

ORIGINAL ARTICLE

Characterization of congenital syphilis cases with emphasis on the therapeutic scheme in a philanthropic maternity hospital in Espírito Santo

Renata Pereira Ferro¹, Laylla Ribeiro Macedo², Mariana Ribeiro Macedo³, Ionar Cilene de Oliveira Cosson⁴, Jaçamar Aldenora dos Santos⁵, Julia Santos Carvalho⁶, Cristina Ribeiro Macedo⁷



¹<https://orcid.org/0000-0001-9008-3396>

²<https://orcid.org/0000-0002-6246-3559>

³<https://orcid.org/0000-0001-9467-1734>

⁴<https://orcid.org/0000-0001-8002-1861>

⁵<https://orcid.org/0000-0002-1405-4849>

⁶<https://orcid.org/000-0003-3259-6585>

⁷<https://orcid.org/0000-0002-1607-2928>

Corresponding author
cristinarmacedo@gmail.com

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Abstract

Introduction: Syphilis is still a worldwide problem; with approximately 12 million people infected every year. Over the last decade, Brazil had an increment in the number of cases. The year 2016 reported 37,436 cases of syphilis in pregnant women and 20,474 cases of congenital syphilis, with 185 deaths. The Southeast region reached the highest numbers, especially in the state of Espírito Santo with high rates in pregnant women, being the third highest incidence rate in the country with 10.4 cases/1,000 live births, above the national average of 6.8 cases/1,000 live births.

Objective: Describe the therapeutic treatment of children affected with congenital syphilis as well as the clinical, radiological and laboratory changes associated to this disease.

Methods: Retrospective, descriptive, exploratory, quantitative study, based on 204 notification forms of congenital syphilis from January 2016 to December 2017.

Results: The findings showed that 88.7% of the puerperal women performed prenatal care. Regarding newborns, 85.3% were asymptomatic. When analyzing the therapeutic regimen instituted, 22.5% used procaine Penicillin G, 22.5% crystalline Penicillin G and 20.6% benzathine Penicillin G.

Conclusion: The treatment instituted by this philanthropic maternity for newborns with congenital syphilis is in line with the guidelines proposed by the Ministry of Health. The clinical symptoms do not represent a frequent finding during the neonatal period, however, they can occur later.

Keywords: congenital syphilis, prenatal care, compulsory notification.

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Authors summary

Why was this study done?

The motivation for carrying out the study was due to the observation of the authors of the high incidence of congenital syphilis in Brazil, and the state of Espírito Santo, it was verified by the Department of Health that the state has the second highest incidence rate of syphilis acquired in the scenario national level, with 85.2 cases for every 100,000 inhabitants. Knowing about the shortage in the country in the period from 2016 to 2017 of antibiotics whose component is penicillin, the authors sought to identify such occurrence directly impacted on the treatment of newborns with congenital syphilis in a reference philanthropic maternity hospital. The investigation of the symptoms found is based on the researchers' hypothesis given the fact that frailty may have contributed to the presence of symptoms in the newborn with congenital syphilis, which are usually rare.

What did the researchers do and find?

The researchers, using the forms of compulsory notification of congenital syphilis of newborns in a philanthropic maternity hospital in the metropolitan region of Vitória, investigated the treatment scheme established and the presence of symptoms in these patients. The researchers obtained as a result that the treatment instituted for newborns, followed the guidelines of the Clinical Protocol in the treatment of congenital syphilis, so the shortage of the drug did not impact the study maternity.

Regarding the symptoms presented, it was possible to observe 85.3% of newborns were asymptomatic, 11.3% asymptomatic, 2% ignored, 1.5% answered that the clinical diagnosis is not applicable, corroborating with the current literature.

One difficulty found by the researchers was the incompleteness of the data, many cases of the notification form not filled in were observed

What do these findings mean?

The findings mean that the shortage of penicillin did not impact the treatment of congenital syphilis, and that the serious problem of syphilis is related to other factors that deserve more attention.

It is known that the health professional has the responsibility to notify illness diseases and to spread health promotion and prevention actions in an expanded way in order to offer efficient humanized care, the precariousness of the data showed that there is a need for greater awareness regarding the importance of properly filling out the notification forms for science and the institution of public health policies.

