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LIVER SEROLOGICAL ANALYSIS IN CHILDREN WITH CONGENITAL SYPHILIS IN A TEACHING MATERNITY HOSPITAL IN NORTHEAST BRAZIL

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Abstract: Introduction: The present study aims to analyze the liver function in newborns with congenital syphilis of mothers who tested positive for syphilis during pregnancy in the year 2021/2022 at Maternity and Hospital Santa Isabel, in the state of Sergipe. **Methodology:** This is an epidemiological, observational, retrospective and analytical study of paper records from the congenital syphilis outpatient clinic of the maternity unit of the study. Data were analyzed and interpreted using descriptive and inferential statistics. Analyzing and comparing newborns from the criteria of diagnosis and treatment of cases of congenital syphilis of the Ministry of Health, maternal epidemiology, birth conditions of babies, physical examination, laboratory prioritizing liver serology. **Results:** 113 children of mothers were analyzed. The evaluated age of these children was 0-23 months. According to the results obtained in the research, a predominance of young adult mothers, with a low level of education, without paid work, can be observed. In the first consultation, as well as in the second, of the outpatient follow-up, the children showed both increase and decrease in the requested laboratory parameters (red and white series, Na, total BT and fractions, TGO, TGP, FA, GT Gamma). Regarding the symptoms, 36.3% of the children had hepatomegaly greater than 3 cm and 39.8% had no symptoms. **Conclusion:** The research reveals the socioeconomic level of vertical transmission of syphilis. In the inferential statistics when comparing hepatomegaly with biochemical tests related to liver function, a positive association was found with a higher proportion of hepatomegaly > 3 cm and altered TGP.

Keywords: congenital syphilitic hepatitis, congenital syphilis, maternity in the Northeast, liver disease.

INTRODUCTION

Syphilis is a sexually transmitted, infectious, systemic, curable, preventable infection that, when not properly treated, can progress to metabolic changes and irreversible sequelae. The worst outcome is congenital syphilis, which can lead to blindness, deafness, bone lesions, meningitis, neurodevelopmental disorders, syphilitic hepatitis, among others.

According to the World Health Organization (WHO), it is estimated that around 12 million new cases of syphilis occur annually in the world, emphasizing that, of these, 1.5 to 1.85 million of the records found are of pregnant women, and that 50% of them have children with adverse outcomes due to the consequences of the disease. According to the October 2021 Syphilis Epidemiological Bulletin, Brazil had 7.7 cases of congenital syphilis per 1,000 live births, of which 28.2% were from the Northeast region. Sergipe had an incidence of 16.6 cases per 1,000 live births, ranking second in the Brazilian state with the highest incidence rate of the disease, behind only Rio de Janeiro.

Congenital syphilis occurs through bacterial dissemination of Treponema pallidum from an infected pregnant woman who is not treated or inadequately treated for her fetus, via the transplacental (vertical) route. This transmission occurs by hematogenous spread at any gestational stage or clinical stage of the disease.

As transmission occurs via the hematogenous route, any organ can be affected. The liver is one of them and hepatomegaly is a very frequent finding on physical examination. Liver evaluation, performed at birth and at follow-up, is crucial for the diagnosis of syphilitic hepatitis. The greater the amount of altered enzymes, the greater the chance of having liver fibrosis, which can impact on increased mortality and quality of life for these children.

Laboratory alterations include: anemia, thrombocytopenia, leukocytosis (leukemoid reaction, lymphocytosis and monocytosis may occur) or leukopenia. In addition, changes in liver enzymes such as AST, ALT, GGT, albumin and bilirubin may appear.

Based on what was exposed by the severity and high incidence of congenital syphilis in the state of Sergipe, this study aims to analyze liver enzymes in children with congenital syphilis diagnosed and treated according to the criteria of the Ministry of Health, maternal epidemiology, physical examination, and follow-up. in the years 2021.1 to 2022.2.

METHODOLOGY

Epidemiological, observational, retrospective and analytical study, in which data were collected from newborns of mothers who tested positive for syphilis during pregnancy in the year 2021/2022 at the Teaching Maternity Hospital, in the state of Sergipe, in order to analyze liver changes in newborns with congenital syphilis. The data obtained came from immediate postnatal examinations, as well as from follow-up consultations held at the outpatient clinic at the study site.

