

## ORIGINAL ARTICLE

# CONGENITAL SYPHILIS: PRENATAL CARE AND TREATMENT OF PREGNANT WOMEN AND THEIR PARTNERS

Jéssica Strube Holztrattner<sup>1</sup>, Graciele Fernanda da Costa Linch<sup>2</sup>, Adriana Aparecida Paz<sup>3</sup>, Helga Geremias Gouveia<sup>4</sup>, Débora Fernandes Coelho<sup>5</sup>

### ABSTRACT

**Objective:** to analyze the onset and association of congenital syphilis with prenatal care and treatment of pregnant women and their partners.

**Method:** Retrospective observational study conducted in the 2006-2015 period based that looked at data from Brazil, Rio Grande do Sul and Porto Alegre, based on indicators of the Brazilian Ministry of Health.

**Results:** The rate of congenital syphilis in children under one year of age increased from 2 to 6.5 in Brazil; from 1.5 to 11.5 in Rio Grande do Sul, and from 4.4 to 30.2 in Porto Alegre. Around 74% of women performed prenatal care at the municipal, state and federal levels. Of the total number of pregnant women, 80% were not treated or were improperly treated. The percentage of treatment of their partners did not exceed 20.5%.

**Conclusion:** The present study reported an increase in the onset of congenital syphilis. Moreover, prenatal care did not ensure adequate treatment of pregnant women and their partners.


**DESCRIPTORS:** Syphilis; Syphilis, Congenital; Perinatal Care; Public Health; Public Health Nursing.

### HOW TO REFERENCE THIS ARTICLE:

Holztrattner JS, Linch GF da C, Paz AA, Gouveia HG, Coelho DF. Congenital syphilis: prenatal care and treatment of pregnant women and their partners. *Cogitare enferm.* [Internet]. 2019 [access "insert day, month and year"]; 24. Available at: <http://dx.doi.org/10.5380/ce.v24i0.59316>.



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

<sup>1</sup>Nurse. Attending a master's degree program in Nursing. Universidade Federal de Ciências da Saúde de Porto Alegre. Porto Alegre, RS, Brazil. 

<sup>2</sup>Nurse. PhD in Nursing. Nursing Professor from Universidade Federal de Ciências da Saúde de Porto Alegre. Porto Alegre, RS, Brazil. 

<sup>3</sup>Nurse. PhD in Nursing. Nursing Professor from Universidade Federal de Ciências da Saúde de Porto Alegre. Porto Alegre, RS, Brazil. 

<sup>4</sup>Nurse. PhD in Health Sciences. Nursing Professor from Universidade Federal do Rio Grande do Sul. Porto Alegre, RS, Brazil. 

<sup>5</sup>Nurse. PhD in Nursing. Nursing Professor from Universidade Federal de Ciências da Saúde de Porto Alegre. Porto Alegre, RS, Brazil. 

## **SÍFILIS CONGÊNITA: REALIZAÇÃO DO PRÉ-NATAL E TRATAMENTO DA GESTANTE E DE SEU PARCEIRO**

### **RESUMO**

*Objetivo: analisar a ocorrência e a associação da sífilis congênita com a realização do pré-natal e tratamento da gestante e do parceiro.*

*Método: estudo retrospectivo do período de 2006 a 2015, observando dados do Brasil, Rio Grande do Sul e Porto Alegre, com base em indicadores do Ministério da Saúde.*

*Resultados: a taxa de sífilis congênita em menores de um ano de idade aumentou de 2 para 6,5 no Brasil, de 1,5 para 11,5 no Rio Grande do Sul e de 4,4 para 30,2 em Porto Alegre. Em torno de 74% de mulheres realizaram o pré-natal nas três esferas. Das gestantes 80% não realizaram o tratamento ou o fizeram de maneira inadequada. O percentual de tratamento do parceiro não ultrapassou 20,5%. Conclusão: esse estudo observou o aumento da ocorrência da sífilis congênita. Ainda, a realização do pré-natal não assegurou tratamento adequado das gestantes e de seus parceiros.*

**DESCRITORES:** Sífilis; Sífilis Congênita; Assistência Perinatal; Saúde Pública; Enfermagem em Saúde Pública.

## **SÍFILIS CONGÉNITA: REALIZACIÓN DEL PRENATAL Y TRATAMIENTO DE LA GESTANTE Y DE SU PAREJA**

### **RESUMEN**

*Objetivo: evaluar la ocurrencia y la asociación de la sífilis congénita con la realización del prenatal y tratamiento de la gestante y de la pareja.*

