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ANALYSIS OF CONGENITAL SYPHILIS CASES IN CRATEÚS FROM 2014 TO 2023

ANÁLISE DOS CASOS DE SÍFILIS CONGÊNITA EM CRATEÚS DE 2014 A 2023

ANÁLISIS DE CASOS DE SÍFILIS CONGÉNITA EN CRATEÚS DE 2014 A 2023

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ABSTRACT
Objective: To analyze the epidemiological profile of CS cases in the municipality of Crateús (CE) between 2014 and 2023, highlighting important scenarios and variables regarding the topic addressed and defining forms of prevention based on health care programs. Methods: Cross-sectional epidemiological research carried out in September 2024, using data from SINAN/DATASUS. Eight health and sociodemographic variables were analyzed, including number of new cases, prenatal care, age group, and maternal education, with support from sources such as PubMed, SciElo, and Google Scholar. Results: It was found that the year with the highest rate of confirmed cases was 2022. In addition, the brown race was the most prevalent among cases. Final considerations: The pattern of confirmed cases suggests that recent interventions, potentially driven by public health policies and awareness campaigns, may be beginning to have an effect.
Keywords: *Syphilis Congenital; Prenatal Diagnosis; Racial Groups.*

RESUMO
Objetivo: Analisar o perfil epidemiológico dos casos de SC no município de Crateús (CE) entre os anos de 2014 a 2023, destacando cenários e variáveis importantes no que tange ao tema abordado e definindo formas de prevenção baseadas em programas de assistência à saúde. Métodos: Pesquisa epidemiológica transversal realizada em setembro de 2024, utilizando dados do SINAN/DATASUS. Foram analisadas oito variáveis de saúde e sociodemográficas, incluindo número de casos novos, realização de pré-natal, faixa etária e escolaridade da mãe. Resultados: Constatou-se que o ano em que ocorreu a maior taxa de casos confirmados foi o de 2022. Além disso, a raça parda foi a de maior prevalência entre os casos. Considerações finais: O padrão de casos confirmados sugere que intervenções recentes, potencialmente impulsionadas por políticas de saúde pública e campanhas de conscientização, podem estar começando a surtir efeito.
Descritores: *Sífilis Congênita; Diagnóstico Pré-Natal; Grupos Raciais*.

RESUMEN
Objetivo: Analizar el perfil epidemiológico de los casos de SC en el municipio de Crateús (CE) entre 2014 y 2023, destacando escenarios y variables importantes en relación con el tema abordado y definiendo formas de prevención basadas en programas de atención a la salud. Métodos: Investigación epidemiológica transversal realizada en septiembre de 2024, utilizando datos del SINAN/DATASUS. Se analizaron ocho variables de salud y sociodemográficas, incluyendo número de casos nuevos, atención prenatal, grupo etario y educación de la madre, con apoyo de fuentes como PubMed, SciElo y Google Scholar. Resultados: Se encontró que el año en el que se presentó la mayor tasa de casos confirmados fue el 2022. Además, la raza parda fue la de mayor prevalencia entre los casos. Consideraciones finales: El patrón de casos confirmados sugiere que las intervenciones recientes, potencialmente impulsadas por políticas de salud pública y campañas de concientización, pueden estar comenzando a tener efecto.
Descriptores: *Sífilis Congénita; Diagnóstico Prenatal; Grupos Raciales.*

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INTRODUCTION

Syphilis (SP) is a sexually transmitted infection caused by the bacterium *Treponema pallidum*. The main form of contagion occurs through sexual intercourse (whether oral, vaginal, or anal), and many infected individuals do not have symptoms, which contributes to the continuous spread of the disease. Without proper treatment, the infection can, over time, progress to severe systemic problems[1].

SF can also be transmitted vertically, that is, from mother to fetus, which results in a fetal mortality rate of over 40%1,2. The lack of adequate treatment in infected pregnant women can lead to serious problems for the baby, such as miscarriage, premature birth, low birth weight, fetal death, and the appearance of manifestations of congenital syphilis (CS), both shortly after birth and in later stages[1].