Neonatal data such as: type of delivery, birth weight, length, symptoms, laboratory alterations, anamnesis and physical examination were considered. Maternal data were also considered, such as: number of prenatal consultations, adequate treatment or not for syphilis, including partner treatment, income, schooling, skin color, gynecological history.

Data were analyzed and interpreted using descriptive and inferential statistics. Categorical variables were presented using simple and relative frequencies and numerical variables were presented as mean ± standard deviation. In the inferential part, the chi-square test with or without Montecarlo

simulation and Fisher's exact test were used, when more appropriate depending on the assumptions of the tests, to discover associations between the categorical variables. In order to investigate differences between measurements taken at the first visit by those with abnormal or normal liver enzymes, the Student's t-test was used for independent samples. Data normality was assessed using Shapiro-Wilk tests. The assumption of homogeneity of variance was evaluated using Levene's test. Bootstrapping procedures were performed (1000 resamplings; 95% CI BCa) to obtain greater reliability of the results, to correct deviations from normality of the sample distribution and differences between the size of the groups and, also, to present a confidence interval of 95% for differences between means (Haukoos & Lewis, 2005). The stipulated level of statistical significance will be 5% ($p \leq 0.05$) and all tests were two-tailed. The software used for the analysis will be the Statistical Package for the Social Sciences (IBM SPSS 28.0).

RESULTS

We analyzed 113 children of mothers with a positive non-treponemal test for syphilis and diagnosed with congenital syphilis through the criteria for defining the disease of the Ministry of Health, 2017. There were 62 males and 51 females, followed in a teaching maternity hospital Sergipe in the period from 2020.2 to 2022.1. The evaluated age of these children was 0-23 months, with a predominance of (1.71 ± 2.76 months) at the first consultation and (5.91 ± 2.67 months) at the second consultation.

The mothers of these children had age (24.19 ± 6.49 years), brown skin color as the most prevalent (55 women), (44) had incomplete elementary education as well as schooling, (96) lived in urban areas, (49) receive a family allowance, (85) are unemployed, (35) receive up to half the minimum wage, (84) with normal births. They started prenatal care at (3.7 ± 1.61 months) and performed (6.21 ± 3.03 prenatal consultations). In addition, they had a number of (2.07 ± 1.41 children), and abortions plus stillbirths of (0.41 ± 0.77).

The children were born with a gestational age of (38.99 ± 1.25 weeks), and six of them had premature delivery. They presented Apgar values at 1 minute and 5 minutes within the normal range. In addition, they also showed a head circumference value (34.50 ± 1.51 cm) at birth, with 14 individuals presenting microcephaly, adequate length (48.34 ± 2.03 cm) and weight (3269.49 ± 472 cm).73 g), with seven children classified as low weight.

Most children received treatment with crystalline penicillin (n = 95), mothers were treated adequately in 74.3% of cases and fathers, according to the reports of their partners, in 47%. Regarding the symptoms, 36.3% of the children had hepatomegaly greater than 3 cm and 39.8% had no symptoms.

At the first follow-up visit, only three children presented with leukopenia, two with thrombocytopenia, two with thrombocytosis, one with hypokalemia, fourteen with hyponatremia, forty-five with decreased total bilirubin and thirteen above the reference values, one with increased direct bilirubin and fifty-two with a decrease, eight with an increase in indirect bilirubin and 2 with a decrease, nineteen with an increase in alkaline phosphatase, one with a decrease and six with an increase in GT Gamma, two with a decrease and four with an increase in TGO, and on the TGP, eighteen showed a decrease and five showed an increase in relation to the reference.

At the second follow-up visit, ten children with anemia, one with erythrocytosis, five with a decrease and one with an increase in hematocrit, two with leukopenia, twenty-

one with thrombocytopenia, two with thrombocytosis, seven with an increase in alkaline phosphatase, two with a decrease in Gamma GT. One child had an increase in TGO and one in TGP. Seventeen exhibited a decrease in total bilirubin, and eighteen values below normal in relation to indirect bilirubin.