*Método: estudio retrospectivo del periodo de 2006 a 2015, con observación de datos de Brasil, Rio Grande do Sul y Porto Alegre, considerándose indicadores del Ministerio de la Salud.*

*Resultados: el índice de sífilis congénita en menores de un año de edad ha crecido de 2 para 6,5 en Brasil, de 1,5 para 11,5 en Rio Grande do Sul y de 4,4 para 30,2 en Porto Alegre. Alrededor de 74% de mujeres realizaron el prenatal en las tres esferas. De las gestantes 80% no realizaron el tratamiento o lo hicieron de modo inadecuado. El percentual de tratamiento de la pareja no excedió 20,5%.*

*Conclusión: ese estudio observó el crecimiento de la ocurrencia de la sífilis congénita. Sin embargo, la realización del prenatal no aseguró tratamiento adecuado de las gestantes y de sus parejas.*

**DESCRIPTORES:** Sífilis; Sífilis Congénita; Atención Perinatal; Salud Pública; Enfermería en Salud Pública.

## INTRODUCTION

Syphilis is a chronic systemic infectious contagious disease transmitted sexually (acquired syphilis) or vertically (congenital syphilis) caused by a spirochete bacterium called *Treponema pallidum*. It was first identified in the 15<sup>th</sup> century. Notification of congenital syphilis has become compulsory since 1986 and in pregnant women since 2005. Despite the availability of a low cost and effective treatment, syphilis is still prevalent in the population and is considered a serious public health problem<sup>(1)</sup>.

There are three stages in the progression of syphilis: primary, secondary and tertiary. Temporary cutaneous manifestations may occur, as well as latency periods. Congenital syphilis is transmitted via the placenta at any clinical stage and at any time during pregnancy when not treated or improperly treated. The clinical presentation of congenital syphilis varies according to the length of fetal exposure to *Treponema*, the harmfulness of the condition and the treatment of maternal infection, among other factors. In the most severe cases of the disease abortion, fetal death or neonatal death may occur<sup>(2)</sup>.

The World Health Organization (WHO) estimates that one million pregnant women worldwide are affected by syphilis every year, leading to more than 300,000 fetal and neonatal deaths and putting more than 200,000 children at risk of premature death<sup>(3)</sup>. In Brazil, in the last five years there has been a constant increase in the number of cases of syphilis in pregnant women, as well as congenital syphilis. The perception of this increase can be attributed, on the one hand, to the improvement of the surveillance system and the increase of the use of rapid tests and, on the other hand, to the reduction of the use of condoms, the resistance of health professionals to administer penicillin in Primary Care, to the worldwide shortage of penicillin, among other factors<sup>(3)</sup>.

Likewise, the increase in congenital syphilis reveals the limitations of health services, particularly prenatal care, since early diagnosis and treatment of pregnant women are relatively simple and quite effective measures to prevent this form of the disease<sup>(2)</sup>. A study conducted in Rio de Janeiro that showed a significant association between vertically transmitted syphilis and late prenatal care, fewer appointments than recommended, inadequate management of diagnosis and treatment, and lack of counseling corroborated this statement<sup>(4)</sup>.

Another aspect that deserves mention is that although syphilis prevention and the treatment of the disease in pregnancy are easy to handle and inexpensive, the treatment of children with congenital syphilis is prolonged and very costly. Thus, the increase in the number of syphilis cases is an indication of poor prenatal care, with refusal of implementing prevention measures. Therefore, congenital syphilis can be considered a true marker of the quality of maternal and child health care<sup>(5)</sup>.

In view of the abovementioned, health professionals and managers should be aware of the magnitude of the referred problem, in order to provide more effective prevention strategies to prevent diseases that impair the health of a large percentage of fetuses and neonates, such as congenital syphilis. Therefore, the present study aimed to analyze the onset and association of congenital syphilis with prenatal care and treatment of pregnant women and their partners.

## METHOD

This is a retrospective historical series study covering the 2006-2015 period based on secondary data and indicators published by the Department of STD, AIDS and Viral Hepatitis of the Ministry of Health<sup>(6)</sup>. The variables selected in the database were pregnant women with syphilis per year of diagnosis, congenital syphilis in children under one year of age, congenital syphilis according to information related to the prenatal care of the pregnant women, congenital syphilis according to information on the treatment regimen

for pregnant women and congenital syphilis according to information about the treatment of the women's partners.