Fetal infection typically occurs during the interval between the 16th and 28th week of gestation[3]. Although CS is a preventable condition whose diagnosis is not overly complex, it remains a significant public health challenge due to its remarkable transmission capacity and the frequency with which it triggers serious and debilitating complications[4].

The management of CS, when diagnosed early, is relatively straightforward and has been shown to be highly effective. The recommended protocol includes the administration of benzathine penicillin G, which is widely recognized as the gold standard treatment for infected pregnant women and newborns[1].

In Brazil, CS has been classified as a notifiable disease since December 1986. To combat this condition, the country adhered to international commitments from 1992. Even so, the number of cases continues to increase[5].

Thus, it is evident the need to analyze the participation of mothers in programs to help during pregnancy, such as prenatal care, and the verification of social determinants so that measures can be proposed to combat this problem that affects the population of Crateús.

Thus, the study aims to analyze the epidemiological profile of CS cases in the municipality of Crateús (CE) between the years 2014 and 2023, highlighting important scenarios and variables regarding the topic addressed and defining forms of prevention based on health care programs.

METHODS

This is a descriptive epidemiological cross-sectional study. This study addresses CS cases in the municipality of Crateús between the years 2014-2023.

The survey was carried out in September and in the first half of October 2024, through a survey of data from the Department of Informatics of the Unified Health System (DATASUS), more specifically in the Notifiable Diseases Information System (SINAN), using the section related to "Notifiable Diseases and Diseases - 2007 onwards", with the subsection "Congenital Syphilis", and finally the region of "Ceará" was chosen as the geographic coverage, with the data referring to the municipality of Crateús being delimited.

Five variables were selected, which can be divided into health variables and sociodemographic variables, in addition to being subdivided into quantitative or qualitative (nominal or ordinal).

Health variables: Number of confirmed cases (Quantitative); Period of discovery of maternal syphilis (Ordinal qualitative).

Sociodemographic variables: Mother's age group (ordinal qualitative); Mother's education level (ordinal qualitative); Race (Nominal qualitative).

RESULTS

Of note is the significant increase in CS cases between 2021 and 2022 and the subsequent reduction in 2023. This pattern suggests that recent interventions, potentially driven by public health policies and awareness campaigns, may be starting to have an effect, although the need for continued surveillance is emphasized to sustain this downward trend[6].

Table 1 shows that, until 2020, CS cases in the municipality of Crateús represented small variations, highlighted by the values of 5.19% (n=4) in 2014; 7.79% (n=6) in 2015; 6.49% (n=5) in 2016; 3.90% (n=3) in 2017. Given that it is repeated in 2018, 11.69% (n=9) in 2019 and 10.39% (n=8) in 2020. However, in the years 2021 and 2022, there was an exorbitant increase in the presentation of cases, jumping from 8 cases in 2020 to 16 in 2021, an evolution from 10.39% (n=8) to 20.78% (n=16). These data returned to a normality in the number of presentations in 2023, with a reduction between 2022 and 2023, which had 23.38% and 6.49% (n=5), respectively.

In addition to these data, Table 1 presents the incidence rates characterized by a relative increase in the incidence of cases between 2020 and 2021, with an increase from 8.15 cases/1000 live births to 16.82 cases/1000 live births, respectively. This representation was followed by an increase in incidence in 2022, compared to 2021, in which 2022 had an incidence of 19.44 cases/1000 live births. These data show a break with the parameters visualized before 2021 and after 2022, since incidences of 3.91 cases/1000 live births in 2014 are highlighted; 5.48 in 2015; 5.24 in 2016; 3.29 in 2017; 2.80 in 2018; 8.18 in 2019; 8.15 in 2020 and 5.51 in 2023.

