

ORIGINAL ARTICLE

Congenital syphilis: epidemiological analysis and sentinel event of the quality of care for the mother/newborn binomium

Mara Rejane Barroso Barcelos^a, Eliane de Fátima Almeida Lima^b, Arlete Frank Dutra^c, Tatiane Comerio^c, Cândida Caniçali Primo^b

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^aDepartamento de Ginecologia e Obstetrícia
Universidade Federal do Espírito Santo. Av. Mal. Campos, 1468 - Maruípe, Vitória - ES, 29047-105

^bDepartamento de Enfermagem, Universidade Federal do Espírito Santo. Av. Mal. Campos, 1468 - Maruípe, Vitória - ES, 29047-105

^cGerência de Vigilância em Saúde, Secretaria Municipal de Saúde de Vitória.

Corresponding author

mararsb@gmail.com

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Abstract

Introduction: congenital syphilis remains a serious public health problem in Brazil and worldwide, being fetal and antenatal infections the main causes of global morbidity and mortality.

Objective: to analyze the cases of congenital syphilis and an outcome indicator of the quality of care for the mother/newborn binomial in Vitória (ES), in the 2016-2019 quadrennium.

Methods: study with a quantitative approach, which evaluated the indicator "congenital syphilis follow-up". Data were collected in the Notifiable Diseases Information System (SINAN), for the period from January 1, 2016 to December 31, 2019. The information regarding the follow-up of NB occurred by searching an electronic medical record, from August 1, 2020 to March 31, 2021.

Results: in the 2016-2019 quadrennium, the municipality of Vitória had 169 cases of congenital syphilis, according to the year of diagnosis criterion. This indicator decreased over the quadrennium: 64 cases in 2016 (37.9%), 43 in 2017 (25.4%), 37 in 2018 (21.9%) and 25 in 2019 (14.8 %). The nontreponemal test was reactive in 62.7% of cases. In 10.7% there were alterations in the laboratory analysis of the CSF; 3%, alteration in the examination of long bones; 5.3%, non-treponemal CSF reagent test, and 11.8% were symptomatic at birth. The congenital syphilis incidence rate, which was 14.65/1000 live births in 2016, reached 5.58/1000 live births in 2019. The follow-up indicator for congenital syphilis cases that were born alive was 69.8 % in 2016, 79.5% in 2017, 84.4% in 2018 and 85.7% in 2019.

Conclusion: there was a significant reduction in the number of cases of congenital syphilis, in the incidence rate of the disease and progressive improvement in the follow-up of congenital syphilis, having, as a guideline, the Plan to Eliminate Syphilis.

Keywords: congenital syphilis, vertical transmission of infectious disease, epidemiological monitoring, health assessment.

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Authors summary

Why was this study done?

This study focused on analyzing cases of congenital syphilis in the municipal area of Vitória, Espírito Santo State, one of the capital cities in the southeast Brazil, in the quadrennium of 2016-2019. In 2016, the Plan to Eliminate Syphilis was reformulated so as to improvingly tackle the disease. It was conducted an epidemiological study of cases and the assessment of a quality indicator of the assistance to the mother/newborn binomial in Vitória (ES), in the quadrennium of 2016-2019. Syphilis is a millennium illness that became a public health problem in Brazil and worldwide. Recent findings about the elimination of the disease are integral to the fields of management, assistance, education, and research. Thus, the authors aimed at learning the epidemiological profile of syphilis cases in pregnant women and a result indicator of quality in the assistance to the mother/newborn binomial in Vitória (ES), in the quadrennium 2016-2019.

What did the researchers do and find?

It is an original study, which concluded that there was a significant reduction in the number of cases of congenital syphilis and in the incidence rate of this disease in the city of Vitória, with advances in the follow-up indicator of the congenital syphilis since the implementation of diverse actions to eliminate the disease. Nevertheless, no treatment, inadequate treatment of the pregnant woman those that sought for prenatal care, and the reinfection, were the main factors that influenced the occurrence of CS.

What do these findings mean?

Despite the improvements observed during the quadrennium, the results reveal the need for advance in the quality of prenatal care.

INTRODUCTION

Syphilis is one of the most frequent sexually transmitted infections (IST) in the world and it is responsible for 6 million new cases each year, being the congenital syphilis the second main cause of preventable death¹. The vertical transmission is, more frequently, intrauterine or in the presence of an active injury, in the passage of the fetus through the birth canal. So, it can be antenatal, perinatal or postnatal. Antenatal fetus infections are the main causes of morbidity and global mortality².