INTRODUCTION

The rate of vertical transmission of intrauterine syphilis is up 80% and occurs when the fetus passes through the birth canal. The stage of the disease in the mother and the period of fetal exposure directly influence the likelihood of infection. Thus, in case of primary or secondary syphilis during pregnancy, the chance of Trans placental transmission is higher. There are more than 300,000 fetal and neonatal deaths worldwide and 215,000 children at increased risk of premature death from congenital syphilis¹⁻³.

The occurrence of congenital syphilis is a subject of discussion in developed countries, as the approach brought by Cooper *et al.*⁴, regarding the increase in the number of cases in the United States, who state that its occurrence must be seen as a failure of health services⁵⁻⁷.

Syphilis is a worldwide problem; with approximately 12 million people infected every year. Over the past decade, Brazil had a significant increment; in 2016, the country reported 37,436 cases of syphilis in pregnant women and 20,474 of congenital syphilis, with 185 deaths. The Southeast region reported the highest number of infected people, especially in the State of Espírito Santo with high syphilis rates in pregnant women, being the third highest incidence rate in the country with 10.4 cases/1,000 live births, above the national average of 6.8 cases/1,000 live births^{8,9}.

Brazil has shown an increase in the reporting of syphilis cases in pregnant women due to the improvement of the epidemiological surveillance system and the expansion of the rapid test distribution, in addition to the creation in 2011 of the health policy "Rede Cegonha" which increased access to the diagnosis of syphilis in pregnant women throughout the country. On July 14, 2005, compulsory notification of gestational syphilis was instituted nationwide³.

As a measure to mitigate the increased incidence of congenital syphilis and to reorganize health interventions, the Ministry of Health launched the State Plan for Confronting Congenital Syphilis. It proposed, among other actions, man's prenatal care, ensuring the application of Penicillin G benzathine in all primary care units, ensuring that all pregnant women carry out rapid tests in the first prenatal consultation and in the third trimester of pregnancy¹⁰⁻¹³.

Under these circumstances, it is important to study not only the consequences related to the disease but also the importance of reviewing and analyzing the factors that influence its increased incidence in Brazil.

Researchers adopted as a study hypothesis that Brazil in 2015 had a shortage of drugs benzathine, procaine and crystalline penicillin prescribed for the treatment of syphilis according the protocols of Pharmaceutical Assistance of National Health System (SUS- Sistema Unico de Saúde). This corroborated with the increase in cases of congenital syphilis hence the treatment of newborn could not be occurring in consonance with the national protocol of treatment, which would result in complications to the newborn¹.

Considering the above factors, this study aims to describe the therapeutic treatment of children affected with congenital syphilis as well as the clinical, radiological and laboratory changes associated to this disease.

METHODS

Study design and location

This is cross-sectional, retrospective, descriptive and exploratory study with a quantitative approach, carried out in a philanthropic maternity hospital in the metropolitan region of Vitória, Espírito Santo, Brazil.

Population

The sample is comprised of 204 puerperal women diagnosed with syphilis and their children born from January 2016 to December 2017.

All records of reports of congenital syphilis during the study period mentioned above were assessed to identify variables related to the newborns and their mothers.

Ethics, Study period and Data

The Research Committee of CEP EMESCAM under opinion number 2,403,955 approved the study. Data were collected on March 2018 from two main sources: the notification forms used in the Municipal Health Secretariat (SEMUS) and the medical records.

Study variables

The variables related to the mother were as follows: age, race, education, occupation, and prenatal care, diagnosis of maternal syphilis, non-treponemal test in childbirth/curettage, treatment schedule and the medication of her partner.

Regarding data related to newborns, the dependent variables were as follows: Nontreponemal test at birth and at discharge, test on the liquor, clinical diagnosis of comorbidities, presence of signs and symptoms, treatment schedule, long bone x-ray and evolution of the case (discharge, death, and transfer), variables related to clinical and radiological changes linked to congenital syphilis.

The notification forms from the maternity hospital were the source of the data related to conditions and practices of treatment of congenital syphilis. Those notification forms that had another indication of therapy for the newborn were excluded.