The temporal delimitation was related to the availability in the information system consulted. The use of data from 2006 was intentional to analyze the indicators of the last 10 years, making data comparison possible. This time frame was significant because in 2005 syphilis in pregnant women was included in the diseases of compulsory notification list, which does not directly influence the data shown in this study.

Data was collected in November 2017, considering the aforementioned variables in the three governmental spheres, as follows: Brazil (federal), Rio Grande do Sul (state) and Porto Alegre (municipal). Data analysis was temporal and the indicators were organized and analyzed in a Microsoft Excel® 2007 worksheet. For analysis, data obtained in the 10 years of the study for all the variables mentioned were compared between the three political-administrative spheres.

Because it used a public domain database provided online by the Ministry of Health and did not include variables that make it possible to identify the subjects of the research, the present study did not need to be submitted to the Research Ethics Committee. However, all ethical precepts were observed in accordance with Resolution 466/2012 of the National Health Council<sup>(7)</sup>.

## RESULTS

The present study found that 152,809 cases of syphilis were reported in pregnant women in Brazil; 9,386 cases in Rio Grande do Sul, and 1,870 cases in the city of Porto Alegre between 2006 and 2015. Figure 1 shows the detection rates of pregnant women with syphilis in a time evolution, with an increase in the number of cases over the period.

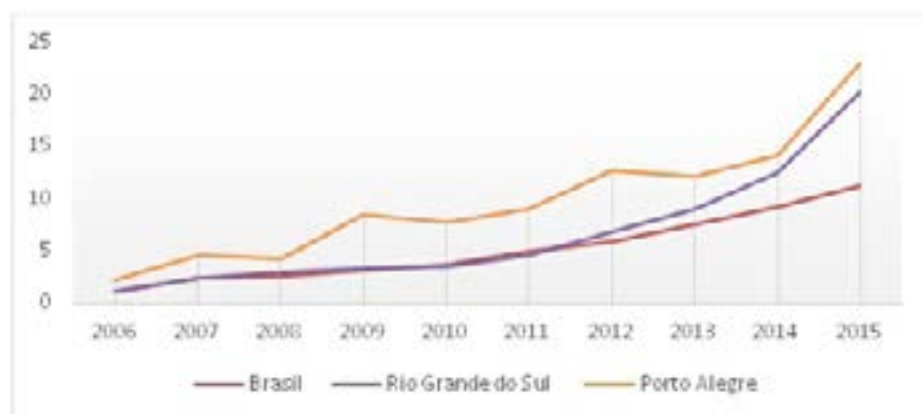


Figure 1 – Detection rates (per 1,000 live births) of pregnant women with syphilis per year of diagnosis, 2006-2015. Porto Alegre, RS, Brazil, 2017

Source: Department of STD, AIDS and Viral Hepatitis, Department of Health Surveillance, Ministry of Health<sup>(6)</sup>

Comparison between the first and last year of the study period shows that the rate of detection of cases of maternal syphilis rose from 1.2 to 11.2 in Brazil; from 1.1 to 20.2 in Rio Grande do Sul, and from 2.2 to 23 in Porto Alegre. It is noteworthy that the rate of Porto Alegre is higher than the Brazilian rate in the study period, as well as higher than the rate of Rio Grande do Sul after 2011.

Regarding congenital syphilis in children under one year of age, as shown in Figure 2,

in the 2006-2015 period, 100,681 cases were notified in Brazil; 6,760 cases in Rio Grande do Sul, and 2,659 cases in Porto Alegre. The incidence of congenital syphilis in children under one year in Brazil and Rio Grande do Sul was similar and remained stable from 2006 to 2008. As of 2009, there was an increase in this incidence, which was higher in Rio Grande do Sul compared to the Brazilian rate. The incidence in Porto Alegre over the study period was higher than the national and state rates. Moreover, it can be seen that every year there is a significant increase in the rate of congenital syphilis among children under one year of age in Porto Alegre.