Table 1: Data on confirmed CS cases in Crateús and their incidence per 1000 live births between 2014 and 2023.

Year of diagnosis	Confirmed cases (n)	%	Incidence/1000 Live births
2014	4	5,19%	3,91
2015	6	7,79%	5,48
2016	5	6,49%	5,24
2017	3	3,90%	3,29
2018	3	3,90%	2,80
2019	9	11,69%	8,18
2020	8	10,39%	8,15
2021	16	20,78%	16,82
2022	18	23,38%	19,44
2023	5	6,49%	5,51
Total	77	100%	-

Source: Ministry of Health/SVS – Notifiable Diseases Information System - Sinan Net.

Table 2 presents data on maternal syphilis (MS) in mothers of children who were diagnosed with CS. Thus, it shows that the discovery of MS, in most cases, occurred during the prenatal period, which represented 72.73% (n=56) among the diagnosed cases. Furthermore, the discovery of MS was represented in a decreasing manner, respectively, by the following forms: at the time of delivery/curettage, with 18.18% (n=14), and after delivery, represented by 6.49% (n=5); The remaining 2.60% (n=2) did not answer or left the answer blank.

Table 2: Data on the discovery of the presence of maternal syphilis in mothers of children with CS in the municipality of Crateús from 2014 to 2023.

Maternal Syphilis	Confirmed cases (n)	%
Ign/White	2	2,60%
During prenatal care	56	72,73%
At the time of delivery/curettage	14	18,18%
After childbirth	5	6,49%
Total	77	100,00%

Source: Ministry of Health/SVS – Notifiable Diseases Information System - Sinan Net.

Table 3 shows that, among the mothers of children diagnosed with CS, the age group of 20 to 24 years prevails, with 37.66% (n=29) of the mothers registered. The other age groups were presented in a decreasing manner: 15 to 19 years, 25 to 39 years, 30 to 34 years, 40 to 44 years and 35 to 39 years, corresponding to 23.38% (n=18), 22.08% (n=17), 9.09% (n=7), 5.19% (n=4) and 1.30% (n=1) of the mothers, respectively.

Table 3: Data on the age groups of mothers of children with CS in the municipality of Crateús between 2014 and 2023.

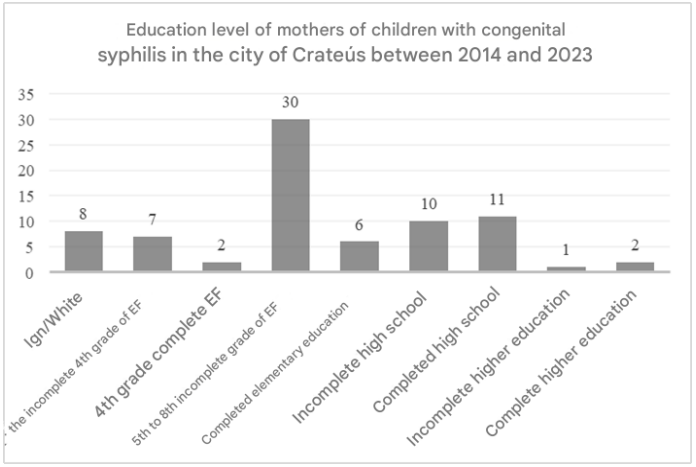
Faixa Etária Mãe	Casos Confirmados (n)	%
Em branco	1	1,30%
15-19	18	23,38%
20-24	29	37,66%
25-29	17	22,08%
30-34	7	9,09%
35-39	1	1,30%
40-44	4	5,19%
Total	77	100,00%

Source: Ministry of Health/SVS – Notifiable Diseases Information System - Sinan Net.