Data analysis

Data analysis, percentage calculations, mean and standard deviation were examined, using the statistical software SPSS version 23, licensed by EMESCAM, and then the data were described and illustrated in tables and figures.

RESULTS

The standard deviation of the puerperal women was 5.0, with a minimum age of 15, an average of 23 and a maximum of 40 years. Regarding ethnicity 90.7% were brown, 2.0% white, 3.9% black and 2.9% answered, "Ignored". Related to the mother's occupation, 52.9% perform household activities, 27.9% work outside the home, 19.1% of the information was ignored/not answered.

Regarding the educational level, 18.6% completed high school, 15.7% had incomplete high school, 15.7% completed elementary school, 12.3% had incomplete 5th to 8th grade of elementary school, 2.5% were illiterate and only 1% had incomplete higher education. Related to prenatal care of puerperal women, 88.7% reported that they performed it, 7.4% did not and 3.9% answered ignored, as is illustrated in table 1.

Table 1: Frequency of prenatal care for women attended at a philanthropic maternity hospital from January 2016 to December 2017. Vitoria-ES.

| Prenatal care | Frequency | Percentage |
|---------------|-----------|------------|
| Ignored | 8 | 3.9 |
| No | 15 | 7.4 |
| Yes | 181 | 88.7 |
| Total | 204 | 100.0 |

Source: Compulsory notification forms for congenital syphilis.

Table 2 shows the relationship between the number and percentage of cases diagnosed with maternal syphilis.

Table 2: Moment of making the diagnosis of maternal syphilis in women seen at a philanthropic maternity hospital from January 2016 to December 2017. Vitoria-ES.

| Diagnosis of maternal syphilis | Frequency | Porcentagem |
|--------------------------------|-----------|-------------|
| After delivery | 1 | .5 |
| During prenatal care | 150 | 73.5 |
| Ignored | 10 | 4.9 |
| At delivery / curettage | 43 | 21.1 |
| Total | 204 | 100.0 |

Source: Compulsory notification forms for congenital syphilis

When analyzing the diagnosis of maternal syphilis, 73.5% evidenced it during prenatal care, 21.1% at the time of delivery/curettage and 4.9% showed this item ignored/unfilled information.

Regarding the Nontreponemal test at delivery/curettage, 90.2% indicated a reactive result, 8.3% non-reactive and 1.5% did not perform the test.

With reference to the treatment regimens, 41.2% was inadequate, 36.3% was not performed and 12.3% of the records did not have this information. Only 10.3% received adequate treatment.

Variables related to the newborns

Considering the accomplishment of the treponemal confirmatory test at delivery/curettage, 49.5% of the newborns did not undergo, 45.1% was reactive and 5.4% no reactive. However, in the treponemal test after 18 months, 61.1% of the answers were marked as "not applicable", 31.1% ignored, 4.4% not performed and 2.5 non- reactive.

With respect to the Nontreponemal on the liquor, 81.9% showed a non-reactive result, 16.7% ignored and 1.5% reagent. In reference to the evidence of *Treponema pallidum*, 66.2% not observed, 25.0% ignored, 8.8% not obtain. Jaundice was the most common symptom found among the newborns, as shown in table 3.

Table 3: Signs and symptoms presented by newborns seen at a philanthropic maternity hospital from January 2016 to December 2017. Vitoria-ES.

| Signs or symptoms | Nº pacient | Percentage (n = 204) |
|-------------------|------------|----------------------|
| Jaundice | 42 | 20,59 |
| Skin lesions | 2 | 0,98 |
| Other | 2 | 0,98 |

Source: Compulsory notification forms for congenital syphilis

When analyzing the liquor alteration in newborns, it was found that 72.5% had no alteration, 12.7% did not perform the test, 8.8% had alteration and 5.9% ignored.

Regarding the Radiological diagnosis of newborns about the changes found in the examination of long bones, as recommended by the protocol of clinical practices of the Ministry of Health, 70.6% had no changes, 14.7% did not have the test, 14.2% ignored and 0.5% had changes.

As for the clinical diagnosis of the newborns, 85.2% were asymptomatic, 11.3% symptomatic, 2% ignored, 1.5% answered that the clinical diagnosis is not applicable.

