

EPIDEMIOLOGICAL PROFILE OF CONGENITAL SYPHILIS BETWEEN THE STATE OF RONDÔNIA AND A NORTH REGION

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Abstract: Congenital syphilis is a transmissible infection with a high prevalence among Brazilian states. Among its forms, the congenital one stands out, this one acquired by the fetus in the period pregnancy, which has been linked to public health and social factors. Therefore, the objective is to analyze and describe epidemiological variables of congenital syphilis in the state of Rondônia and the North region of Brazil. This is a cross-sectional, observational and retrospective study. Epidemiological data of cases of congenital syphilis in the state of Rondônia and the northern region of Brazil between 2010 and 2019 were used, extracted from the Secretariat of Health Surveillance database of the Ministry of Health, from which syphilis prevalence data were summarized. congenital and deaths from the disease and secondary data related to the child's age, final diagnosis, age, race and mother's education, prenatal care; time of diagnosis and maternal treatment regimen.

Data were tabulated and analyzed with the -T Test for independent samples considering $p \leq 0.05$ as significant. The general panorama of the disease in Rondônia is similar to that found in the northern region. There was a significant increase in the number of cases ($p \leq 0.01$) and deaths due to congenital syphilis ($p \leq 0.01$) and secondary data, with emphasis on data related to education, early diagnosis and adequate treatment.

Such results point to hypotheses such as problems in public health and improvement in reporting, which are rooted in social problems such as the level of education, education sexual orientation, reflecting lower adherence to treatments, attendance at prenatal care and quality of care.

Keywords: Congenital Syphilis; Health Profile; Disease Notification.

INTRODUCTION

Syphilis is a transmissible infection caused by the bacterium *Treponema pallidum*, a bacterium classified as gram-negative in the spirochete group (PEELING et al., 2018). This disease is subdivided, according to its form of transmission, into acquired, when transmitted by sexual routes or through contact with contaminated materials, and into congenital, when acquired by the fetus during the gestational period (WOODS, 2005).

Although more than 60% of infected children are asymptomatic at birth, with the appearance of the first symptoms, usually in the first 4 months of life, this disease presents complications, in its recent form, such as prematurity, low birth weight, hepatomegaly and musculoskeletal lesions with characteristic radiological images, in the late form, it presents tibia in "Saber's Blade", Clutton's joints, "Olympic" forehead, saddle nose, Hutchinson's triad and learning difficulties (MINISTRY OF HEALTH, 2020).

Congenital syphilis has revealed deeper public health scenarios than just the high number of infections. Epidemiological studies carried out in different regions and states of Brazil demonstrate that in addition to the growth of cases of congenital syphilis, population characteristics such as the age range of adolescent mothers and low education level further aggravate the studied problem, leading to the belief that the rise in infections possibly has its origin in factors that are socio-environmental (CAVALCANTE; PEREIRA; CASTRO, 2017; TORRES et al., 2019).

Some situations involving care for pregnant women are described, that is, there are low rates of care and adherence to prenatal care, a high rate of inadequate treatment or even non-completion of treatment. Inadequate treatment is considered when the therapy in the pregnant woman is performed with medication other than penicillin, incomplete

treatment or not adequate for the clinical phase or the institution of treatment less than 30 days before delivery. The inclusion of the partner is no longer in the parameters since 2017 (DOMINGUES et al, 2021). This scenario reveals difficulties regarding health care (COOPER et al., 2016; TAYRA et al., 2007). And as a result of these factors, even more negative outcomes have been observed, such as high infant deaths and high rates of stillbirths and abortions due to the infection (HOLANDA et al., 2011; SARACENI, Valeria et al., 2017)

Since congenital syphilis is considered a public health problem, it is an indicator of the quality of health care. That is, adherence to prenatal care, adequate treatment, reduction in the number of deaths, as well as encouraging family education programs and strategies, sexual education and preventive resources for sexually transmitted diseases become virtues that leverage the quality of health care, and in the long term reduce the quantity of cases of the disease (ARAÚJO et al., 2012; REZENDE; BARBOSA, 2015).