The probability to occur congenital syphilis (CS) is influenced by the stage of syphilis in the mother and by the duration of fetus exposure, being around 70% to 100% when the pregnant woman has primary or secondary syphilis³. Brazil has a prevalence of 0.85% of syphilis⁴. In 2015, the country did not reach the goal to reduce the incidence of CS to ≤ 0.5 cases per 1,000 live births⁵.

In 2016, syphilis was declared a major public health problem by the Brazilian Ministry of Health, being the elimination of its vertical transmission provided as prior in the Pluriannual Plan (PPA). The elimination of syphilis is part of the main management instruments of States, the Federal District and municipal areas⁶.

The municipality is the main place to implement health policies, with the decentralization of the Brazilian Health Care System (SUS)⁷.

The city of Vitória, in Espírito Santo State, has developed a program instrumentalized by "Vitória's Plan to Eliminate Syphilis", in 2016, aiming at monitoring and evaluating the elimination of the disease⁸.

This plan is compound by eight axes: early uptake of the pregnant woman with syphilis; prenatal care for all pregnant women; offer of adequate treatment against syphilis; monitoring of the cases in the general public; monitoring the pregnant women with syphilis and their partners; monitoring of the plan; realization of preventive actions against syphilis (to the general public and pregnant women); and follow-up of congenital syphilis⁸.

The city's Plan to Eliminate Syphilis undergoes regular evaluation with the tracking of indicators⁸. The elaboration and use of result indicators in the evaluation of programs have been seized in the field of health planning and evaluation⁹. The quantitative focus helps to reveal

the general aspects of the assessed events¹⁰ and shows the partial results of the assessment questions¹¹.

It is considered that indicators are variables that provide the best possible image of an object, and the selection of these indicators is a critical task of the assessor^{9,12}.

Seeking for national, regional and local estimates helps to orient the strengths of the health systems to improve the disease prevention, detection, surveillance and treatment¹. By analyzing the data in the notification records within a period, it is possible to ascertain the problem and reflect about the public health policies adopted, which aim at implementing better attention to the prenatal care and to the prevention of the vertical transmission of syphilis (VT)¹³.

To select the scientific literature, it was used the relevance, accessibility, and topicality criteria.

This study aimed at analyzing the cases of congenital syphilis and a quality indicator of the assistance to mother/newborn binomial in Vitória (ES), in the quadrennium of 2016-2019.

METHODS

This is a study with a quantitative approach, which evaluated the indicator "congenital syphilis follow-up". Data were collected in the Notifiable Diseases Information System (SINAN), for the period from January 1st, 2016 to December 31st, 2019. And the information regarding the follow-up of newborn babies with CS occurred through a search in the electronic medical record, in the period from August 1st, 2020 to March 31st, 2021¹⁴.

The notifications were reviewed according to the defining criteria of CS cases of the Brazilian Ministry of Health (MS), in force for the period of 2016 to 2019^{3,15-16}.

The variables studied were distributed according to the mother's sociodemographic characteristics namely: age group; schooling; realization or not of prenatal care; municipality of realization of the prenatal care; time of diagnosis of maternal syphilis; results of the nontreponemal test (NTT) of the pregnant woman; treponemal test of pregnant women at childbirth/curettage; mothers' treatment schedule; mother's partner treatment; municipality of birth/abortion/stillbirth; places of birth/abortion/stillbirth.

The sociodemographic (sex, age, race/color), clinical and laboratory characteristics of the children were also analyzed (treponemal test, nontreponemal test, laboratory analysis of cerebrospinal fluid, X-ray of long bones, clinical diagnosis, signs and symptoms presented and evolution of the cases). Categorical variables were expressed as absolute and relative frequencies.

From 2016 to October 12th, 2017, the appropriate treatment was that one realized only with penicillin, accomplished at the appropriate dose and time, according to the clinical stage of the disease, with treatment completion within 30 days before childbirth¹⁵.

Since October 13th, 2017, the Informative Note No. 2-SEI/, 2017 established a modification in the treatment adequation criteria and included the use of benzathine penicillin as therapeutic regimen consonant to the clinical stage of the disease, with the beginning of the treatment up to 30 days before childbirth, and respecting the recommended interlude from 7 to maximum 14 days between doses¹⁶.

Furthermore, the incidence rate of congenital syphilis for every thousand live births was calculated, dividing the number of cases with congenital syphilis in a given year by the number of live births in the same year, and multiplying it by 1000.