Feature	Frequency	Number	min-max
maternal education		109	
illiterate	2 (1.8)		
Incomplete fundamental	44 (38.9)		
complete fundamental	12 (10.6)		
incomplete high school	19 (16.8)		
complete medium	27 (23.9)		
Incomplete higher	4 (3.5)		
Graduated	1 (0.9)		
Apgar 1 min	8.61 ± 1.08	109	1 - 9
Apgar 5min	9.54 ± 0.75	109	4 - 10
prenatal consultations	6.21 ± 3.03	103	0 - 16
Start of prenatal care (Month)	3.70 ± 1.61	91	1 - 9
maternal age	24.19 ± 6.49	112	14 - 41
maternal occupation		88	77.9
Employee	25 (22.1		
unemployed	85 (75.2)		
family scholarship	49 (43.4)	107	
paternal age	28.38 ± 8.83	100	16 - 61
paternal occupation		88	77.9
Employee	69 (61.1)		
Unemployed	19 (16.8)		
mother's skin color		99	87.6
White	22 (19.5)		
brown	55 (48.7)		
black	22 (19.5)		
Number of children	2.07 ± 1.41	113	1 - 8
abortions and stillbirths	0.41 ± 0.77	113	0 – 5
Zone		110	97.3
Rural	14 (12.4)		
urban	96 (85.0)		
Income		101	89.4
Up to half minimum wage	35 (31.0)		
From half to minimum wage	35 (31.0)		
From 1 to 2 minimum wages	24 (21.2)		
Above 2 minimum wages	7 (6.2)		
baby sex		113	
Feminine	51 (45.1)		
Male	62 (54.9)		

type of delivery		111	98.2
Normal	84 (74.3)		
cesarean	27 (23.9)		
Gestational age (weeks)	38.99 ± 1.25	109	35 - 42
PC birth	34.50 ± 1.51	109	31.5 - 39
birth stature	48.34 ± 2.03	110	44 - 54
birth weight	3269.49 ± 472.73	112	2340 - 4315

Numerical data are displayed as mean ± standard deviation.

Categorical data are displayed in absolute sample size (%).

Table 1. General aspects of the sample.

Feature	Frequency	Number	min-max
mother's symptoms		112	99.1
not asked	68 (60.2)		
don't know how to inform	1 (0.9)		
no symptoms	8 (7.1)		
deny symptoms	28 (24.8)		
Pemphigus	1 (0.9)		
Hand and foot injury	1 (0.9)		
generalized peeling	1 (0.9)		
fever and rash	1 (0.9)		
rash	3 (2.7)		
Father's Symptoms		112	99.1
not asked	68 (60.2)		
no symptoms	10 (8.8)		
deny symptoms	29 (25.7)		
symptomatic/secondary	1 (0.9)		
alopecia	1 (0.9)		
penile cancer	1 (0.9)		
fever and rash	1 (0.9)		
rash	1 (0.9)		
Baby Symptoms			
no symptoms	45 (39.8)		
deny symptoms	3 (2.7)		
BP	2 (1.8)		
BP + HM	2 (1.8)		
BP + PT	1 (0.9)		
Rash + HM	1 (0.9)		
HM + neurosyphilis	1 (0.9)		
MH + Prematurity	1 (0.9)		
HM + PM	1 (0.9)		
hepatomegaly	54 (47.8)		
Hepatomegaly from 3 cm	41 (36.3)		
Father treatment		99	87.6
Does not know/Deceased	3 (2.7)		

Not treated	33 (29.2)		
Treated	1 (0.9)		
handled inappropriately	11 (9.7)		
properly handled	52 (47.0)		
Mother treatment		103	91.2
Not treated	2 (1.8)		
handled inappropriately	17 (15.0)		
properly handled	84 (74.3)		
properly handled	84 (74.3)		
baby treatment		113	100
Benzathine Penicillin	6 (5.4)		
PB - PC	1 (0.9)		
crystalline penicillin	95 (84.1)		
Penicillin - Procaine	10 (8.8)		
procaine	1 (0.9)		
Age 1 consultation (months)	1.71 ± 2.76	112	0 - 23

Numerical data are displayed as mean ± standard deviation.

Categorical data are displayed in absolute sample size (%).

Table 2. First consultation.