There are several studies that demonstrate the scenario of congenital syphilis in different regions of Brazil, but each region has particularities that may or may not influence the rates of each influential factor of the disease. That is, states in the northern region of the country, such as Rondônia, still have regions of precarious accessibility, which may hinder the arrival of assistance resources and still present populations still exposed to the context of inaccessibility to information and education, all of which may contribute to the indices involving congenital syphilis. Therefore, the present study aims to analyze and describe epidemiological variables of congenital syphilis in the state of Rondônia and northern Brazil.

METHODOLOGY

This manuscript is a cross-sectional, observational and retrospective study. Epidemiological data of cases of congenital syphilis in the state of Rondônia and the northern region of Brazil between 2010 and 2019 were used, and all data were collected from the Health Surveillance Secretariat (SVS) of the Ministry of Health (MS). It is also noteworthy that the development of the study complied with the ethical terms provided for in resolution 466/12 of the National Health Council.

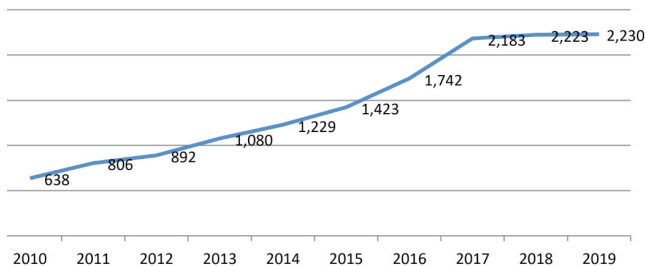
The extracted and analyzed data were: number of cases of congenital syphilis in children under one year old; deaths from congenital syphilis in children under one year old; child's age, with age stratifications ranging from: less than 7 days, 28 to 364 days, 1 year, 2 to 4 years and 5 to 12 years; final diagnosis, being: recent congenital syphilis, late congenital syphilis, abortion due to syphilis and stillbirth due to syphilis; mother's age group, with age stratifications between: 10 to 14 years, 15 to 19 years, 20 to 29 years, 30 to 39 years and 40 years or more; mother's schooling, being: illiterate, incomplete 1st to 4th grade, complete 4th grade, incomplete 5th to 8th grade, complete elementary school, incomplete secondary, complete secondary, incomplete higher education, complete higher education; mother's race; carrying out prenatal care; time of diagnosis of maternal syphilis, being: during prenatal care, at the time of delivery/curettage, after delivery and not performed; and maternal treatment scheme, being: adequate; inappropriate and not accomplished.

The summarization and arrangement of data were performed in tables in Microsoft Excel® 2019 software. The presentation of key data, number of cases and deaths, was performed using graphs, observing the progression based on annual numbers. The presentation

and analysis of all the studied variables was carried out in tables, and the effect measures through the analysis of significance and mean and standard deviation with the statistical test –T of independent samples with the statistical analysis software IBM SPSS – 20, considering the increase prospective of the samples. Finally, interpretation of data significance considered p value ≤ 0.05 and the results were analyzed and discussed with related references.

RESULTS

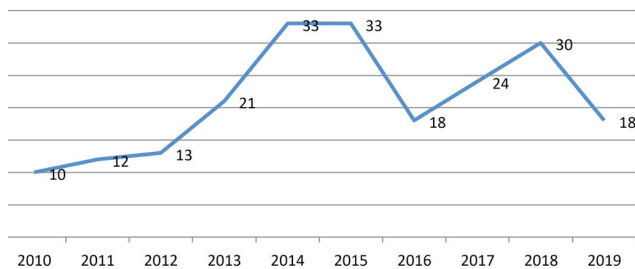
The results are data are extracted from the Secretariat of Health Surveillance (SVS) of the Ministry of health (MS) in between 2010 to 2019.



Graphic 1 - Syphilis congenital in under one year (cases).

Caption: Progression in the number of cases of congenital syphilis in the northern region of Brazil between 2010 and 2019. Source: MS/ SVS/ Department about Illnesses; infections that can be sexually communicable

Graph 1 demonstrates the prospective scenario of the increase in syphilis cases congenital in children under one year old between 2010 and 2019 in the North region of Brazil, from ascending pattern with a trend towards stabilization in the last three years. It's possible to observe an upward trend with an average progression rate of 15% per year.