The analysis of SINAN data was realized using the PSPP statistical package, from January to May 2020.

This research was submitted to the Research Ethics Committee of the Health Sciences Center, of the Federal University of Espírito Santo State, and approved by the Report No. 3,787,294, of December 20th, 2019, CAAE 25982319.6.0000.5060.

RESULTS

Characterization of reported cases of mothers' congenital syphilis in the 2016-2019 quadrennium

The surveyed mothers were predominantly from the age group of 20 to 29 years old (44.5%); and the other groups were as follows: 10 to 19 years old (24.9%), 30 to 39 years old (21.9%) and 40 to 49 years old (3.0%). The predominant race/color was brown (74.6%). Of the total number of mothers, 17.2% had incomplete primary education; 10.1% completed secondary school; 9.5% completed primary school; 7.7% had incomplete secondary education, characterizing the predominance of low education (Table 1).

Amongst the mothers, 72.2% underwent prenatal care. As for the municipality where it took place, 91.8% took place in Vitoria (ES) (not in the table).

The maternal syphilis diagnosis was verified in 54.4% of women during prenatal care, and in 34.9%, at the time of childbirth/curettage. Regarding the result of the nontreponemal test of the pregnant woman during childbirth/curettage, it was positive in 89.9% (Table 1). Regarding their outcomes, 63.2% had a test result less or equal to 1/8, and 36.8%, higher than 1/8 (not listed).

Considering the pregnant woman's treponemal test at childbirth/curettage, 57.4% had a reactive result. The mothers' treatment regimen was considered adequate in only 4.7% (Table 1).

Regarding the partners, 71.0% were not treated concomitantly with the pregnant women (Table 1).

Regarding the city of childbirth/abortion/stillbirth, 91.1% occurred in Vitoria (ES) (not listed).

Table 1: Mother's sociodemographic and clinical-laboratorial data - congenital syphilis database of residents in Vitoria - 2016 to 2019.

Variables	Year of diagnosis									
	2016		2017		2018		2019		Total	
	n	%	n	%	n	%	n	%	n	%
Mother's Age										
10 to 19 yo	22	34.4	6	14.0	6	16.2	8	32.0	42	24.9
20 to 29 yo	32	50.0	16	37.2	18	48.6	9	36.0	75	44.4
30 to 39 yo	7	10.9	11	25.6	11	29.7	8	32.0	37	21.9
40 to 49 yo	3	4.7	-	-	2	5.4	-	-	5	3.0
Unknown	-	-	10	23.3	-	-	-	-	10	5.9
Mother's Race/color										
White	3	4.7	2	4.7	3	8.1	1	4.0	9	5.3
Black	5	7.8	3	7.0	5	13.5	2	8.0	15	8.9
Brown	45	70.3	34	79.1	27	73.0	20	80.0	126	74.6
Ignorado	11	17.2	4	9.3	2	5.4	2	8.0	19	11.2
Mother's Schooling										
Illiterate	-	-	-	-	1	2.7	-	-	1	0.6
Primary School 1st. to 4th. incomplete grades	3	4.7	1	2.3	-	-	-	-	4	2.4
Complete 4th. grade	1	1.6	-	-	-	-	-	-	1	0.6
Incomplete 5th. to 8th. grades	13	20.3	5	11.6	8	21.6	3	12.0	29	17.2

Continuation - Table 1: Mother's sociodemographic and clinical-laboratorial data - congenital syphilis database of residents in Vitoria - 2016 to 2019.