Graph 1 shows the expression of the education of the mothers of children with CS between 2014 and 2023, in order to highlight the occurrence, in greater numbers, among women who had incomplete 5th to 8th grade, demarcating a number of 30 cases (38.96%). It is also possible to observe that 11 cases (14.29%) were registered among people who had completed high school, 10 cases (12.99%) among those who had incomplete high school, 7 cases (9.09%) among those who had incomplete 1st to 4th grade, 6 cases (7.79%) for women with complete elementary school, 2 cases (2.60%) for those who had completed 4th grade, 2 cases (2.60%) for those who had completed higher education and 1 case (1.30%) for incomplete higher education. There was also a large expression of

mothers who did not record their education, meaning 8 cases, which represented 10.39% of the total.

Graph 1: Data on the schooling of mothers of children with CS in the municipality of Crateús from 2014 to 2023.



Source: Ministry of Health/SVS – Notifiable Diseases Information System - Sinan Net.

Table 4 highlights that the brown race was the predominant among the cases of congenital syphilis, with 87.01% (n=67). In addition, the white race was the second largest, with 7.79% (n=6), followed by black, with 1.30% (n=1), and indigenous, with 1.30% (n=1). It is worth noting that 2.60% (n=2) did not answer or did not know the child's race.

Table 4: Data on the race of children diagnosed with CS in the municipality of Crateús between 2014 and 2023.

Race	Casos Confirmados (n)	%
Ign/White	2	2,60%
White	6	7,79%
Black	1	1,30%
Brown	67	87,01%
Indigenous	1	1,30%
Total	77	100,00%

Source: Ministry of Health/SVS – Notifiable Diseases Information System - Sinan Net.

DISCUSSION

In the analysis of Table 1, a notable variation in the incidence of congenital syphilis (CS) in Crateús is observed over the years, with marked fluctuations between 2020 and 2023. Until 2020, cases showed some stability, but in 2021 and 2022 there was an exorbitant increase. Specifically, the data jumped from 10.39% (n=8) in 2020 to 20.78% (n=16) in 2021, and later, to 23.38% (n=18) in 2022.

This abrupt increase contrasts strongly with the trend of stability or slight increase observed in previous years, indicating a possible failure or emerging challenge in local public health programs, which may have occurred as highlighted in some studies on the influence of Primary Health Care (PHC) on the incidence of diseases, which showed an

increase in CS rates, because there was greater attention to the prevention of specific diseases and hospitalizations to the detriment of actions to prevent CS7-9.

In addition, the incidence per 1000 live births also reflects this significant change, with an increase from 8.15 in 2020 to 16.82 in 2021 and 19.44 in 2022. This is worrisome, since the incidence of CS per 1000 live births in Brazil is 9.9. Thus, the data obtained show that the municipality of Crateús exceeded the Brazilian rate by 6.92 points (in 2021), making it an indication of alert for such infection in the territory. This concern should be further accentuated due to the higher increase than in 2021, which occurred in 2022.

These data were detected in the period of the COVID-19 pandemic, which began in 2020, showing that, due to the overload of the health system and its professionals in that period, there was initially a reduction in the number of people who sought medical care and performed prenatal care effectively. This caused an outbreak of cases when there was a decrease in the pressure caused by the pandemic in certain places, providing a considerable increase in the presentation of the disease in the years 2021 and 2022[10].

Thus, the failure of PHC continues to be the potential problem for the occurrence of CS, since, far beyond the application of prenatal treatment, PHC has to work analyzing the contamination of the sexual partners of mothers of children with CS, defining a major failure by failing to promote actions to raise awareness of these partners and avoid the problem presented[11, 12].

In addition, these peaks in incidence are alarming when compared to the lower rates in previous years. The return to normality in 2023 (5.51 cases/1000 live births) suggests an effective response to interventions carried out after peaks, but also raises questions about the sustainability of these interventions and the constant need for surveillance and adaptation of public health strategies. However, it is too early to define that cases will remain below the national average, because so far there are only data up to the 2023 period.

