

## Research Article

# Prevalence of Congenital Syphilis in a Hospital in Bogotá in 2014 and 25 Years Before

Yolanda Cifuentes-Cifuentes<sup>1\*</sup> and Kelly José Muñoz-Ramírez<sup>2</sup><sup>1</sup>Department of Pediatrics, National University of Colombia, Colombia<sup>2</sup>San Ignacio University Hospital, Bogotá, Colombia**\*Corresponding author**

Yolanda Cifuentes Cifuentes, Department of Pediatrics, Division of Neonatology, National University of Colombia, Bogota DC, Colombia, Email: mycifuentesd@unal.edu.co

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**Keywords**

• Congenital syphilis, fetal mortality, neonatal mortality, neurosyphilis

**Abstract**

**Objectives:** The objective of this study is to compare the results of the syphilis screening program in force in 2014 with the results of the screening program at the time of delivery implemented 25 years ago at the Maternal and Child Institute (IMI) of Bogotá.

**Methodology:** Retrospective descriptive study, where the medical records of pregnant women with reactive VDRL at the time of delivery who were diagnosed with gestational syphilis were identified, with the subsequent review of the medical records of the corresponding newborns to evaluate the concordance of the diagnosis. Mother-child and manifestations in the newborn.

**Results:** During the first semester of 2014, the IMI received 2,141 births, 27 mothers had gestational syphilis and 18 of the newborns were cases of congenital syphilis: 2 stillborn and 16 alive, 100% of whom had some sign or symptom compatible with congenital syphilis. When compared with the results obtained in 1989, statistically significant differences were found in neonatal mortality due to CS, in the frequency of premature babies and in the evident manifestations in the physical examination showing a less severe disease; there were also differences in the VDRL titers of mothers and newborns when compared with the results obtained in 1989.

**Discussion and conclusions:** 25 years ago, at the IMI, a study was carried out on the behavior of gestational and congenital syphilis in our country, finding a prevalence of 0.719%.

**INTRODUCTION**

Syphilis is a worldwide public health problem [1]; infection in pregnant women can cause fetal infection that can result in preterm birth, growth restriction, asymptomatic newborns, systemic infection, hydrops, abortions, stillbirths and neonatal mortality [2,3].

The Global Burden of Diseases, Injuries, and Risk Factors (GBD) Study reported that congenital syphilis was among the top ten causes of DALYs (disability-adjusted life-years) in children under the age of 10 years in 2019 [4].

In 2016, the estimated global prevalence of GS was 4.73 cases per 1,000 births with a total of 661,000 cases of CS corresponding to 143,000 cases of abortions and stillbirths (21.6%) and 518,000 newborns with congenital syphilis (78.4 %) [5]. Estimated prevalence and incidence vary by region or country, with the highest prevalence and burden of maternal syphilis occurring in Africa, with more than 60% of new cases occurring in low- and middle-income countries [6].

In the United States for the year 2000 the incidence of syphilis in the general population was 2.1 x 100,000 inhabitants and for 2011-2013 it was 5.3 cases per 100,000 inhabitants; this increase occurred mainly in men between 20 and 29 years of age who

had sex with men [7]. For 2016, the CDC reports an incidence of 27.3 x 100,000 inhabitants with an increase to 40.8 x 100,000 inhabitants in 2020, with women being the second affected population [8].

In Canada, from 2010 to 2015, the incidence of syphilis increased from 5.0 to 9.3 cases per 100,000 inhabitants, more frequent in men, 17.5 cases per 100,000 men vs 1.2 per 100,000 women [9].

In Latin America, in the state of Sao Paulo in Brazil, where syphilis in the general population is mandatory to report, between 2011 and 2017, an increase of 26.0 to 84.6 x 100,000 inhabitants was reported and in pregnant women, an increase of 33.7 to 108.9 [10].

Since 2003, cases of gestational syphilis and congenital syphilis have been reported in Colombia; An increase has been reported between 2016 and 2022 in gestational syphilis, going from 6.2 cases per 1,000 live births (LB) + stillbirths to 16.8 x 1,000 LB + stillbirths, and for congenital syphilis from 1.2 to 2.6 cases per 1,000 LB + stillbirths [11].

Women with syphilis during pregnancy have a higher risk of stillbirth or low birth weight (OR 4.1, 95% CI: 2.4 to 7.2); With prenatal treatment, the outcome of pregnancy improves

significantly, even so the risk of an adverse outcome remains 2.5 times higher than that observed in uninfected pregnant women [12].