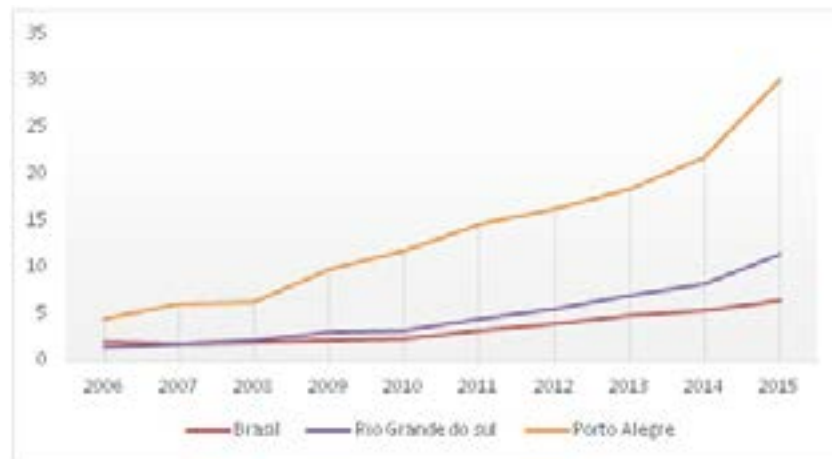


Figure 2 – Incidence rates (per 1,000 live births) of congenital syphilis in children under one year of age, 2006-2015. Porto Alegre, RS, Brazil, 2017

Source: Department of STD, AIDS and Viral Hepatitis, Department of Health Surveillance, Ministry of Health<sup>(6)</sup>

Comparison between years 2006 and 2015 shows an increase in the incidence rate of congenital syphilis in children under one year of age from 2 to 6.5 in Brazil; 1.5 to 11.5 in Rio Grande do Sul and 4.4 to 30.2 in Porto Alegre. Although Porto Alegre had higher detection rates throughout the study period, it should be stressed that in 2015 the incidence was 4.7 times higher than in Brazil.

National, state and municipal data on prenatal care in cases where congenital syphilis was confirmed was similar in the study period. The percentage of women who underwent prenatal care did not vary significantly in Brazil, and was around 79,000 (74%). The same tendency was observed in Rio Grande do Sul and Porto Alegre, with approximately 5,600 (76%) and 2000 (72%) of women who underwent prenatal care, respectively. In Porto Alegre and Rio Grande do Sul the highest rates were observed in 2007 and in Brazil in 2015.

Although prenatal rates were higher than 70% in cases of vertical transmission, the percentage distribution of congenital syphilis diagnosed during prenatal care did not exceed 62.5% in the government spheres analyzed in this study. The average was 4,780 (45%) in Brazil, and 409 (55%) and 158 (55%) in Rio Grande do Sul and Porto Alegre, respectively. The aforementioned rate of 62.5% of congenital syphilis diagnosed in prenatal care occurred in the state of Rio Grande do Sul in 2015, followed by the second highest rate, of 59%, which was also reported in 2015, in the city of Porto Alegre.

Regarding the treatment delivered to pregnant women in the cases where congenital syphilis was confirmed, the results obtained in this study are not very reassuring, as shown in Figure 3. The percentage of pregnant women who were not treated or were improperly treated is higher than 80% of the cases in Brazil and Rio Grande do Sul. Data for Porto Alegre was even more alarming, with a percentage of women not treated or improperly treated higher than 90%.



Figure 3 – Percentage distribution of congenital syphilis cases according to the mother’s treatment regimen, 2006-2015. Porto Alegre, RS, Brazil, 2017

Source: Department of STD, AIDS and Viral Hepatitis, Department of Health Surveillance, Ministry of Health<sup>(6)</sup>

In the governmental spheres analyzed, the percentage distribution of cases of congenital syphilis, according to information on the treatment of the partners of the pregnant women, was very low throughout the entire period of the study, not exceeding 20.5%. Rio Grande do Sul and Porto Alegre followed the national trend, with a lower percentage between the years 2008 and 2013. Although there were no positive results, data from the capital Porto Alegre was worse than the data from Rio Grande do Sul and Brazil, as shown in Figure 4. In 2008, the percentage of partners of pregnant women with syphilis who were treated was 4.3% in Porto Alegre. Only in 2006 and 2015 this rate was higher than 10%.