Feature	Frequency	Number	min-max
PRAÇA	38.44 ± 2.53	109	33.5 - 47
Stature	55.75 ± 5.41	110	47.5 - 74
Weight	4820.87 ± 1428.03	110	2780 - 10415
Hb	11.51 ± 2.71	71	8.5 - 30.7
Below	30 (26.5)		
Normal	40 (35.4)		
Above	1 (0.9)		
HT	31.72 ± 5.23	70	10.6 - 43.9
Below	29 (25.7)		
Normal	41 (36.3)		
FAN	280.9 ± 116.29	62	24 - 503
Below	2 (1.8)		
Normal	41 (36.3)		
Above	19 (16.8)		
Albumin	3.22 ± 0.60	46	1.24 - 5.03
Below	9 (8.0)		
Normal	36 (31.9)		
Above	1 (0.9)		
K	4.93 ± 0.55	58	3.4 - 6.60
Below	1 (0.9)		
Normal	57 (50.4)		
At	134.84 ± 18.03	59	1.37 - 144
Below	14 (12.4)		
Normal	45 (39.8)		

BT	2.09 ± 6.32	65	0.10 - 49
Below	45 (39.8)		
Normal	7 (6.2)		
Above	13 (11.5)		
DB	0.387 ± 0.79	64	0.04 - 6.33
Normal	63 (55.8)		
Above	1 (0.9)		
BI	1.01 ± 1.87	64	0.04 - 11.49
Below	52 (46.0)		
Normal	4 (3.5)		
Above	8 (7.1)		
leukocytes	9172.11 ± 2577.29	71	4400 - 17500
Below	3 (2.7)		
Normal	68 (60.2)		
platelets	400385.71 ± 112919.91	70	187000 - 726000
Below	3 (2.7)		
Normal	65 (57.5)		
Above	2 (1.8)		
GT range	61.01 ± 58.48	64	6 - 320
Below	1 (0.9)		
Normal	57 (50.4)		
Above	6 (5.3)		
TGO	40.39 ± 21.73	67	5 - 164
Below	2 (1.8)		
Normal	61 (54.0)		
Above	4 (3.5)		
TGP	31.21 ± 20.23	63	12 - 121
Below	18 (15.9)		
Normal	40 (35.4)		
Above	5 (4.4)		

Numerical data are displayed as mean ± standard deviation.

Categorical data are displayed in absolute sample size (%).

Table 3. First consultation - Baby measurements.

Feature	Frequency	Number	min-max
age in months	5.91 ± 2.67	57	2 - 14
Hb	11.32 ± 1.45	22	8.2 - 14.9
Below	10 (8.8)		
Normal	11 (9.7)		
Above	1 (0.9)		
Ht	32.89 ± 4.17	22	25.3 - 44.80
Below	5 (4.4)		
Normal	16 (14.2)		
Above	1 (0.9)		
Albumin	3.55 ± 0.40	15	2.95 - 4.48

Normal	15 (13.3)		
FAN	262.4 ± 109.02	20	64 - 551
Normal	13 (11.5)		
Above	7 (6.2)		
leukocytes	9474.68 ± 3540.31	22	2100 - 17700
Below	2 (1.8)		
Normal	20 (17.7)		
platelets	369363.64 ± 121169.5	22	140000 – 597000
Below	1 (0.9)		
Normal	19 (16.8)		
Above	2 (1.8)		
BT	0.37 ± 0.33	18	0.07 - 1.39
Below	17 (15.0)		
Normal	1 (0.9)		
DB	0.21 ± 0.32	17	0.02 - 1.36
Normal	17 (15.0)		
BI	0.16 ± 0.14	18	0.03 - 0.50
Below	18 (15.9)		
GT range	34.28 ± 32.48	20	10.6 - 127
Below	2 (1.8)		
Normal	18 (15.9)		
TGO	43.05 ± 7.36	21	23 - 58
Normal	20 (17.7)		
Above	1 (0.9)		
TGP	31.90 ± 28.32	21	17 - 153
Below	10 (8.8)		
Normal	10 (8.8)		
Above	1 (0.9)		
PRAÇA	43.55 ± 2.59	49	37 - 49
Stature	66.12 ± 6.18	49	51.5 - 81
Weight	7716.04 ± 1576.81	56	5274 - 11740

Numerical data are displayed as mean ± standard deviation.