Variables	Year of diagnosis									
	2016		2017		2018		2019		Total	
	n	%	n	%	n	%	n	%	n	%
Complete Primary School	6	9.4	5	11.6	3	8.1	2	8.0	16	9.5
Incomplete Secondary School	3	4.7	7	16.3	2	5.4	1	4.0	13	7.7
Complete Secondary School	3	4.7	9	20.9	2	5.4	3	12.0	17	10.1
Incomplete college education	2	3.1	-	-	-	-	-	-	2	1.2
Unknown	32	50.0	15	34.9	21	56.8	16	64.0	84	49.7
Not Applicable	1	1.6	1	2.3	-	-	-	-	2	1.2
Maternal Syphilis Diagnosis										
During prenatal	38	59.4	27	62.8	17	45.9	10	40.0	92	54.4
At childbirth/										
curettage	21	32.8	9	20.9	15	40.5	14	56.0	59	34.9
After childbirth	1	1.6	2	4.7	1	2.7	-	-	4	2.4
Unrealized	-	-	-	-	-	-	1	4.0	1	0.6
Ignored	3	4.7	5	11.6	4	10.8	-	-	12	7.1
Blank	1	1.6	-	-	-	-	-	-	1	0.6
Nontreponemical test at childbirth/										
curettage										
Reactive	57	89.1	38	88.4	33	89.2	24	96.0	152	89.9
Non-reactive	5	7.8	4	9.3	1	2.7	1	4.0	11	6.5
Unrealized	1	1.6	1	2.3	3	8.1	-	-	5	3.0
Ignored	1	1.6	-	-	-	-	-	-	1	0.6
Confirmatory treponemal test at childbirth/										
curettage										
Reactive	15	23.4	33	76.7	28	75.7	21	84.0	97	57.4
Non-reactive	-	-	3	7.0	6	16.2	2	8.0	11	6.5
Unrealized	37	57.8	3	7.0	3	8.1	2	8.0	45	26.6
Ignored	12	18.8	4	9.3	-	-	-	-	16	9.5
Maternal treatment regimen										
Adequate	-	-	4	9.3	2	5.4	2	8.0	8	4.7
Inadequate	29	45.3	19	44.2	13	35.1	11	44.0	72	42.6
Unrealized	34	53.1	19	44.2	22	59.5	12	48.0	87	51.5
Ignored	1	1.6	1	2.3	-	-	-	-	2	1.2
Partner(s) treated concomitantly with the pregnant woman										
Yes	6	9.4	5	11.6	6	16.2	3	12.0	20	11.8
No	48	75.0	36	83.7	27	73.0	9	36.0	120	71.0
Ignored	10	15.6	2	4.7	4	10.8	13	52.0	29	17.2
Total	64	100.0	43	100.0	37	100.0	25	100.0	169	100.0

Characterization of children reported with congenital syphilis in 2016-2019 quadrennium

In the 2016-2019 quadrennium, the city of Vitoria had 169 cases of congenital syphilis, according to the year of diagnosis, number decreasing over the 4 years: 64 cases in 2016 (37.9%), 43 in 2017 (25.4%), 37 in 2018 (21.9%) and 25 in 2019 (14.8%). Amongst the cases, 45.3% were male and 43.8% were female. Almost all cases were younger than 1 year old and only 1 case (0.6%) was 1 year old. The predominant race/color was brown (64.5%), followed by white (10.1%) and black (2.4%) (Table 2).

The nontreponemal test was positive in peripheral blood in 62.7%. Amongst the patients with a nontreponemal reactive test, 53.2% had a titer higher than 1/8, and 46.2% had a titer less or equal to 1/8 (Table 3).

Regarding cases of congenital syphilis, 68.6% of patients had a non-reactive CSF treponemal test, and 5.3% had a reactive test. Of the 9 cases with a positive nontreponemal test in the CSF, 77.8% (7 cases) had a titer higher than 1/8, and 22.2% (2 cases) had a titer less than 1/8. Considering the laboratory analysis of the liquor, 60.9% showed no variations. Variations in the examination of long bones were found in 5 cases (3%) (Table 3).

Table 2: Sociodemographic data of congenital syphilis in Vitoria residents– 2016 to 2019.

Variables	Year of diagnosis									
	2016		2017		2018		2019		Total	
	n	%	n	%	n	%	n	%	n	%
Gender										
Male	29	45.3	16	37.2	16	43.2	11	44.0	72	42.6
Female	28	43.8	20	46.5	20	54.1	13	52.0	81	47.9
Ignored	7	10.9	7	16.3	1	2.7	1	4.0	16	9.5
Age (Complete yo)										
Younger than 1 yo	64	100.0	43	100.0	36	97.3	25	100.0	168	99.4
1 yo	-	-	-	-	1	2.7	-	-	1	0.6
Race/color										
White	6	9.4	2	4.7	4	10.8	5	20.0	17	10.1
Black	2	3.1	-	-	-	-	2	8.0	4	2.4
Brown	36	56.3	32	74.4	27	73.0	14	56.0	109	64.5
Ignored	17	26.6	8	18.6	6	16.2	3	12.0	34	20.1
Blank	3	4.7	1	2.3	-	-	1	4.0	5	3.0
Total	64	100.0	43	100.0	37	100.0	25	100.0	169	100.0

Table 3: Clinical-laboratorial data of congenital syphilis in Vitoria residents – 2016 to 2019.