Graph 2 - Deaths by syphilis congenital in minors in one year.

Caption: Progression in the number of deaths due to congenital syphilis in the northern region of Brazil between 2010 and 2019.

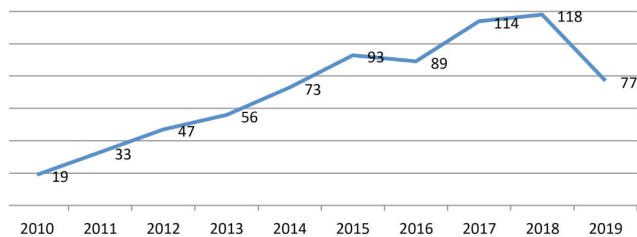
Source: MS/SVS/ Department about Illnesses; infections that can be sexually communicable

Graph 2 shows the prospective scenario of the increase in deaths from syphilis congenital in children under one year old between 2010 and 2019 in the North region of Brazil, such graph has a bimodal pattern with peaks of cases in 2014/2015 and 2018. possible observe one trend in increase with one rate in progression average of 7% year to year.

Table 1 (appendices) presents the summarized data that were extracted from the Department of Diseases, Chronic Conditions and Sexually Infected from the Ministry of Health corresponding to the North region of Brazil demonstrate a significant increase both in the number of cases of congenital syphilis how much of deaths in babies under 1 year old (p 0.01) (graphs 1 and 2). regarding to the number of infected individuals by age, the data show that in all age groups, there was a significant increase in cases of infection (p 0.01). But for the final diagnosis from the illness, there was a significant increase for all the diagnoses, recent congenital syphilis (p 0.01), late (p 0.01), abortion due to syphilis (p 0.01) It is stillborn per syphilis (P 0.01). The diagnosis also increased significantly between all times, namely: during prenatal care (p 0.01), at time of delivery/curettage (p 0.01), after delivery (p 0.01), and diagnoses not

performed (P 0.01).

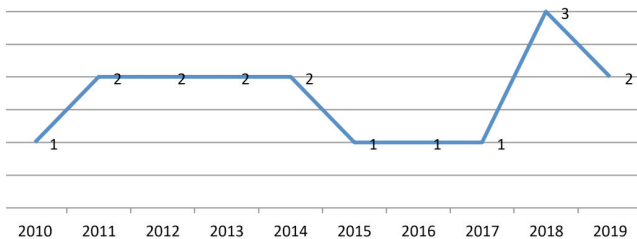
Regarding the maternal data, there was increase significant in cases from mothers of all age groups (p 0.01), all education levels (p 0.01) and of all races and colors (p 0.01).



Graph 3 - Syphilis congenital in under one year (cases).

Caption: progression of the number of cases of congenital syphilis in Rondônia between 2010 and 2019. Source: MS/SVS/ Department about Illnesses; infections that can be sexually communicable

Graph 3 demonstrates the prospective scenario of the increase in syphilis cases congenital in children under one year old between 2010 and 2019 in the state of Rondônia, with one standard rising until 2015, it is after until 2018, with one decrease more accentuated in 2019. It is possible to observe an upward trend with a rate in progression average of 17% year to year.



Graph 4 - Deaths by syphilis congenital in minors in one year.

Caption: Progression in the number of deaths from congenital syphilis in Rondônia between 2010 and 2019. Source: MS/SVS/Department about Illnesses; infections that can be sexually communicable.

Graph 4 shows the prospective scenario of the increase in deaths from syphilis congenital in children under one year old between 2010 and 2019 in the state of Rondônia. It is possible to observe one trend in increase with one rate in progression average of less than 1%, not being a significant increase due to the difference in populational number.

Table 2 (appendices) presents the summarized data that were extracted from the Department of Diseases, Chronic Conditions and Sexually Infected from the Ministry of Health corresponding to the state of Rondônia that demonstrate a significant increase both in the number of cases of congenital syphilis how many deaths in babies under 1 year (P 0.01) (graphic 3 and 4).