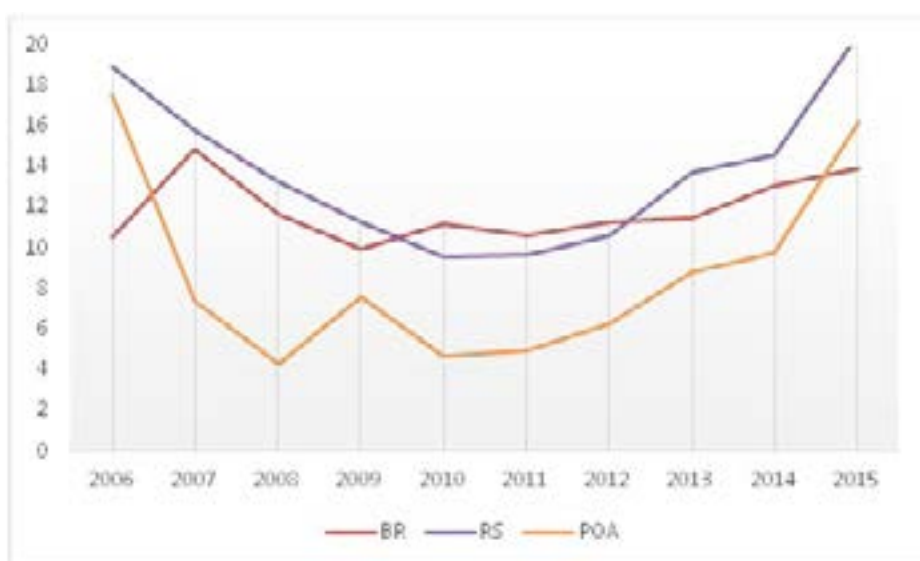


Figure 4 – Percentage distribution of congenital syphilis cases according to information about the treatment of the partners of the pregnant women, 2006-2015. Porto Alegre, RS, Brazil, 2017

Source: Department of STD, AIDS and Viral Hepatitis, Department of Health Surveillance, Ministry of Health<sup>(6)</sup>

## DISCUSSION

The data described in this study showed an increase in the rates of syphilis in pregnant women in Brazil, especially in Rio Grande do Sul and in the city of Porto Alegre. In 2015, the South and Southeast Regions exceeded the Brazilian rates of pregnant women with syphilis per 1,000 live births. The highest detection rate occurred in the state of Mato Grosso do Sul, with 21.9 cases followed by the state of Rio Grande do Sul, with a rate of 20.2. The lowest detection rate was reported in Rio Grande do Norte, with 4.5 cases<sup>(8)</sup>.

Regarding congenital syphilis, in 2015, the Southern, Southeastern and Northeastern regions had the highest incidence rates, which were higher than the national rate of 6.5 cases in children under one year of age. The Brazilian state with the highest rate in 2015 was Rio de Janeiro, with 12.4 cases, followed by Rio Grande do Sul, with 11.5 cases. The lowest rate occurred in Roraima, with 1.3 cases. Regarding the Brazilian capitals, only seven were below the national average, as follows: Curitiba, Manaus, São Paulo, Rio Branco, Brasília, Goiânia, Macapá and Boa Vista. Porto Alegre has the highest incidence rate among Brazilian capitals, and in 2015, it was 4.7 times higher than the national incidence rate of congenital syphilis.

The findings of this study show a progressive increase in the incidence of congenital syphilis in the last ten years, in the three governmental spheres analyzed, particularly after 2010. The rates of congenital syphilis are higher than the maximum national parameter target set by the Ministry of Health.

Other Brazilian states have also experienced an increase in the incidence of congenital syphilis in recent years and a rate higher than the one recommended by the Ministry of Health, which is one case per 1,000 live births, indicating that educational actions should be carried out and effective measures for the control of this disease are needed. Syphilis is an easily diagnosed and treated disease. Therefore, the promotion of better perinatal care, through better care of pregnant women, to avoid vertical transmission is urgently needed<sup>(5,9)</sup>.

Regarding the notification of the disease in Porto Alegre, the rate of congenital syphilis was higher than that of maternal syphilis throughout the entire period of the study, even when only cases of congenital syphilis in children under one year of age were considered. This fact corroborates the findings of studies that reported gaps in the epidemiological surveillance system and suggests possible gaps in prenatal care<sup>(8-9)</sup>.

Despite the scientific consensus on the existence of weaknesses in healthcare services, this significant increase in the rate of detection of syphilis throughout the national territory is also due to the improvement in the notification of cases, the possible expansion of diagnostic access and the advances in epidemiological surveillance<sup>(8-9)</sup>. However, although positive interpretation of data is plausible, due to the improvement in records, it is important to recognize the limitation of the use of secondary data sources, and the occurrence of underreporting. The omission of underreporting may suggest even higher rates of the disease in the three political-administrative spheres considered in the study.