Categorical data are displayed in absolute sample size (%).

Table 4. Second query.

	HB first consultation			P
	changed	Normal	Total	
Hepatomegaly > 3cm [1]				0.792
Yea	11 (35.5)	13 (32.5)	24 (33.8)	
No	20 (64.5)	27 (67.5)	47 (66.2)	
Mother's treatment [2]				0.215
untreated	0 (0.0)	1 (2.7)	1 (1.6)	
handled inappropriately	8 (29.6)	5 (13.5)	13 (20.3)	
properly treated	19 (70.4)	31 (83.8)	50 (78.1)	
Prenatal consultations [3]	6.20 ± 2.80	6.03 ± 3.32	N (30; 35)	0.824

Beginning of prenatal care [3]	3.59 ± 1.40	4.00 ± 2.03	N (29; 30)
gestational age [3]	38.97 ± 1.52	39 ± 1.11	N (30; 38)
Weight Inquiry 1 [3]	5368.94 ± 1620.84	5020.94 ± 1440.25	N (31; 38)
Height Consultation 1 [3]	57.91 ± 6.20	55.95 ± 5.26	N (30; 39)
PC Consultation 1 [3]	39.25 ± 2.74	38.86 ± 2.31	N (30; 39)

[1] Fisher's exact test.

[2] Chi-Square with MonteCarlo Simulation.

[3] t-Student for independent samples.

Table 5.

	HT first appointment			P
	changed	Normal	Total	
Hepatomegaly > 3cm [1]				0.293
Yea	12 (41.4)	12 (29.3)	24 (34.3)	
No	17 (58.6)	29 (70.7)	46 (65.7)	
Mother's treatment [2]				0.621
untreated	0 (00.0)	1 (2.7)	1 (1.6)	
handled inappropriately	7 (25.9)	6 (16.2)	13 (20.3)	
properly treated	20 (74.1)	30 (81.1)	50 (78.1)	
Prenatal consultations [3]	6.41 ± 3.16	5.78 ± 2.98	N (27; 37)	0.824
Beginning of prenatal care [3]	3.81 ± 1.60	3.79 ± 1.88	N (26; 33)	
gestational age [3]	39.18 ± 1.44	38.82 ± 1.19	N (28; 39)	
Weight Inquiry 1 [3]	5006.25 ± 1464.55	5284.45 ± 1586.70	N (28; 40)	
Height Consultation 1 [3]	55.87 ± 5.56	57.41 ± 5.90	N (28; 40)	
PC Consultation 1 [3]	38.59 ± 2.41	39.31 ± 2.57	N (28; 40)	

[1] Fisher's exact test.

[2] Chi-Square with MonteCarlo Simulation.

[3] t-Student for independent samples.

Table 6.

	FA first consultation			P
	changed	Normal	Total	
Hepatomegaly > 3cm [1]				0.907
Yea	8 (38.1)	15 (36.6)	23 (37.1)	
No	13 (61.9)	26 (63.4)	47 (66.2)	
Mother's treatment [2]				0.115
untreated	1 (5.6)	0 (0.0)	1 (1.8)	
handled inappropriately	6 (33.3)	7 (17.9)	13 (22.8)	
properly treated	11(61.1)	32 (82.1)	50 (75.4)	
Prenatal consultations [3]	6.41 ± 3.16	5.78 ± 2.98	N (19; 39)	0.915
Beginning of prenatal care [3]	3.81 ± 1.60	3.79 ± 1.88	N (17; 36)	0.351
gestational age [3]	39.18 ± 1.44	38.82 ± 1.19	N (20; 40)	0.101
Weight Inquiry 1 [3]	5536.33 ± 1273.21	5075.92 ± 1713.63	N (21; 39)	0.285
Height Consultation 1 [3]	58.63 ± 5.10	56.42 ± 6.23	N (20; 40)	0.177