These observations point to the need to investigate the causes of the 2021 and 2022 peaks, assess the effectiveness of public health responses, and ensure the implementation of ongoing strategies that can prevent future fluctuations in the incidence of congenital syphilis. The effectiveness of prenatal care, as seen in the discussion of another table, shows high adherence, but the recent peaks in CS indicate that factors other than prenatal care[7,8,9,12,13] may be contributing to the increase in cases and need to be urgently addressed to protect the health of new generations.

Table 2 shows that prenatal policies were effective in reducing CS-related mortality rates, since in the municipality of Crateús, 97.40% (Table 2) of the children with the aforementioned disease had mothers who received prenatal care and 98.70% (Table 4) of them remained alive, and the only death, which represented 1.30% (Table 4), was caused in another way and not by CS.

Table 3 shows the age distribution of mothers of children diagnosed with congenital syphilis (CS) in the municipality of Crateús, with the 20 to 24 age group being the most prevalent, with 37.66% (n=29) of the mothers. This data suggests that young adults are the most affected, which is crucial for targeting public health programs and educational campaigns. The 15-19 and 25-29 age groups also show significant

proportions, with 23.38% (n=18) and 22.08% (n=17), respectively, while the 30-39 and 40-44 age groups have lower numbers.

These age patterns point to the need to focus intervention strategies on young adults and adolescents, promoting comprehensive sexuality education, easy access to contraceptive methods, and preventive screenings for syphilis. The predominance of cases among these younger age groups highlights the importance of awareness and prevention campaigns aimed at this group, aiming to reduce vertical transmission of syphilis and its adverse consequences for the health of mothers and babies[8,9,14].

Graph 2 shows another preponderant factor found during the studies, which is the low level of education of mothers with syphilis, with the first levels of school predominating, especially in the period from the 5th to the 8th grade of incomplete elementary school. From this, the low level of education of these mothers is noted, who often do not have previous knowledge about STIs, how to avoid them, and where to seek help for diagnosis and treatment[11,13,14].

In addition, Table 4 shows the prevalence of the brown population, with 67 cases of congenital syphilis confirmed in Crateús in the period analyzed. This fact can be explained, above all, by the historical socioeconomic marginalization of the brown population[15], which is responsible for the difficult access to information about this condition as well as to health, both in treatment and diagnosis, which is late in many cases, both for pregnant women and for their sexual partners, and thus contributes to the increase in the incidence of this STI, as well as in vertical transmission between mother and fetus[12,13,14,16].

In view of the information found, it was possible to verify that cases may vary between different regions, since access to health care is unevenly arranged in society, which leads to a probable increase in underreported cases, especially in the less favored socioeconomic classes[12,13,14,16].

This difficulty can be overcome with public policies to raise awareness among the population, favoring the understanding of this public in relation to the diagnosis, prevention and treatment of syphilis, especially in peripheral areas, where there is a higher prevalence of the brown population, the main segment affected by CS.

FINAL CONSIDERATIONS

What is important is the significant increase in CS cases between 2021 and 2022 and the subsequent reduction in 2023. This pattern suggests that recent interventions, potentially driven by public health policy and awareness campaigns, may be beginning to have an effect, although the need for continued vigilance is emphasized to sustain this downward trend.

The study stands out for its extensive use of longitudinal epidemiological data and detailed analyses of sociodemographic variables, offering a comprehensive overview of the dynamics of CS in the region studied. This survey provides a solid basis to guide future public health policies.

On the other hand, some limitations deserve to be highlighted. Reliance on notification data can lead to underreporting, hindering complete visibility of the issue. In

addition, the geographical limitation to the municipality of Crateús restricts the generalization of the findings to other regions.

In terms of prospects for future studies, it is crucial to explore the specific causes of the fluctuations observed in CS cases, including the analysis of potential gaps in access to early diagnosis and treatment. In addition, additional studies could investigate the impact of more detailed sociocultural and economic variables on CS incidence rates, as well as the effectiveness of different intervention models. These investigations would help to optimize prevention and control strategies adapted to the specific needs of the local population.

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