Table 4: Treatment received by newborns at a philanthropic maternity hospital from January 2016 to December 2017. Vitoria, Espírito Santo, Brazil.

| Treatment | Frequency | Percentage |
|---|-----------|------------|
| Ignored | 6 | 2,9 |
| Unrealized | 12 | 5,9 |
| Another scheme | 56 | 27,5 |
| Benzathine Penicillin G 50,000 IU / Kg / Day | 42 | 20,6 |
| Crystalline Penicillin G 100,000 to 150,000 IU / Kg / Day - 10 days | 42 | 20,6 |
| Penicillin G procaine 50,000 IU / Kg / Day - 10 days | 46 | 22,5 |
| Total | 204 | 100,0 |

Source: Compulsory notification forms for congenital syphilis

Regarding the treatment received by the newborns, 22.5% used Penicillin G procaine 50.000 IU/Kg/Day for 10 days, 20.6% used crystalline Penicillin G 100,000 to 150.000 IU/Kg/Day for 10 days, 20.6% used Benzathine Penicillin G 50.000 IU/Kg/Day, 5.9% did not undergo treatment, 2.9% responded ignored and 27.7% underwent treatment with another medication.

Among the 56 answers marked as other treatments, 87.5% reported the use of ceftriaxone and 2.5% did not mention the drug prescribed.

Regarding the clinical condition 97.1% remained alive, 1.5% stillborn, 1.0% abortion and 0.5% evolved to death due to congenital syphilis.

DISCUSSION

The present study points out as a limiting factor the incompleteness of the data contained in the records of reports of congenital syphilis, observing in the large number of empty cells or marked as ignored. Such findings were also found in a study by Saraceni *et al.*¹⁴ collaborators based on data from the National Information System for Notifiable Diseases (SINAN) between the years 1999 and 2000, in relation to the variable ethnicity of the newborn identified, that 100% of the cells were not filled. In the present study, only 7.8% (n = 204) were not properly filled out. It is observed that both studies show the same similarity regarding the absence or incomplete filling of the cells.

In addition, another study demonstrates that the impoverishment of the information contained in the congenital syphilis notification form, a fact also mentioned in the study by Boni and Pagliari⁷, by emphasizing that for lack of reliable information, they were also found in the syphilis notification forms. For maternal treatment after positive tests with the same characteristics regarding filling, several cells were filled in as ignored or blank⁷.

In regards to the profile of pregnant women reported as positive for syphilis, the average age was 23 years compatible with the study by Soares *et al.*¹⁴ where 75% of them was between 20 and 34 years.

It is noteworthy that these women are in reproductive age, with vulnerability related to motherhood, as evidenced in a study based on the Sistema de Informação Sobre Mortalidade (SIM); the authors associated this change in behavior with a factor for illness. Because, not all autonomy in relation to the experience of female sexuality, come with promotion and prevention measures to ensure their self-care¹⁵.

For Domingues and Leal⁹ in their study carried out in 2016, when a notification is not given in its entirety when filling in the gaps in the cells, it resulted in 25.6% of cases of gestational syphilis not being treated which resulted in deaths early or late. And yet, he warns, that 3% of the cases resulted in deaths caused by congenital syphilis in the condition of stillbirth and / or abortion. These same researchers had already raised this notification problem, evidenced in another study used for comparison carried out in 2013¹⁶.

Thus, it is pertinent to adopt more efficient public health policies aimed to improve the handling of notification of pregnant women diagnosed with syphilis, which may contribute to coping with the congenital syphilis epidemic experienced in Brazil. This will be only possible through adequate monitoring and a more effective decision-making by the responsible health teams, bearing in mind that the number of congenital syphilis diagnoses is due to failure of notifying its early diagnosis and treatment¹.

Considering, that congenital syphilis, regardless of the economic situation of the country or the women affected, will be always a serious public health problem, evidenced in the study developed by the Centers for Disease Control and Prevention (CDC). They investigated and registering 6383 cases in 50 American states and Washington DC reporting a mortality rate of 11.6 per

1000 live births from 1999 to 2013, contrasting the goal of World Health Organization (WHO) of eliminating vertical transmission of congenital syphilis⁵.