PC Consultation 1 [3]	39.70 ± 1.99	38.96 ± 2.69	N (20; 40)	0.283

[1] Fisher's exact test

[2] Chi-Square with MonteCarlo Simulation

[3] t-Student for independent samples

Table 7

	Albumin first consultation			P
	changed	Normal	Total	
Hepatomegaly > 3cm [1]				0.282
Yea	2 (20.0)	15 (41.7)	17 (37.0)	
No	8 (80.0)	21 (58.3)	29 (63.0)	
Mother's treatment [2]				0.766
untreated	0 (0.0)	1 (2.9)	1 (2.3)	
handled inappropriately	2 (22.2)	10 (29.4)	12 (27.9)	
properly treated	7(77.8)	23 (67.6)	30 (69.8)	
Prenatal consultations [3]	6.40 ± 2.91	6.15 ± 3.22	N (10; 34)	0.825
Beginning of prenatal care [3]	3.90 ± 1.66	3.97 ± 1.96	N (10; 30)	0.924
gestational age [3]	38.78 ± 1.48	38.94 ± 1.29	N (9; 36)	0.737
Weight Inquiry 1 [3]	4579.44 ± 1625.89	5487.58 ± 1735.43	N (9; 36)	0.163
Height Consultation 1 [3]	54.64 ± 6.41	58.18 ± 6.10	N (9; 36)	0.131
PC Consultation 1 [3]	38.06 ± 3.14	39.54 ± 2.44	N (9; 36)	0.130

[1] Fisher's exact test.

[2] Chi-Square with MonteCarlo Simulation.

[3] t-Student for independent samples.

Table 8.

	in the first consultation			P
	changed	Normal	Total	
Hepatomegaly > 3cm [1]				0.665
Yea	5 (35.7)	19 (42.2)	24 (40.7)	
No	9 (64.3)	26 (57.8)	35 (59.3)	
Mother's treatment [1]				0.708
handled inappropriately	2 (15.4)	10 (24.4)	12 (22.2)	
properly treated	11 (84.6)	31 (75.6)	42 (77.8)	
Prenatal consultations [3]	7.08 ± 3.25	6.19 ± 2.86	N (13; 42)	0.349
Beginning of prenatal care [3]	3.67 ± 2.01	3.71 ± 1.56	N (12; 38)	0.937
gestational age [3]	38.69 ± 0.95	38.98 ± 1.37	N (13; 44)	0.488
Weight Inquiry 1 [3]	4878.92 ± 1543.27	5270.05 ± 1648.19	N (13; 44)	0.449
Height Consultation 1 [3]	55.71 ± 5.82	57.31 ± 6.13	N (13; 44)	0.409
PC Consultation 1 [3]	38.35 ± 3.00	39.23 ± 2.36	N (13; 44)	0.272

[1] Fisher's exact test.

[2] Chi-Square with MonteCarlo Simulation.

[3] t-Student for independent samples.

Table 9.

	BT first consultation			P
	changed	Normal	Total	
Hepatomegaly > 3cm [1]				0.212
Yea	8 (50.0)	16 (32.7)	24 (36.9)	
No	8 (50.0)	33 (67.3)	41 (63.1)	
Mother's treatment [2]				0.215
untreated	1 (7.1)	0 (0.0)	1 (1.7	
handled inappropriately	2 (14.3)	10 (22.7)	12 (20.7)	
properly treated	11 (78.6)	34 (77.3)	45 (77.6)	
Prenatal consultations [3]	6.5 ± 2.65	6.49 ± 3.02	N (14; 45)	0.990
Beginning of prenatal care [3]	4 ± 2.24	3.55 ± 1.47	N (11; 42)	0.421
gestational age [3]	39.13 ± 1.55	39.02 ± 1.25	N (15; 48)	0.775
Weight Inquiry 1 [3]	4274.75 ± 945.14	5550.62 ± 1623.17	N (16; 47)	<0.001 *
Height Consultation 1 [3]	53.45 ± 2.83	58.31 ± 6.11	N (16; 47)	<0.001 *
PC Consultation 1 [3]	37.81 ± 1.41	39.68 ± 2.49	N (16; 47)	<0.001 *
abortions and stillbirths	0.13 ± 0.50	0.51 ± 0.96	N (16; 49)	0.043 *
Apgar 5min	8.88 ± 1.45	9.72 ± 0.45	N (16; 49)	0.036 *

[1] Fisher's exact test * Significant at 5%.