Variables	Year of diagnosis									
	2016		2017		2018		2019		Total	
	n	%	n	%	n	%	n	%	n	%
Nontreponemal test – Peripheral Blood										
Reactive	43	67.2	24	55.8	23	62.2	16	64.0	106	62.7
Non-reactive	12	18.8	15	34.9	9	24.3	5	20.0	41	24.3
Unrealized	5	7.8	4	9.3	5	13.5	4	16.0	18	10.7
Ignored	1	1.6	-	-	-	-	-	-	1	0.6
Blank	3	4.7	-	-	-	-	-	-	3	1.8
Results										
Less or equal to 1:8	22	51.2	10	41.7	8	34.8	9	56.3	49	46.2
Higher than 1:8	21	48.8	14	58.3	15	65.2	7	43.8	57	53.8
Subtotal	43	100.0	24	100.0	23	100.0	16	100.0	106	100.0
Nontreponemal test - Liquor										
Reactive	2	3.1	3	7.0	1	2.7	3	12.0	9	5.3
Non-reactive	45	70.3	30	69.8	24	64.9	17	68.0	116	68.6

Continuatio - Table 3: Clinical-laboratorial data of congenital syphilis in Vitoria residents – 2016 to 2019.

Variables	Year of diagnosis									
	2016		2017		2018		2019		Total	
	n	%	n	%	n	%	n	%	n	%
Unrealized	13	20.3	9	20.9	11	29.7	5	20.0	38	22.5
Ignored	1	1.6	1	2.3	1	2.7	-	-	3	1.8
Blank	3	4.7	-	-	-	-	-	-	3	1.8
Results										
Less or equal to 1:8	1	50.0	-	-	1	100.0	-	-	2	22.2
Higher than 1:8	1	50.0	3	100.0	-	-	3	100.0	7	77.8
Subtotal	2	100.0	3	100.0	1	100.0	3	100.0	9	100.0
Evidence of T. pallidum										
Yes	-	-	-	-	-	-	1	4.0	1	0.6
No	16	25.0	5	11.6	3	8.1	3	12.0	27	16.0
Unrealized	27	42.2	29	67.4	32	86.5	18	72.0	106	62.7
Ignored	18	28.1	9	20.9	2	5.4	3	12.0	32	18.9
Blank	3	4.7	-	-	-	-	-	-	3	1.8
Cerebrospinal fluid variation										
Yes	1	1.6	4	9.3	9	24.3	4	16.0	18	10.7
No	45	70.3	30	69.8	11	29.7	17	68.0	103	60.9
Unrealized	12	18.8	8	18.6	11	29.7	4	16.0	35	20.7
Ignored	3	4.7	1	2.3	6	16.2	-	-	10	5.9
Blank	3	4.7	-	-	-	-	-	-	3	1.8
Variation in the Long Bones Exam										
Yes	-	-	2	4.7	1	2.7	2	8.0	5	3.0
No	34	53.1	27	62.8	22	59.5	18	72.0	101	59.8
Unrealized	11	17.2	8	18.6	5	13.5	5	20.0	29	17.2
Ignored	16	25.0	6	14.0	9	24.3	-	-	31	18.3
Blank	3	4.7	-	-	-	-	-	-	3	1.8
Clinical diagnosis										
Asymptomatic	44	68.8	33	76.7	28	75.7	21	84.0	126	74.6
Symptomatic	7	10.9	7	16.3	4	10.8	2	8.0	20	11.8
Not applicable	5	7.8	3	7.0	5	13.5	2	8.0	15	8.9
Ignored	5	7.8	-	-	-	-	-	-	5	3.0
Blank	3	4.7	-	-	-	-	-	-	3	1.8
Total	64	100.0	43	100.0	37	100.0	25	100.0	169	100.0

As for the clinical diagnosis, 74.6% of the cases were asymptomatic and 11.8% were symptomatic. Amongst the signs and symptoms presented, the most frequent were: jaundice, anemia, hepatomegaly and splenomegaly.

Regarding the treatment regimen, 30.2% of the patients received Penicillin G Crystalline 100,000 to 150,000 IU/Kg/day/10 days; 14.8%, Penicillin G Benzathine 50,000 IU/Kg/day/single dose; 5.9%, Penicillin G Procaine 50,000 IU/Kg/day/10 days; 36.1% of patients received another regimen.