It was observed a gradient of infection by syphilis and congenital syphilis according to maternal education: the lower the woman's education, the greater the occurrence of syphilis infection and congenital syphilis as follows: 60.6% had incomplete elementary education, 15.3% of postpartum women had schooling between illiteracy and incomplete elementary education⁹. Low maternal education may contribute to a lack of understanding of information and hinders the adoption of safer habits through prevention measures for maternal health¹⁵.

In our study 2.9% of the notified cases, did not have information about the treatment adopted, which makes it difficult to measure rapidly the real situation, contributing to the illness of the population, even though the Ministry of Health has a Guideline for the Control of Congenital Syphilis that states that every child diagnosed or with suspected congenital syphilis must receive appropriate treatment also to treat neurosyphilis¹⁶. The above finding reinforces the idea regarding the incompleteness of the data in filling out the notification form, which makes it difficult to measure the real health situation soon, contributing to the population's illness.

According to the research by Cooper *et al.*⁵, the eradication of syphilis transmission between mother and fetus depends on the assistance of health services during prenatal care. The consequences of late diagnosis and inadequate treatment of infected newborns can follow severe complications, which affect the central nervous system, bones, joints and teeth¹⁷. Hence, is imperative the adoption of measures to implement the treatment of congenital syphilis to the newborn, following the guidelines of the Ministry of Health, which were adopted by the maternity where this study was performed, to reduce the damage to a generation exposed to infection with affordable and feasible treatment.

According to the protocol for the prevention of vertical transmission of HIV and Syphilis of the Ministry of Health published in 2007, prenatal care has high coverage in Brazil, a fact found in our study, where 88.7 % of congenital syphilis notifications showed the performance of prenatal care. A research by Cavalcante *et al.*¹⁸ reported that 81.4% of the women received prenatal care during pregnancy¹⁷. Therefore, if prenatal coverage is adequate, and the incidence of maternal syphilis and congenital syphilis remains high, it is necessary to expand the discussion to the different levels of health care to seek answers and add efforts to control the problem¹⁸.

The quality of care provided to pregnant women is below expected to meet the needs of prevention and treatment. Although the National Policy for Obstetric and Neonatal Care provides for routine examinations related to syphilis, the Ministry of Health found that the recommended routine and appropriate treatment are sometimes not observed¹⁸.

The protocol of Ministry of Health regarding the proper treatment of pregnant woman and her partner is very systematic during the prenatal period and after the

diagnosis of syphilis, therefore, it is possible to eradicate congenital syphilis as a public health problem. In relation to the current prenatal and puerperium manual, testing for syphilis and HIV in the preconception assessment is a matter for conducting and investigating whenever possible¹⁹. Considering the number of newborns from January 2016 to December 2017 (204) that met the inclusion criteria of this study it is evident a failure in the diagnosis and treatment of pregnant women with syphilis.

Analyzing our results and according to Guinsburg and Santos¹⁹, even with the knowledge of prevention and treatment measures to decrease the incidence of congenital syphilis or even eliminate it, the cases of this disease continue to increase²⁰.

Azevedo *et al.*²¹, reinforces that the eradication of transmission risks of syphilis to the fetus, it will depend on performing the treatment of the pregnant woman and her partner correctly, with the prescription of benzathine penicillin in up to three doses depending on the stage of the disease.

For Guanabara *et al.*²², the failure to implement the treatment of the sexual partner hinders the adequate treatment of the pregnant woman, this study brings reports from health professionals who claim that the partners do not attend prenatal consultations due to the absence of signs and symptoms, which is why they do not identify themselves with the problem².

It should be emphasized that socio-cultural processes interfere with the subject's attention in the health context, affecting even the design of public policies. Sensitizing the individuals and mobilizing them for their care requires an efficient communication channel, therefore, the accomplishment of pre-natal care, does not guarantee the effectiveness of it²³⁻²⁶.

The syphilis epidemiological bulletin published in 2017, updated the definition for confirmation of congenital syphilis cases, disregarding the treatment of the woman's partner as a diagnostic criterion²⁷. According the bulletin the compliance of at least one dose of benzathine penicillin is much higher at national level than the result obtained in our study. However, there is an inversion of values respect to other type of treatments; our results provide more detailed data than the epidemiological bulletin from Health Ministry in relation to the information ignored by the users^{27,28}.