With relationship to the number in individuals infected per age, the data demonstrate what there was one increase significant of the cases in infection in between children aged less than 7 days (p 0.01) and between 7 and 27 days (p 0.02). For kids between 28 and 364 days (p. 0.08), 1 year (p 0.34), 2 to 4 years (p 0.34) and 5 to 12 years (p 0.34) or increase it was not significant.

As for the final diagnosis of the disease, there was a significant increase only for the diagnosis in syphilis congenital recent (P 0.01). There was an increase significant for the diagnosis in syphilis congenital late (P 0.19), abortion per syphilis (P 0.34) the stillborn per syphilis (P 0.17). The diagnosis also increased significantly between all moments, namely: during prenatal care (p 0.01), at time of delivery/curettage (p 0.01), after delivery (p 0.01), and diagnoses not performed (P 0.03).

Regarding to the data maternal, there was increase significant in cases from mothers of all age groups (p 0.01), all levels of education (p 0.01), except for the group of illiterate mothers (p 0.19), and of all races and colors (p 0.01), except for yellow and indigenous women (p 0.34). Maternal treatment of syphilis

grew significantly (p 0.01) while inadequate treatment and not realization of treatment too have grown significantly (p 0.01).

DISCUSSION

Data obtained from MS SVS reveal a significant increase in the number of cases of congenital syphilis in children under 1 year of age, as well as a significant increase in the number of deaths associated with the disease between 2010 and 2019, so much in Rondônia (RO) how much at region north of country (N). In a first identification of this increase reveals a social scenario where education in sexual health is still precarious, that is, Costa *et al.*, (2013) point out that the development in measurements preventive in health public, as education, Early diagnosis and adequate treatment are crucial for controlling cases of infection and deaths from congenital syphilis, and consequently, the non-implementation of these measures may have repercussions on the vertiginous increase in cases (COOPER; SANCHEZ, 2018).

A failure from the notification of the cases in syphilis congenital at the sector in epidemiology it was one serious problem at the national level that prevented knowing the real situation of the population risk (LAFETÁ *et al.*, 2016), and turning our eyes to the scenario of the northern region and Rondônia, the identification of cases goes through specific complicating factors and characteristics of the Legal Amazon, such as regions of difficult access, communities riverside It is indigenous (GARNELO; SOUSA; SILVA, 2017; TIAGO *et al.*, 2017).

However, improving the capacity building of public resources and strategies for monitoring contributes for the improvement from the notification of the cases in syphilis, doing making it possible to recognize with greater propriety the real health scenario public service in a given region (COSTA *et al.* 2013).

Even though the improvement of notification of the disease leads to an increase in cases of infection, on the one hand this outcome makes the target population a priority in public health agendas, With the increase in demand from the population at risk, there is also an increase in attention directed to this public, researches with the objective of understanding the factors aggravating and mitigating factors of the disease and especially the establishment of measures interventions for, in the first instance, prevention, and in the second instance, treatment (RAC; STAFFORD; EPPES, 2020; ROWE; NEWBERRY; JNAH, 2018).

Returning to the characterization of the influencing factors of preventive measures public health, such as education, early diagnosis and adequate treatment. In this study, it is also possible to observe these associations. Both in the region north and in Rondônia there was a significant increase in maternal treatment adequate, inappropriate It is treatment no accomplished, however observing The descriptive frequency, it is observed that the means of inadequate maternal treatment (N: 911.5; RO: 42.5) It is no accomplished (N: 299.2; RO: 20.7) they are superiors to the adequate treatment (N: 97.2; OR: 5). In addition, prenatal care (N: p 0.01 (1154.50); RO: p 0.01 (57)) also increased, being even greater than the non-realization (N: p 0.01 (256.9) RO: p 0.01 (13.1)).

Studies from other regions also observe a situation of a number growing care, yet a large number of inadequate treatment (COAST *et al.*, 2013; PADOVANI; OLIVEIRA, R. R. IN; HAIRY, 2018; PINK *et al.*, 2020), showing that this is a national reality. Madeira *et al.*, (2013) point out that the inadequacy of the treatments originates from the low adherence of the pregnant women to treatment, which in turn has its origin in the low education of pregnant women regarding the need for continued

treatment and the importance of diagnosis precocious (REGINA; PAUL; TALITA, 2007). It is analysis allows presume that even with increased treatment for syphilis, it is likely in response to the increase in cases, treatment is not adequate in most cases.