Regarding the evolution of cases in neonates, it was obtained the following figures: 143 (84.6%) remained

alive; 3 (1.8%) died from congenital syphilis; 3 (1.8%) died by other causes; 11 (6.5%) resulted in abortion; 5 (3%) stillbirths; and in 4 cases (2.4%) the evolution was reported as ignored.

The follow-up indicator for congenital syphilis in newborns who were born alive was 69.8% in 2016, 79.5% in 2017, 84.4% in 2018, and 85.7% in 2019.

Comparing the incidence rates of congenital syphilis in Brazil, in the Southeast Region, in the state of Espírito Santo and in Vitoria, there was a sharp and constant increase from 2010 to 2016 – except in 2014, in Vitoria. Nevertheless, this rate reduced significantly in

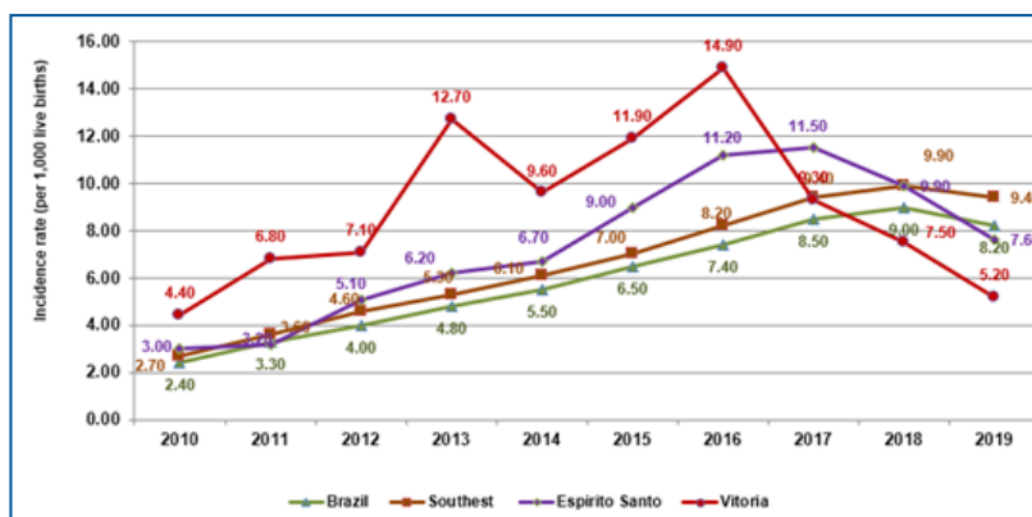


Figure 1: Congenital syphilis incidence rate (/1,000 live births), according to the year of diagnosis and place of residence – from 2010 to 2019.

SOURCE: MS/SVS/Department of Chronic Condition Diseases and Sexually Transmitted Infections. NOTES: (1) Data up to 2020/June/30; (2) Preliminary data for the last 5 years.

Vitoria between 2016 and 2017, which was not observed in Espírito Santo State, in the Southeast region or in Brazil. Considering the 2016-2019 quadrennium, there was a significant reduction in the incidence rate of congenital syphilis in Vitoria, from 14.65/1000 live births to 5.20/1000 live births in 2019 (Figure 1).

DISCUSSION

In 2016, Vitoria (ES), one of the capital cities of Southeast Brazil, implemented the “Plan of Elimination Vitoria Against Syphilis”, with eight axes of action. Its execution has been carried out with a focus on improving the actions against the disease⁸.

There are several reasons for congenital syphilis constant occurrences: All mainly involving populations with a more limited access to resources, of which are considered: late or unrealized prenatal consultations, no provision of tests or not fetching of results; treatment unavailable after test results; treated women reinfected by untreated sexual partners¹⁷.

A study carried out in Fortaleza, with 478 cases of congenital syphilis, found an outcome of prematurity in 15.3% of the cases. Factors associated with prematurity were: infected pregnant women treated with some drug other than Penicillin Benzathine/no treatment (factor with higher risk), followed by VDRL with titer > 1/8¹⁸.

In the 2016-2019 quadrennium, the number of cases of congenital syphilis had a significant reduction in Vitoria (ES), ranging from 64 cases in 2016 to 25 cases in 2019. It is established in literature that infected children may have low development or remain asymptomatic for years, presenting apparent neurological complications only later in life¹⁹. Therefore, follow-up is necessary, provided in the Plan to Eliminate Syphilis⁸.