[2] Chi-Square with MonteCarlo Simulation.

[3] t-Student for independent samples.

Table 10.

	TGP first consultation			P
	changed	Normal	Total	
Hepatomegaly > 3cm [1]				0.038 *
Yea	13 (56.5)	12 (30.0)	25 (39.7)	
No	10 (43.5)	28 (70.0)	38 (60.3)	
Mother's treatment [2]				0.398
untreated	1 (4.5)	0 (0.0)	1 (1.7)	
handled inappropriately	6 (27.3)	7 (19.4)	13 (22.4)	
properly treated	15 (68.2)	29 (80.6)	50 (75.9)	
Prenatal consultations [3]	6.10 ± 3.28	6.49 ± 2.82	N (21; 37)	0.317
Beginning of prenatal care [3]	3.95 ± 1.68	3.55 ± 1.82	N (22; 31)	0.306
gestational age [3]	38.95 ± 1.43	39.03 ± 1.28	N (22; 38)	0.842
Weight Inquiry 1 [3]	5383.00 ± 2022.73	5162.71 ± 1277.58	N (23; 38)	0.642
Height Consultation 1 [3]	57.43 ± 7.48	56.96 ± 4.72	N (23; 38)	0.784
PC Consultation 1 [3]	39.67 ± 2.79	38.93 ± 2.28	N (23; 38)	0.264

[1] Fisher's exact test * Significant at 5%.

[2] Chi-Square with MonteCarlo Simulation.

[3] t-Student for independent samples.

Table 11.

DISCUSSION

According to the results obtained in the research, it can be observed a predominance of young adult mothers, with a low level of education, who are unemployed and who have a source of income below 1 minimum wage, demonstrating the relevance of the socioeconomic level in the transmission of the syphilis vertically. According to Silva et al. (2015) through a study carried out in Pernambuco, a higher prevalence of congenital syphilis was observed in people in vulnerable situations, such as early age, low income, low level of education and unemployment. According to the above, the most vulnerable population to acquire syphilis is clear. Knowledge about disease prevention measures as well as symptoms and importance of treatment can lead to a reduction in prevalence, aiming at reducing vertical transmission of syphilis.

Another important aspect was the number of consultations and the start date of these follow-ups. The majority (47%) of the women had the minimum number of consultations stipulated by the Ministry of Health, which is six. Although,about 28% of the mothers started the follow-ups after the fourth month of pregnancy, harming the work of early intervention of maternal infections, with the possibility of transmission to the fetus. According to Domingues et al. (2008) in Rio de Janeiro, an association between disease transmission and late onset in prenatal consultations was observed, correlating similarly with the data obtained in this study. That said, it is evident that it is necessary to create new strategies for early capture of pregnant women for prenatal consultations, aiming at a more favorable outcome in relation to congenital syphilis infection. The quality of consultations needs to be improved, with early prenatal examinations, as well as the results as soon as possible, so as not to delay treatment and thus reduce the number of diseases transmitted from mother to child, including congenital syphilis. It is a marker of the development of a country because it is a preventable disease, through the use of condoms during sexual intercourse, cheap tests and treatment with penicillin, which is considered an essential drug for public health. Increases in the incidence and prevalence rates of this disease signal serious flaws in a country's public health system.

Regarding the birth conditions of the children analyzed, it was possible to observe that 5.3% had premature birth, 12.4% had microcephaly and 6.2% had low birth weight. According to Domingues et al. (2008) in Rio de Janeiro, 14.3% of prematurity and 20% of low birth weight were found, positively corroborating the data found in the research. Therefore, these characteristics must be investigated by health professionals in children who are contaminated or exposed to the risk of contamination, so that children with congenital syphilis are diagnosed and treated as early as possible, even in the maternity ward, at birth.

Regarding the treatment of the couple, it is possible to infer that although most mothers (74.3%) were treated properly, fathers remain untreated (33%) or are treated inappropriately (9.7%), which impairs in the epidemiological control of the disease. According to Costa et al. (2013), through a study carried out in Ceará, it was observed that 50% of the partners did not undergo adequate treatment to eradicate the bacteria, having a significant impact on the prevalence of congenital syphilis, which increased every year. Ministry of Health (2021), reports the importance of treating the partner even in the impossibility of carrying out a laboratory diagnosis, since the lack of treatment or inadequate treatment of the partner increases the chance of reinfection by the mother and,

consequently, the probability of the fetus contracting it. the illness.

