVALENCE OF CONGENITAL SYPHILIS

In Table 7, we have the confirmed cases in relation to the age group of the carrier. In these results, we highlight the age group of up to 6 days of age (n = 1,455), followed by 28 days to less than 1 year (n = 23) and, later, from 7 to 27 days (n = 20).

Age group	Midwest region	Total
Total	1.503	1.503
Up to 6 days	1.455	1.455
7-27 days	20	20
28 days to < 1 year	23	23
1 year (12 to 23 months)	5	5

Table 7. Confirmed cases by Notification region according to age group of carrier*

Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification;
 Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.8. PARTNERS DO NOT PERFORM TREATMENT

According to the results presented in Table 8, confirmed cases, according to the treatment of the mothers' partners, were reported, for the most part, with the non-treatment of the partner (n = 847), twice as much when compared to the positive partner treatment (n = 424).

Partner treatment	Midwest region	Total
Total	1.503	1.503
Ign/White	232	232
Yes	424	424
No	847	847

Table 8. Confirmed cases by Region of notification according to partner treatment*

Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification; Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.9. A LARGE PART OF CONGENITAL SYPHILIS CASES EVOLVE TO SURVIVAL

The evolution of cases of congenital syphilis is shown in Table 9. In discrepant numbers, we have the survival condition (n = 1,340) for confirmed cases of congenital syphilis and, in lower parameters, death by disease (n = 18) and death for other causes (n = 22).

Evolution	Midwest region	Total
Total	1.415	1.415
Ign/White	35	35
Alive	1.340	1.340
Death due to notified disease	18	18
Death from another cause	22	22

Table 9. Confirmed cases by Region of notification according to Evolution of cases with congenital syphilis*
 Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification;
 Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

3.10. RECENT CONGENITAL SYPHILIS HAS A HIGHER PREVALENCE WITHIN MORBIMORTALITY

The final classification of congenital syphilis is shown in Table 10. The classification as recent reached higher numbers (n = 1,415) and, with lower numbers, stillbirth/abortion due to syphilis (n = 23) and discarded (n = 65).

Final classification	Midwest region	Total
Total	1.503	1.503
Recent Congenital Syphilis	1.415	1.415
Stillbirth/Abortion due to Syphilis	23	23
Discarded	65	65

Table 10. Confirmed cases by Notification Region according to Final Classification*
 Source: Ministry of Health/SVS - Disease Information System - SINAN NET
 *Confirmed cases by Year of Diagnosis and Region of Notification;
 Notification region: Midwest region; Notification State: Goiás; Period: 2017-2021; Data from 2007 to 2021 updated on 06/30/2021, data subject to review; Data made available on TABNET in December / 2021.

DISCUSSION

The prevalence of congenital syphilis in the region of Anápolis-GO was high, as found in the results presented by our research, which point to Anápolis occupying the third place among all the cities evaluated in the Midwest Region. In this study, a total of 184 confirmed cases were identified in the municipality of Anápolis in the period from 2017 to 2021. In the study by Dias⁶, the region of Anápolis was identified with a total of 268 cases in the period from 2011 to 2016. Within this prevalence, they corresponded to a range of 54% general cases in mothers aged 20 to 29

years, 23% corresponded to incomplete secondary education, 38% were diagnosed in the 3rd trimester of pregnancy and, curiously, 65% prevailed in brown color people.⁶

In the results found by Bezerra et al.⁷, as a measure of congenital syphilis and child health conditions in Brazil, in the years evaluated (2010 to 2015), the number of confirmed cases in children under one year of age increased in a proportion from 6,944 to 19,228 cases in five years. However, in his assessment of the Midwest region, this, among all Brazilian regions, had the lowest numbers of confirmed cases (n = 4,089)⁷. Recently, and corroborating this study, Dos Santos et al.⁸, in a study on syphilis in Brazil, with a more epidemic perspective, showed an increasing progression of confirmed cases of syphilis during pregnancy (in greater proportions when compared to other types of syphilis), acquired syphilis and congenital syphilis, evidenced among the years from 2007 to 2020 and greater specifications between the years 2011 to 2017⁸. In this study, also for congenital syphilis, evaluated between the years 2007 to 2017, the Midwest region showed significant rates (AAPC = 19.06%) on average percentage of annual changes.

The prevalence of congenital syphilis in Brazil, when compared to other countries such as Mexico, according to the study by García-Cisneros et al.⁹, is in increasing progress, also corroborating the studies mentioned above. However, with a somewhat straight growth for evident increasing progress, from the year 2017 to 2019. In disagreement with our results (Figure 1), which show a concave curve for the distribution of cases of congenital syphilis, the cases presented by the study by García-Cisneros et al.⁹, show a convex distribution (2010-2019)⁹.

According to our results, factors that influence mothers' conditions, such as education classification, were prevalent for Incomplete High School (n = 295), eighty years or more (n = 1,430) and prenatal care (n = 1,174). Regarding the carrier's conditions, a prevalence of up to six days was identified in relation to age (n = 1,455). The acquisition of congenital syphilis was also attributed to the condition of the partner, where non-treatment was identified (n = 847). In addition, in relation to the carrier's conditions, it was observed that most children with congenital syphilis progress to survival (n = 1,340), and this pathology is, in most cases, classified as recent congenital syphilis (n = 1,415).

Services with prenatal care of quality can positively influence the outcomes of pregnancies. The significant increase found in different studies and also with a peak evidenced in our study (Figure 1), can be attributed to improvements in case notifications over the years, as well as advances in epidemiological surveillance in different ways around the world. In this context, we can highlight the implementation of the Project: No Syphilis!¹⁰ and, in their estimates, congenital syphilis has a higher transmission ranking. The Midwest region, however, has lower reported cases when compared to other Brazilian regions.

In this epidemiological study, we can see that there was

increasing progression, followed by decreasing progression in recent years (2021), in the Brazilian Midwest region. Corroborating with several studies, it is worth emphasizing, mainly, that there is a progress in the notifications of congenital syphilis in different periods surveyed, over the years, in the regions studied. The region of Anápolis, despite occupying a prominent place in cases of notification, according to the database consulted, has few studies. As a result, further studies are needed to emphasize the importance of research and health centers aimed at acquiring notification data on confirmed cases of congenital syphilis and other types of syphilis in the region of Anápolis. This study, therefore, achieves an innovative objective in the discovery of recent parameters on the Midwest region, attributing characteristics to the Anápolis region for the present times.

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ACKNOWLEDGEMENTS

To my son Gabriel, my husband Edson, my parents and brothers, who encouraged me in difficult times and understood my absence while I dedicated myself to carrying out this work.

To my colleagues and preceptors of the Medical Residency, in particular, to Dr. Izaura, for being my advisor and having performed this role with dedication and friendship.

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