Adequate treatment in pregnant women includes administration of PNB according to the recommended regimen for the stage of infection administered 30 days or more before delivery, expected decrease in VDRL titer, and treatment of contact(s). In Colombia, according to the Clinical Practice Guideline [13], the treatment of pregnant women with early syphilis (less than or equal to 1 year of infection) is 2,400,000 IU of PNB IM in a single dose; for late syphilis (latent syphilis lasting more than 1 year since infection) and for syphilis of unknown duration, 2,400,000 IU of PNB IM weekly dose for 3 weeks; The criteria to consider a case of CS include a live or dead newborn born to a mother with gestational syphilis without treatment or with inadequate treatment to prevent congenital syphilis OR all newborns with a non-treponemal test (VDRL, RPR) with titers four times higher than the titers of the mother at the time of delivery OR all newborns born to pregnant women with a diagnosis of syphilis in the current pregnancy, with one or more manifestations suggestive of congenital syphilis on physical examination or with suggestive paraclinical tests of congenital syphilis OR All fruit of pregnancy with demonstration of *Treponema pallidum* by some specific procedure. The treatment of the case of SC should be done with IV Crystalline Penicillin for ten days [13]. with one or several manifestations suggestive of congenital syphilis on physical examination or with paraclinical tests suggestive of congenital syphilis OR All fruit of pregnancy with demonstration of *Treponema pallidum* by some specific procedure. The treatment of the case of SC should be done with IV Crystalline Penicillin for ten days [13]. with one or several manifestations suggestive of congenital syphilis on physical examination or with paraclinical tests suggestive of congenital syphilis OR All fruit of pregnancy with demonstration of *Treponema pallidum* by some specific procedure. The treatment of the case of SC should be done with IV Crystalline Penicillin for ten days [13].

The present work describes the epidemiological behavior of gestational and congenital syphilis in the population treated at Hospital La Victoria, headquarters of the Maternal and Child Institute, during the first semester of 2014, comparing it with the results obtained 25 years ago and reviews the impact that on the Institution have had public health policies implemented in recent years regarding the prevention, diagnosis and management of this pathology in populations at risk.

## METHODOLOGY

This is a retrospective descriptive study, developed at La Victoria Hospital, headquarters of the Maternal and Child Institute, a third-level center where pregnant women and their newborns are cared for. All births occurring from January 1, 2014 to June 30 of the same year were included; The medical records of pregnant women with reactive VDRL at the time of delivery were identified, ruling out false positive cases. In cases with a confirmed diagnosis of gestational syphilis, it was evaluated whether the patient received appropriate and timely pharmacological management and whether it was successful. Subsequently, the records of the corresponding newborns were

reviewed to evaluate the Mother-Child concordance regarding the diagnosis of Syphilis, the manifestations presented by the newborn and the VDRL values found;

## Inclusion criteria

Pregnant women attended at the time of delivery at the Maternal and Child Institute during the first semester (January 1 to June 30) of 2014, with a reactive VDRL result and a positive treponemal test, and their corresponding newborns.

## Exclusion criteria

Pregnant women with a reactive non-treponemal test and a negative treponemal test or with an incomplete or unavailable clinical history.

The information processing was done with the statistical processor Programming and Data Management (SPSS) version 15.0 for Windows. The percentage was used as a summary measure to present the results of the variables used. To determine the correlation between the variables, the Chi-square test was used and a value of  $P < 0.05$  was considered as the level of statistical significance. The presentation of the information was done through tables.

## RESULTS

During the study period between January 1 and June 30, 2014, 2,141 births were received, corresponding to 2,135 live newborns and 6 stillbirths; In 1989, 1,668 births were attended, corresponding to 1,610 live births and 58 stillbirths, the difference in fetal mortality in the two populations attended is very significant ( $P$  less than 0.0001).

In 2014, a record was found of 42 pregnant women with reactive VDRL at the time of delivery, of which 4 were excluded due to non-availability of medical records and 11 that corresponded to false positives due to having a negative treponemal test (FTA-Abs). The remaining 27 patients were classified as confirmed cases of gestational syphilis. When reviewing the records corresponding to pregnant women with confirmed cases of gestational syphilis and those of their newborns, it was found that 12 pregnant women with a diagnosis of a confirmed case of gestational syphilis received adequate treatment during pregnancy, considering successful treatment to prevent CS in 9 patients.

During the study period, a report was found of 4 patients who had an abortion between week 6 and week 9 of gestation, with reactive VDRL at the time of admission to the hospital, 2 of whom met the criteria for the diagnosis of gestational syphilis without treatment at the time of loss.

Of the 18 cases that met the criteria to be considered cases of congenital syphilis, 2 were stillbirths and 16 corresponded to live newborns with a frequency of the disease of 1 for every 133 live births and 1 for every 3 stillbirths; In 1989, 12 cases were found, of which 5 were stillbirths and 7 were live births, with a disease frequency of 1 per 230 live births and 1 per 12 stillbirths (27); these differences are not statistically significant ( $P$  0.0837). The characteristics of live newborns with CS are shown in Tables 1 and 2.