Symptomatology is an important variable to be analyzed, since, in this study, almost half of the children had no symptoms and no changes in the physical examination. According to the Guidelines for the control of congenital syphilis of the Ministry of Health published in 2006, more than 50% of children with syphilis are born asymptomatic, requiring a detailed anamnesis about gestational syphilis and complementary exams to have a diagnosis of congenital syphilis and treat the disease. as early as possible to avoid the sequelae of the disease. In the present study, 36.3% had hepatomegaly greater than 3 cm at the first consultation, showing a degree of hepatic impairment that must be investigated in these individuals with altered physical examination. A case report from the United States by Aleem et al. (2022), showed that of the four children who were identified with congenital syphilis, one presented hepatomegaly, reinforcing the idea of the marked presence of this alteration in the physical examination, and therefore, it must always be sought by health professionals who accompany and deal with the diseases. infected children.

Regarding the treatment of children, 84.1% were treated with crystalline penicillin, being the most indicated treatment because it crosses the blood-brain barrier, also treating neurosyphilis. According to data from the 2020 epidemiological bulletin, positive VDRL was found in only 2.4% of children with syphilis showing underreporting of neurosyphilis.

Since 2019, the Ministry of Health has included in its protocol the obligation to carry out biochemical tests of liver function in order to assess the occurrence of syphilitic hepatitis in these children. In the present study, 26% of the patients were identified in the first consultation with anemia, 25% with reduced hematocrit, 2.7% with thrombocytopenia, 2.7% with leukopenia, 16.8% with an increase in Alkaline Phosphatase, 8% with hypoalbuminemia, 12.4% with hyponatremia, 39.8% with a decrease in total bilirubin, 46% with a decrease in indirect bilirubin, 2.7% with leukopenia, 5.3% with an increase in Gamma GT, 3.5% with an increase in TGO and 4.4% with an increase in TGP. A study carried out in Niterói by Souza et al. (2017), showed that 1.9% of patients had anemia and 13.4% had jaundice. With these results it is possible to infer the importance of laboratory monitoring of children affected by syphilis.

In the inferential statistics when comparing hepatomegaly with biochemical tests related to liver function, a positive association was found with a higher proportion of hepatomegaly > 3 cm and altered TGP. The other associations made between hemoglobin, hematocrit, platelets, sodium, potassium with hepatomegaly, mother treatment, prenatal consultations, prenatal care, gestational age, weight, height and head circumference were not found to be statistically significant. A case report by Pedrosa et al. (2003), showed a patient with the following results in laboratory tests: Total Bilirubin of 282.1 μmol/L, Direct Bilirubin of 251.3 μmol/, TGO of 914 U/L and TGP of 377 U/L, thus revealing liver involvement in the individual in question. That said, health professionals must pay attention to these possible laboratory findings, so that the patient has the best outcome and the least possible sequelae.

CONCLUSIONS

Treponema *pallidum* is an extremely deleterious bacterium, it causes inflammatory reactions in several organs through the hematogenous dissemination of the infected mother, untreated or inadequately treated with gestational syphilis, leading to

congenital syphilis. Among these organs, the liver is one of the most affected. In the literature review carried out in the present study, few studies address this topic. In this case, she was performed in a follow-up clinic for congenital syphilis and following the recommendations of the Ministry of Health protocol, she performed the measurement of these enzymes in the first follow-up consultation of these infants with congenital syphilis.

This study has limitations, such as not knowing the results of the exams of these postpartum women performed during prenatal care. These alterations found may be present in other congenital diseases as well as the result of the heel prick test that evaluates diseases that cause hepatic alterations. The follow-up of these children is also extremely important, evaluating their growth and development, in addition to repeating the altered exams and performing other complementary exams in those with suspected liver lesions.

More research is needed to assess the prevalence of congenital syphilitic hepatitis and the possible repercussions it may cause in children with congenital syphilis.

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