Regarding prenatal care in the cases of confirmed congenital syphilis, as in other studies, it was found that most pregnant women received prenatal care. However, it did not prevent the increase in the number of cases of the disease<sup>(5,10-11)</sup>. This association of prenatal care with confirmed cases of congenital syphilis may suggest that strategic and educational actions should be taken during prenatal care to improve treatment<sup>(5,10)</sup>. However, greater access to diagnostic tests in Rio Grande do Sul and Porto Alegre probably results in a greater detection of syphilis in pregnant women and, consequently, generates more notifications, which may explain the higher occurrence of syphilis in these regions.

According to a similar study conducted in the state of Piauí, in the cases of maternal-fetal transmission of *Treponema pallidum*, 82.4% of the pregnant women had undergone prenatal care. However, only 40.4% of syphilis diagnoses occurred during pregnancy<sup>(12)</sup>.

A study carried out in six Brazilian states reported that the control of the disease remains a challenge for prenatal care, despite the technological advances that facilitate the diagnosis of syphilis in pregnant women, such as the implementation of rapid tests for syphilis in basic care. Screening for maternal syphilis is one of the most cost-effective actions in public health, with unquestionable benefits. Therefore, it should be more properly organized in healthcare services<sup>(13)</sup>.

A study conducted in Campo Grande, in the state of Mato Grosso do Sul, compared two different periods in the four largest maternity hospitals under the Unified Health System (SUS). According to the referred study, in 2006, 75% of the pregnant women diagnosed with syphilis reported prenatal follow-up; in 2011, this coverage was 100%. However, in the first period, 58% of the diagnoses occurred after childbirth. In the second period, the improvement was significant, increasing to 66.7% of pre-delivery diagnoses. Regarding the treatment of congenital syphilis, in 2006, 67% of pregnant women were not properly treated. In turn, in 2011, 66.7% of pregnant women have undergone adequate treatment, thus contributing to the prevention of vertical transmission<sup>(9)</sup>.

As in the study described in this article, other Brazilian states and municipalities also reported a low rate of adequate treatment in syphilitic pregnant women, with significant worsening in the cases of maternal-fetal transmission<sup>(5,8,11,13-14)</sup>. These pregnant women who transmitted the *Treponema pallidum* to their children began prenatal care later, had a lower number of appointments, less serologic tests for syphilis and few records for reagents tests in the prenatal care card of pregnant women. Overall, this study estimated that only 26% of the adverse outcomes of the disease during pregnancy were avoided by prenatal care<sup>(14)</sup>.

Adequate treatment of maternal syphilis with penicillin can prevent 97% of the vertical transmission of syphilis, and better results are obtained when the treatment occurs around the 24<sup>th</sup> to the 28<sup>th</sup> week of gestation. Proper management of gestational syphilis implies early identification of the infected pregnant women and appropriate treatment. It should be stressed that in order to prevent reinfection of pregnant women, their sexual partners should also be treated<sup>(14)</sup>.

The lack of/inadequate treatment of partners of pregnant women is considered by different studies as the main aggravating factor of the low rate of treatment of pregnant women with syphilis. The number of partners who were not treated was found to be higher than the number of partners treated in all the years of the survey (2000 to 2009) by a study conducted in the state of Ceará<sup>(5)</sup>. In the public maternities of the Federal District, as mentioned in another study<sup>(15)</sup>, 41.8% of the pregnant women with syphilis received proper care, and the main reason for the treatment to be considered inadequate was the lack of and/or inadequacy of the treatment of their partners (88.1%).

As in other studies, the high number of partners who did not receive adequate treatment for syphilis found in this study leads to the assumption of negligence in the health services, since the treatment of sexual partners is crucial for the effective treatment of pregnant women, preventing them from being re-exposed to *Treponema* and avoiding vertical transmission<sup>(5,15)</sup>. It can be concluded, therefore, that the high rate of maternal-fetal transmission of the disease may be related to the low effectiveness of the basic care network in providing prenatal care.

In a study on congenital syphilis in children under one year of age, it was found that most cases concerned pregnant women whose partners did not adhere to treatment. It is suggested that this fact can be partly justified by the idea that health services are mostly destined to women, children and the elderly. Thus, men would have greater difficulty in accessing health services, and they tend to be less concerned about their health status than women<sup>(15)</sup>.