When reflecting on the influencing factors of high treatment averages inadequate or no treatment of gestational syphilis, it is possible to observe factors as range age It is degree in schooling they can to be influencers precedents of knowledge insufficient about the need of diagnosis.

Both in Rondônia and in the northern region of Brazil, the gestation among mothers aged 10 to 14 and 15 to 19 years grew, with averages that raise concerns about the sexual education of young people and adolescents who, in theory, they would have a smaller educational base on the subject (SILVA *et al.*, 2021). As for education, it is possible to highlight higher averages of mothers with degrees of schooling between illiterate and incomplete secondary education, and this situation presents common in the setting of syphilis, with studies indicating between 31.7% and 60.5% in mothers with low schooling (BENITO; SOUZA, 2016; LIME

et al., 2019). Consequently, the sum of these factors, range age and level of education, reflect subsequently in insufficient instructions how much the methods contraceptives, use in condoms, follow-up prenatal, and assiduity to the treatment.

CONCLUSION

The general panorama from the syphilis congenital in Rondônia It is similar to the found in the northern region of Brazil, as well as in other regions of the country. And with it is possible to observe that the increase, both in cases and deaths, is linked to social problems that include level of education, sexual education, age is what subsequently reflects at smaller accession to the treatments, awareness about protection, prenatal attendance and quality of care. This way, it is possible to perceive that these are the main problems to be resolved, which from the data presented in the present study, can be solved from the creation and implementation of public health policies aimed primarily at preventing disease and improving adequacy in treatments, seeking out so to resolution of the problems so much the short as in long term.

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APPENDICES

Monitoring in syphilis congenital	p. (≤ 0.05)	Average	Detour Standard
Child's Age - Any less from 7 days	0.01	1394.60	597.012
Age of child - 7 to 27 days	0.01	28.30	10,188
Age of child - 28 to 364 days	0.01	21.70	10.328
Child's Age - 1 year	0.01	2.50	1958
Child's Age - 2 to 4 years	0.01	2.80	1,398
Child's Age - 5 to 12 years	0,01	1,00	,943
Final Diagnosis - Congenital Syphilis recent	0.01	1379,50	577,559
Diagnosis Final - Syphilis congenital late	0.01	3,90	1,729
Diagnosis Final - Abortion by syphilis	0.01	30.70	19,380
Final Diagnosis - Stillbirth bysyphilis	0.01	36.80	21,908
Range age from the Mother - 10 The 14 years	0.01	21.80	9,390
Range age from the Mother - 15 The 19 years	0.01	399.60	184,551
Range age from the Mother - 20 The 29 years	0.01	763.40	322,289
Range age from the Mother - 30 The 39 years	0.01	225.40	91,621
Mother's Age Range - 40 years old or more	0.01	20.90	9,422
Schooling of Mother - Illiterate	0.01	14.60	3.026
Mother's Education - 1st to 4th grade incomplete	0,01	106,50	11,844
Mother's Education - 4th grade complete	0,01	63,10	15,538
Mother's Education - 5th to 8th grade incomplete	0,01	399,70	157,058
Mother's Education - Elementary Complete	0,01	139,30	77,431
Schooling of Mother - Average	0,01	203,60	113,972
Mother's Education - Medium Complete	0,01	210,70	120,662
Mother's Education - Higher Incomplete	0,01	15,20	8,025
Mother's Education - Higher complete	0,01	12,40	6,433
Race or Color of Mother -	0,01	89,10	21,641
White Race or Color Mother's -	0,01	52,40	10,956
Black Race or Color of Mother-	0,01	4,80	2,044
Yellow Race or Color from Mother-	0,01	1245,90	568,119
brown Race or mother's color -	0,01	12,30	4,923
Indigenous	0,01	1154,50	471,775
Prenatal care - Yes	0,01	256,90	136,441
Realization in prenatal- No	0,01	619,90	298,347
Time of diagnosis of syphilis maternal - During prenatal care Time of diagnosis of syphilis maternal - at the time of delivery/curettage	0,01	547,60	252,666
Time of diagnosis of syphilis maternal - After the birth	0,01	212,60	39,303
Time of diagnosis of syphilis maternal - No accomplished	0,01	15,00	9,165
Maternal treatment schedule - Adequate	0,01	97,20	31,460
Maternal treatment scheme - Inappropriate	0,01	911,50	406,474
Maternal treatment scheme - not accomplished	0,01	299,20	119,235