**Table 1:** Characteristics of CS cases, 2014.

C#	Weight(g)	EG	Weight/GA	Sex	NOC	Findings	VDRL RN	VDRL CSF	VDRL stem	mother treatment
1	2900	39	Appropriate	M	two	Elevated transaminases. proteinuria	1:8	NR	1:64	without treatment
2	2850	37	Appropriate	M	1	Elevated transaminases. proteinuria	1:1	NR	1:4	without treatment
3	3150	38	Appropriate	M	8	Elevated transaminases. proteinuria	1:2	NR	1:4	without treatment
4	2980	38	Appropriate	M	0	Proteinorrhachia	1:2	NR	1:2	without treatment
5	2380	36	Appropriate	M	1	Prematurity	1:32	NR	1:32	without treatment
6	2250	39	Bass	F	0	IUGR	1:16	-	1:32	without treatment
7	2100	38	Bass	M	0	IUGR	1:1	-	1:4	without treatment
8	1700	36	Bass	M	0	Prematurity, IUGR, elevated transaminases	1:8	NR	1:32	without treatment
9	2890	38	Appropriate	F	7	Pleocytosis	1:8	NR	1:16	Inadequate
10	3100	38	Appropriate	F	3	elevated transaminases. proteinuria	1:1	NR	1:0	Inadequate
11	2950	40	Appropriate	M	5	Proteinorrhachia	NR	NR	1:0	Inadequate
12	2400	38	Bass	M	4	IUGR	NR	NR	1:0	Inadequate
13	3000	40	Appropriate	M	6	Proteinorrhachia	1:4	NR	1:8	Inadequate
14	3900	40	Appropriate	M	3	elevated transaminases	1:0	-	1:0	Failure
15	3100	40	Appropriate	M	7	elevated transaminases. proteinuria	1:0	NR	1:2	Failure
16	2250	37	Bass	F	3	elevated transaminases. Proteinuria, hematuria.IUGR	1:4	NR	1:8	Failure

**Table 2:** Characteristics of CS cases, 1989.

Case	Weight	EG	WeightxEG	NOC	Manifestations and complications	VDRL RN	VDRL CSF	VDRL stem	pass away	Diagnosis in childbirth
1	2200	36	AEG	No	none	1:512	not r	1:64	No	Yes
2	820	30	IUGR	No	Palmoplantar desquamation, hepatosplenomegaly, RDS, pneumothorax	1:16	?	1:256	Yes	Yes
3	2600	40	IUGR	?	none	1:128	1:2	1:32	No	Yes
4	1140	32	IUGR	No	hepatosplenomegaly, periostitis, gastrointestinal bleeding	1:512	1:2	1:32	Yes	Yes
5	1550	32	AEG	No	Splenomegalia, severe jaundice, bacterial meningitis	1:128	1:1	1:64		Yes
6	3330	40	AEG	?	none	1:64	1:2	1:16	No	Yes
7	1320	32	AEG	Yes	Palmoplantar pemphigus, ascites, hepatosplenomegaly, pneumonia alba, asphyxia, shock	?	?	1:8	Yes	Yes

Of the 16 cases of live newborns with CS, 50% of pregnant women with SG (8 pregnant women) did not receive treatment, of the rest (9 pregnant women), 6 received inadequate treatment and 3 cases were considered treatment failure to prevent CS due to no evidence of a decrease in VDRL titers, absence of treatment for the partner and findings compatible with CS in the newborns.

Of the 16 cases of live births, none died, which contrasts with

the mortality of the cases of the 1989 study in which 4 of the 7 live births with CS died, this difference is statistically significant (P 0.0040).

Regarding the characteristics of NBs with CS, in 2014 of the 16 cases of CS, 2 were preterm (<37 weeks) and 5 had IUGR, in 1989, of 7 cases, 5 were preterm and 3 had IUGR, the difference in the frequency of prematurity is statistically significant (P

0.0107), the difference in the frequency of intrauterine growth restriction is not significant ( $p=0.6570$ ).

In 2014, none presented the clinical manifestations evident in the physical examination or bone alterations described in the 1989 cases, 50% (8 cases) had liver involvement, 37.5% (6 cases) had kidney involvement and 25% (4 cases) had CSF cytochemical abnormalities but none had reactive CSF VDRL; When comparing these results with those found in 1989, a similarity is observed in the tendency to liver involvement.

In the 2014 study none of 13 cases of CS newborns who underwent lumbar puncture had reactive CSF VDRL, in 1989, 4 patients out of 5 had reactive CSF VDRL, this difference is statistically significant ( $P=0.0016$ ).