The predominant mothers' age group was young – 44.5% was aged from 20 to 29 – corroborating the study carried out in Fortaleza (CE), which also found syphilis occurrences in young women¹³. Furthermore, a total of 42 mothers aged between 10 and 19 were observed, a percentage of 24.9% of the total, which made us reflect

on the severity of child marriage and its consequences, considering that it is a violation of human rights. Brazil is the fourth country in the world in terms of child marriage, affecting mainly girls; a problem that is still relatively invisible to Brazilian society²⁰.

The predominant mothers' race/color was brown, followed by black and white. In New York, from 2010 to 2016, of the 68 women who gave birth to a baby with congenital syphilis, 77.9% were between 20 and 29 years old, black, and 55.4% were born outside the United States²¹.

Amongst the total reported, the maternal education variable had a significant incompleteness. Notwithstanding, mothers presented low education, especially elementary school, analogous to the study carried out in Recife²².

Most mothers reported having received prenatal care (72.2%), predominantly in the city of Vitoria. In 54.4% of mothers, the diagnosis of syphilis occurred during the prenatal period. These data raises questions about the prenatal care quality, as studies claim that the elimination of syphilis mother-to-child transmission will only become a reality in the Americas through provision of high quality prenatal care services^{17,23}.

In this study, of the total number of mothers reported with syphilis during pregnancy, 57.4% had a reactive treponemal test. In Brazil, although the offer of rapid syphilis testing is increasing, its use and coverage in Primary Care have not yet been satisfactory²⁴.

Of the mothers who underwent the nontreponemal test, 89.9% had a reactive test. In most cases (63.2%), the titration of the nontreponemal test was less or equal to 1/8. However, 51.5% did not undergo treatment and 42.6% underwent inadequate treatment. A study developed in Fortaleza-CE revealed that more than 85.0% of treatments were inadequate¹³.

In Vitoria, it is recommended the pregnant woman to undergo nontreponemal testing at least four times: in the first quarter (first consultation), in the second quarter, at the beginning of the third quarter (from the 28th week) of pregnancy and at the time of childbirth. Considering that the woman can be reinfected each time she is exposed,

more frequent screening for the disease during pregnancy is justified³.

As for the partners of these mothers, 71% did not receive treatment concomitantly. A study carried out in Fortaleza (CE) reported 62.9% of untreated sexual partners¹⁹. In Brazil, acquired syphilis has reached the youngest segments of the population – mainly men –, requiring the promotion of comprehensive human health through intersectoral strategies, including prevention actions in schools and in youth interaction networks⁹.

Eventually, the treatment of these mothers was not accomplished, due to low titrations. In some situations, health professionals did not offer the treatment because they believed it was the mother's immunological memory. To avoid these conducts, technical notes have been made available to all professionals over the last few years, warning against the presumption of immunological memory without adequate evidence of previous treatment, registered in the medical records²⁵.

The CS cases were predominantly of race/color brown, followed by white and black; and the frequency of males was close to that of females. When added the percentages of race/color brown and black, it was obtained 66.9% of cases. There are still many obstacles for the black population to accessing health care services²⁵.

As for the exams of CS cases, the nontreponemal peripheral blood test was positive in 62.7% and had a titer higher than 1/8 in 53.2% of the cases. The negative results of the nontreponemal test in peripheral blood, at the time of childbirth, can become reactive later, and following-up each case is essential¹³.

The CSF nontreponemal test was performed in 73.9% of the cases, and in 5.3% the result of this test was positive. In a study in Fortaleza-CE it was found out a high percentage of unrealized tests for the investigation of CS in children²⁶.

In the quadrennium 2016-2019, the X-ray of long bones was done in 62.8% of cases and revealed changes in 3% of cases. In a study carried out in the city of Fortaleza-CE, the radiological diagnosis was accomplished in 60.4% of cases and, of these, 5.9% showed alterations²⁷.

In this study, only 11.8% of CS cases were symptomatic; some of them had more than one sign, with jaundice being the most frequent. Amongst the consequences of CS in newborns are: low birth weight, severe anemia, jaundice, and hepatosplenomegaly¹⁹.

Penicillin G Procaine or G Benzathine, in their various regimens, have been the chosen treatment for congenital syphilis in Vitoria, being considered highly effective in all stages of syphilis, with no remark of *T. pallidum* resistance²⁸. Studies have identified missed opportunities for CS treatment in Brazil¹³ and worldwide^{20,29}.

As for the evolution of cases in the four-year period, the highest percentage of deaths was due to abortion, followed by stillbirth. According to literature data, 40% of babies born to untreated women with syphilis are stillborn¹⁹.