Table 1 - Data in monitoring in syphilis congenital from the region north of Brazil

Subtitle: monitoring from the syphilis congenital from the region north of Brazil in between 2010 It is 2019.

Source: MS/SVS/Department in Illnesses in Conditions Chronicles It is infections sexually transmissible

Monitoring of congenital syphilis	p. (≤ 0.05)	Average	Standard deviation
Child's Age- Less than 7 days	0,01	69,60	31,81
Child's Age- 7 to 27 days	0,02	1,20	1,398
Child's Age -28 to 364 days	0,08	1,10	1,729
Child's Age- 1 year	0,34	0,10	,316
Child Age- 2 to 4 years old	0,34	0,10	,316
Child Age-5 to 12 years	0,34	0,20	,632
Final Diagnosis - Congenital Syphilis	0,01	71,60	32,644
Recent			
Final Diagnosis - Late congenital syphilis	0,19	0,30	,675
Diagnosis Final - abortion by syphilis	0,34	0,20	,632
Diagnosis Final - Stillbirth per syphilis	0,16	0,20	,422
Mother's Age Range - 10 14 years old	0,01	1,50	1,509
Mother's Age Range - 15 19 years old	0,01	16,80	7,421
Mother's Age Range - 20 29 years old	0,01	39,00	21,019
Mother's Age Range - 30 39 years old	0,01	12,90	7,415
Mother's Age Range - 40 years or more	0,01	1,50	1,434
Mother's Education - Illiterate	0,19	,30	,675
Mother's Education - 1st the 4th series incomplete	0,01	6,30	3,653
Mother's Education - 4th complete series	0,01	3,80	2,044
Mother's Education - 5th the 8th series incomplete	0,01	20,90	8,950
Mother's Education - Elementary Complete	0,01	4,80	2,658
Mother's Education - Medium Incomplete	0,01	9,60	6,802
Mother's Education - High School Complete	0,01	10,10	5,896
Mother's Education - Incomplete higher	0,03	1,00	1,247
Mother's Education - Graduated	0,01	0,80	,789
Mother's Race or Color - White	0,01	7,90	4,795
Mother's Race or Color - black	0,01	3,50	2,273
Race or Color of Mother- Yellow	0,34	0,10	,316
Race or Color of Mother- brown	0,01	56,10	29,437
Race or Color of Mother - Indigenous	0,34	0,10	,316
Carrying out pre- Christmas- Yes	0,01	57,00	26,725
Carrying out pre- Christmas- No	0,01	13,10	8,386
moment of diagnosis of syphilis maternal - During the prenatal	0,01	36,50	18,314
moment of diagnosis from the syphilis maternal - at the moment childbirth/curettage	0,01	25,70	14,637
moment of diagnosis of syphilis maternal - After O childbirth	0,01	7,20	5,181
moment of diagnosis of syphilis maternal - No accomplished	0,03	1,00	1,247
scheme of maternal treatment - Adequate	0,01	5,00	4,243
scheme of maternal treatment - Inappropriate	0,01	42,50	22,668
scheme of maternal treatment - not accomplished	0,01	20,70	12,184
deaths from syphilis congenital in minors in one year - Cases	0,01	1,70	,675

Table 2 - Data in monitoring in syphilis congenital of state in Rondônia, between 2010 and 2019.

Caption: monitoring of congenital syphilis in the state of Rondônia between 2010 and 2019. Source: MS/SVS/Department in Illnesses in Conditions Chronicles It is infections sexually transmissible