From the point of view of the serological test titers comparing those of the newborn with those of the mother, in 2014 in 3 cases the VDRL of the newborn was equal to or  $>$  the VDRL of the mother, in 1989 in 5 of 6 VDRL of the newborn was equal to or  $>$  the mother's VDRL, this difference is statistically significant ( $P=0.0109$ ).

In 2014, 7 pregnant women had VDRL  $\geq 8$  dilutions, in 1989 the 7 pregnant women had VDRL titers  $\geq 8$  dilutions, this difference is statistically significant ( $P=0.0074$ ).

In pregnant women who had stillbirths, when comparing VDRL titers in 2014, 1 pregnant woman had VDRL  $\geq 8$  dil and in 1989 all had titers  $\geq 8$  dil, this difference is not statistically significant ( $P=0.2857$ ); In the stillbirths that occurred in 2014 (2 cases), it was documented that they correspond to preterm pregnancies equal to what happened in 1989, but it is noteworthy that the pregnant women had attended one and two prenatal check-ups, respectively.

Taken and modified from: 14. Cifuentes CY, Currea GS, Espinel PA, Gutiérrez P MC, Lonngi RG, Muñoz RL, Ulloque G H. Syphilis – Prevalence in 1668 births. PEDIATRICS Volume 24 No. 1 1989 pages 46-49

## DISCUSSION

In the Hospital where the 2 studies were carried out between 1989 and 2014, there has been a significant decrease in fetal mortality but fetal mortality caused by congenital syphilis persists and in 2014 abortions caused by CS are reported according to several studies [14,15]; fetal mortality due to syphilis persists worldwide as reported in a review in which it is estimated that in 2015 there were 2.6 million stillbirths, of which about 1.3 million of them could be prevented by antenatal care and highlights that although the determination of the origin of these deaths is not known with certainty due to the lack of records, for 18 countries with reliable data, congenital anomalies represent only 7.4% of fetal deaths, while maternal infections such as malaria and syphilis contribute in 8,

The cases of congenital syphilis in 2014 compared to 1989 show significant differences: absence of neonatal mortality due to CS, fewer premature babies and important changes in the clinical presentation of the disease with the absence of cases with manifestations detected on physical examination and a decrease in Serological titers of mothers and newborns with absence of

VDRL reactivity in the CSF making the diagnosis of neurosyphilis difficult [16,17] since the findings in the CSF correspond to aseptic meningitis that can be caused by another agent [18,19]; furthermore, TPHA and FTA Abs are not routinely performed on CSF, which seem to have a higher sensitivity than VDRL [18,20].

The lower severity of the cases in the series in 2014 when compared to that of 1989 may be related to the decrease in the number of premature infants. The difference in the severity of systemic involvement in premature infants has previously been reported when contrasted with the involvement in term newborns [21].

This change in CS clinical features makes it necessary to demonstrate organ involvement by means of laboratory tests, as had been reported in a previous study [22], and despite the increase in the number of cases, it suggests a decrease in the pathogenicity of the treponema but retaining the ability to produce fetal mortality.

The surveillance program for gestational and congenital syphilis in our country is relatively recent, finding that this pathology was included within the mandatory notification events since 2003, prior to which no national records were found.

With the establishment of the active surveillance program for syphilis during pregnancy, it would be expected to find a reduction in congenital disease, and with this meet the objective of reducing its frequency to 0.5 cases or less per 1000 live births. In our study we found a prevalence of 0.841% in the population studied, with no statistically significant difference compared to that calculated 25 years ago, a fact that is reinforced by the National Institute of Health, which has reported an increase between the years 2016 and 2022. In congenital syphilis from 1.2 to 2.6 cases per 1,000 live births + stillbirths [11], a figure still far from the goal set in the millennium goals.

It should be noted as an encouraging finding, the evidence of a treatment success rate of 33%, which, although it is still below the projected goals, has changed when compared with the results obtained in 1989, a time in which no neither diagnosis nor treatment for syphilis was performed during pregnancy because the diagnosis was made at the time of delivery.

This success rate in management could be better, the low number that is still observed is directly related to the quality of health promotion and disease prevention programs carried out in the country, as well as the effectiveness of the same in the early capture of all pregnant women, the early diagnosis of the pathology and its correct treatment, including within this the concomitant treatment of the partner in order to reduce reinfections. At this point we can conclude that in Colombia, despite the implementation several years ago of structured plans for the active search, detection and early treatment of gestational syphilis and prevention of congenital syphilis, these two pathologies continue to be public health problems. That is why it is necessary to optimize the programs that are in force, in order to improve both the success rate in the treatment of pregnant women with preconception disease, as well as the number of women infected during pregnancy and newborns. Compromised by congenital pathology. Likewise, general health education in terms of primary prevention of the disease in the

entire population, including men and not only pregnant women, and the adequate training of medical personnel on the course, diagnosis and management of the same, become fundamental pillars.

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