Regarding the follow-up of CS cases, there had been a progressive improvement in this indicator in the four-year period. However, since the ideal is to achieve 100% of follow-up, there are some obstacles to be overcome, so that all information on the follow-up of cases become available in children's electronic medical records, especially those monitored outside the Municipal Health Chain.

Regarding the incidence rate of congenital syphilis in the city of Vitoria, it ranged from 14.65 cases per 1000 live births, in 2016, to 5.20 cases per 1000 live births, in 2019. In 2016, Vitoria had the lowest birth rate in the historical series, reputed to the Zika virus epidemic that started in April 2015. This had an influence on the incidence rate of the disease in 2016, when this rate was the highest in the entire historical series, in parallel with the increase of this rate across the country⁶.

Throughout the quadrennium 2016-2019, personnel had been offered several trainings on prevention, treatment, and control of syphilis. In addition, the Welfare Chain Computerized Management System (SGIRBE) allowed the Telehealth tool to be accessed and used by health staff in all health units, emergency services, pharmacies, dental services, laboratory services, referral centers and specialties¹⁴.

Since 2014, the World Health Organization (WHO) has been conducting a process to validate the countries elimination of mother-to-child transmission of HIV and syphilis, with guidelines based on human rights, gender equality and community involvement³⁰.

It was a limitation of this study that it only analyzed secondary data, being subject to fill in failure and/or incomplete information. In addition, as the follow-up indicator of congenital syphilis was based on a search for entries in electronic medical records, failures in the medical records had possibly occurred. The lack of connection of information from external services with municipal services may have contributed to an underestimation of this indicator.

CONCLUSION

The analysis of the four-year cases allowed us to conclude that non-treatment, inadequate treatment of pregnant women - amongst those who underwent prenatal care - and reinfection were the main factors that influenced the rise of CS cases, signaling the need for advances in the quality of prenatal care. Once diagnosed, newborns should be immediately treated, since missed opportunities for treating congenital syphilis have been identified as important causes of infant mortality¹³.

In the 2016-2019 quadrennium, the city of Vitoria had a significant reduction in the number of cases of congenital syphilis and in the incidence rate of this disease, with improvements in the follow-up indicator of congenital syphilis, having the Plan to Eliminate Syphilis as a guideline for carrying out the actions.

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Resumo

Introdução: a sífilis congênita continua sendo um grave problema de saúde pública no Brasil e no mundo, sendo as infecções fetais antenatais as principais causas de morbidade e mortalidade global.

Objetivo: analisar os casos de sífilis congênita e um indicador de resultado da qualidade da assistência ao binômio mãe/recém nascido em Vitória (ES), no quadriênio 2016-2019.

Método: estudo de abordagem quantitativa, que avaliou o indicador “seguimento da sífilis congênita”. Os dados foram coletados no Sistema de Informação de Agravos de Notificação (SINAN), referentes ao período de 1.º de janeiro de 2016 a 31 de dezembro de 2019. As informações referentes ao seguimento dos RN com SC ocorreram mediante busca em prontuário eletrônico, no período de 1.º de agosto de 2020 a 31 de março de 2021.

Resultados: no quadriênio 2016-2019, o município de Vitória teve 169 casos de sífilis congênita, pelo critério ano de diagnóstico. Esse indicador foi decrescente ao longo do quadriênio: 64 casos em 2016 (37,9%), 43 em 2017 (25,4%), 37 em 2018 (21,9%) e 25 em 2019 (14,8%). O teste não treponêmico foi reagente em 62,7% dos casos. Em 10,7%, houve alterações na análise laboratorial do líquido; 3%, alteração no exame de ossos longos; 5,3%, teste não treponêmico reagente no líquido; e 11,8% apresentaram-se sintomáticos ao nascimento. A taxa de incidência sífilis congênita, que em 2016 se encontrava em 14,65/1000 nascidos vivos, chegou a 5,58/1000 nascidos vivos em 2019. O indicador de seguimento dos casos de sífilis congênita que nasceram vivos foi de 69,8% em 2016, 79,5% em 2017, 84,4% em 2018 e 85,7% em 2019.

Conclusão: houve significativa redução do número de casos de sífilis congênita, da taxa de incidência da doença e melhoria progressiva do seguimento da sífilis congênita, tendo, como diretriz, o Plano de Enfrentamento da Sífilis.

Palavras-chave: sífilis congênita, transmissão vertical de doença infecciosa, monitoramento epidemiológico, avaliação em saúde.