Based on the aforementioned studies and on our findings, the understanding that adequate prenatal care is the most effective measure for the reduction of new cases of congenital syphilis has been constructed. In this regard, in Fortaleza, Ceará, a study investigated the knowledge of health professionals responsible for prenatal care about



vertical transmission of syphilis and found that they had poor knowledge about the diagnosis and treatment of pregnant women, their partners, as well as of the follow-up of pregnant women with syphilis<sup>(16)</sup>. Moreover, as it is agreed that strategies for the involvement of pregnant women's sexual partners in treatment must be developed, hypotheses have emerged and should be investigated, so that the reasons and difficulties related to treatment adherence are identified<sup>(5,16)</sup>.

## CONCLUSION

Our findings show that there has been a progressive increase in the incidence of syphilis in pregnant women and congenital syphilis over the last ten years in Brazil, especially in Rio Grande do Sul and in the capital Porto Alegre, which had the highest rate of congenital syphilis among the Brazilian capitals.

It was found that prenatal care did not ensure proper treatment for a significant percentage of pregnant women and their partners, and it is known that when properly provided such care may prevent infection in newborn babies. Most of the pregnant women who participated in this study received prenatal care, but this did not prevent the increasing incidence rates of congenital syphilis. Thus, it is necessary to devise new strategies in order to raise awareness among pregnant women and their partners of the importance of prenatal care and persuade them to adhere to the treatment, as well as propose effective prevention actions.

It is also believed that permanent education for health professionals involved in prenatal care is necessary, since basic health units allow greater contact between health professionals and users, making it easier to receive and persuade the pregnant women's sexual partners to adhere to treatment. Dissemination of knowledge through education, with emphasis on disease prevention and treatment, is an important aspect to be considered in reversing the high rates of congenital syphilis.

The present study found that a high number of sexual partners of pregnant women with syphilis did not receive adequate treatment for syphilis. However, further studies addressing the difficulties of adherence of these individuals to treatment are necessary. Despite the implementation of Informative Note No. 2-SEI/ 2017-DIAHV/SVS/MS, which underestimates information on the concomitant treatment of pregnant women's sexual partners in their classification of appropriate treatment, it is crucial that the partners are treated for syphilis due to high rate of inappropriately treated pregnant women.

This study contributed to better understanding of the onset of congenital syphilis and its association with prenatal care and treatment of pregnant women and their partners. It is hoped that the sharing of knowledge can help in the implementation of preventive measures to avoid the progressive increase of this disorder.

One limitation of this study was the use of official sources of secondary data for analysis of the information and the possible occurrence of underreporting. Studies in different health care settings and with the participation of health professionals are suggested, as they may provide a better understanding of the impact of this disorder on the health of newborn babies, pregnant women and their partners.

## REFERENCES

1. Guerra HS, Costa CV, Santos IAB, Silva JM, Barcelos TF. Sífilis Congênita: repercussões e desafios. ACM arq. catarin. Med. [Internet]. 2017 [access on 10 nov 2017]; 46(3). Available at: <http://www.acm.org.br/acm/seer/index.php/arquivos/article/view/94>.
2. Ministério da Saúde (BR). Doenças infecciosas e parasitárias: guia de bolso. Secretaria de Vigilância em