The National Guidelines for Comprehensive Care of People with Sexually Transmitted Infections published in 2015 by the Ministry of Health states that exists a complexity in the diagnosis of the child since more than half are asymptomatic at birth. In those cases with signs and symptoms, they are discrete and not very specific; therefore, the treatment of the newborns is based on their serological exams and on their gestational and epidemiological history²⁸.

In this context, 75.5% of the responses revealed that the newborns did not show signs and symptoms, 4% answered as it does not apply/ignored, and 20% had signs and symptoms. The table 3 illustrates that 42 patients suffered jaundice, two with skin lesions and two had other symptoms.

Although the appearance of symptoms in the neonatal period does not represent a frequent finding, it is known that its late appearance may occur. In this sense, the need for early treatment in intrauterine life was evidenced by a literature review that identified the non-occurrence of syphilitic sensorineural hearing loss (SNHL) after intrauterine treatment of syphilis. The study emphasizes the importance of carrying out hearing screening for all pediatric patients with congenital syphilis, as well as the relevance of providing the proper treatment to newborns^{28,29}.

Considering that the reality of the institution in question has an average of 400 live births per month, and with regard to the data found in this research, it was identified that 21.25 cases of live births at home 1000 have congenital syphilis in the research institution. According to the millennium goal, which calls for the reduction of 1 case for every 1000 live births, it can be concluded that there is still a long way to go to reach the goal of reducing it to the ideal²⁹.

The present study points out as a limiting factor the incompleteness of the data contained in the records of notifications of congenital syphilis, indicated by the large number of empty cells or answers marked as ignored. Another limitation was the difficulty in calculating the mortality rate due to the failure to perform the treponemal confirmatory test at delivery/curettage in 49.5% of cases, which may have resulted in an underestimation of the data.

CONCLUSION

The treatment for newborns with congenital syphilis instituted by this philanthropic maternity is in line with the guidelines proposed by the Ministry of Health. The clinical symptoms do not represent a frequent finding during the neonatal period, however, they can appear later.

Considering the magnitude of the problem, it is extremely important to face it with proper strategies. It is known that the health professional has the responsibility to notify diseases. They must spread health promotion and prevention actions in an expanded way to offer humanized care efficiently aiming the involvement of the community and health services that will make it possible to eliminate congenital syphilis as a public health problem.

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Resumo

Introdução: A sífilis ainda é um problema mundial, calcula-se que todos os anos aproximadamente 12 milhões de pessoas são infectadas. Na última década, no Brasil foi registrado um aumento dos casos, apenas no ano de 2016, foram notificados 37.436 casos de sífilis em gestantes e 20.474 casos de sífilis congênita, sendo 185 óbitos, os maiores números de casos foram notificados na região Sudeste, especialmente no estado do Espírito Santo com elevadas taxas de sífilis em gestantes, estando em terceiro lugar de maior taxa de incidência no país com 10,4 casos/1.000 nascidos vivos, acima da média nacional de 6,8 casos/1.000 nascidos vivos.

Objetivo: Descrever o tratamento terapêutico de crianças afetadas com sífilis congênita, bem como as alterações clínicas, radiológicas e laboratoriais associadas a esta doença.

Método: Estudo retrospectivo, descritivo, exploratório, quantitativo, através 204 fichas de notificação de sífilis congênita no período de janeiro de 2016 a dezembro de 2017.

Resultados: Os achados mostraram que 88,7% das puérperas realizaram o pré-natal. Em relação aos recém-nascidos, 85,3% eram assintomáticos. Ao analisar o regime terapêutico instituído, 22,5% utilizaram penicilina G procaína, 22,5% penicilina G cristalina e 20,6% penicilina benzatina G.

Conclusão: O tratamento instituído por essa maternidade filantrópica para recém-nascidos com sífilis congênita está alinhado às diretrizes propostas pelo Ministério da Saúde. Os sintomas clínicos não representam um achado frequente durante o período neonatal, no entanto, podem ocorrer mais tarde.

Palavras-chave: sífilis congênita, cuidado pré-natal, notificação compulsória.

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