- Saúde, Departamento de Vigilância Epidemiológica. 8. ed. Brasília (DF): Ministério da Saúde; 2010. 444 p.
3. Cavalcante AL, Brito SMF, Benzaken AS, Rohlf DB, Duarte E, Ferreira GS, et al. Boletim Epidemiológico: Sífilis 2017. Brasília: Ministério da Saúde (BR). Secretária de Vigilância em Saúde. [Internet]. 2017 [access on 10 nov 2017]; 48(36). Available at: <http://www.aids.gov.br/pt-br/pub/2017/boletim-epidemiologico-de-sifilis-2017>.
  4. Domingues RMSM, Saracen V, Hartz ZMA, Leal MC. Sífilis congênita: evento sentinela da qualidade da assistência pré-natal. Rev. Saúde Públ. [Internet]. 2013 [access on 03 nov 2017]; 47(1). Available at: <http://dx.doi.org/10.1590/S0034-89102013000100019>.
  5. Costa CC da, Freitas LV, Sousa DMN, Oliveira LL de, Chagas ACMA, Lopes MVO, et al. Sífilis congênita no Ceará: análise epidemiológica de uma década. Rev. Esc. Enferm. USP. [Internet]. 2013 [access on 03 nov 2017]; 47(1). Available at: <http://dx.doi.org/10.1590/S0080-62342013000100019>.
  6. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Departamento de DST, AIDS e Hepatites Virais. [Internet] [access on 10 nov 2017] Available at: <http://indicadorestifilis.aids.gov.br>.
  7. Ministério da Saúde (BR). Conselho Nacional de Saúde. Resolução nº466, de 12 de dezembro de 2012. Dispõe sobre as diretrizes e normas regulamentadoras de pesquisa envolvendo seres humanos. Brasília (DF); 2012. Available at: <http://conselho.saude.gov.br/resolucoes/2012/reso466.pdf>.
  8. Ministério da Saúde (BR). Secretária de Vigilância em Saúde. Boletim Epidemiológico: Sífilis 2016. [Internet] Brasília: Ministério da Saúde; 2016 [access on 15 out 2017] Available at: <http://www.aids.gov.br/pt-br/pub/2016/boletim-epidemiologico-de-sifilis-2016>.
  9. Figueiró-Filho EA, Freire SSA, Souza BA, Aguenta GS, Maedo CM. Sífilis e gestação: estudo comparativo de dois períodos (2006 e 2011) em população de puérperas. DST – J Bras Doenças Sex Transm. [Internet]. 2012 [access on 17 nov 2017]; 24(1). Available at: <http://dx.doi.org/10.5533/2177-8264-201224109>.
  10. Carvalho IS, Brito RS. Congenital syphilis in the state of Rio Grande do Norte: a descriptive study in the period 2007-2010. Epidemiol. Serv. Saúde. [Internet] 2014 [access on 17 nov 2017]; 23(2). Available at: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S2237-96222014000200287](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S2237-96222014000200287).
  11. Moreira KFA, Oliveira DM, Alencar LN, Cavalcante DFB, Pinheiro AS, Orfão NH. Perfil dos casos notificados de sífilis congênita. Cogitare enferm. [Internet]. 2017 [access on 24 nov 2017]; 22(2). Available at: <http://dx.doi.org/10.5380/ce.v22i2.48949>.
  12. Barbosa DRM, Almeida MG de, Silva AO, Araújo AA, Santos AG dos. Perfil epidemiológico dos casos de sífilis gestacional. Rev. enferm. UFPE on line. [Internet]. 2017 [access on 17 nov 2017]; 11(5). Available at: <http://dx.doi.org/10.5205/reuol.11077-98857-1-SM.1105201716>.
  13. Saraceni V, Pereira GFM, Silveira MF, Araujo MAL, Miranda AE. Vigilância epidemiológica da transmissão vertical da sífilis: dados de seis unidades federativas no Brasil. Rev Panam Salud Publica. [Internet]. 2017 [access on 17 nov 2017]; 41. Available at: <https://scielosp.org/pdf/rpsp/2017.v41/e44/pt>.
  14. Domingues RMSM, Leal MC. Incidência de sífilis congênita e fatores associados à transmissão vertical da sífilis: dados do estudo Nascer no Brasil. Cad. Saude Publica. [Internet]. 2016 [access on 17 nov 2017]; 32(6). Available at: <http://dx.doi.org/10.1590/0102-311X00082415>.
  15. Magalhães DMS, Kawaguchi IAL, Dias A, Calderon IMP. Sífilis materna e congênita: ainda um desafio. Cad. Saude Publica. [Internet]. 2013 [access on 17 nov 2017]; 29(6). Available at: <http://dx.doi.org/10.1590/S0102-311X2013000600008>.
  16. Silva DMA da, Araújo MAL, Silva RM da, Andrade RFV, Moura HJ de, Esteves ABB. Knowledge of healthcare professionals regarding the vertical transmission of syphilis in Fortaleza-CE, Brazil. Texto contexto – enferm. [Internet]. 2014 [access on 10 nov 2017]; 23(2). Available at: <http://dx.doi.org/10.1590/0104-07072014000510013>.

Received: 07/05/2018

Finalized: 12/03/2019

**Corresponding author:**

Jéssica Strube Holztrattner

Universidade Federal de Ciências da Saúde de Porto Alegre

R. Sarmento Leite, 245 – 90050-170 - Porto Alegre, RS, Brasil

E-mail: jessica.holztrattner@gmail.com

**Role of Authors:**

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - JSH, GFCL, AAP, HGG, DFC

Drafting the work or revising it critically for important intellectual content - JSH, GFCL, AAP, HGG, DFC

Final approval of the version to be published - JSH, GFCL, AAP, HGG, DFC

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - JSH

---