SÍFILIS CONGÊNITA NA AMAZÔNIA: DESVELANDO A FRAGILIDADE NO TRATAMENTO*

LA SÍFILIS CONGÉNITA EN LA AMAZONÍA: DESCUBRIMIENTO DE LA FRAGILIDAD EN EL TRATAMIENTO

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RESUMO

Objetivo: analisar a situação do tratamento inadequado da Sífilis Congênita (SC). Método: trata-se de um estudo misto, descritivo, com dados coletados no Sistema de Informação de Agravos de Notificação, no período de 2014 a 2017. Realizaram-se, adicionalmente, entrevistas semiestruturadas com os profissionais de saúde da Atenção Básica (AB), sendo os dados quantitativos estudados pela estatística descritiva, e os qualitativos, por meio da Análise de Conteúdo. Resultados: identificaram-se 61 recém-nascidos que receberam tratamento inadequado para SC. Entrevistaram-se enfermeiros da AB do município de Macapá atuantes nas áreas de abrangência das residências das crianças. Aponta-se que as análises das entrevistas permitiram a criação de três categorias: o saber do enfermeiro sobre a doença; a experiência do enfermeiro para a detecção de casos de SC na sua área de atuação; e as estratégias do enfermeiro para a busca de crianças com história de sífilis. Conclusão: evidenciou-se a fragilidade no tratamento da SC em Macapá com um alto índice de tratamento inadequado. Avalia-se que os perfis sociodemográficos e clínico das mães e crianças potencializam as vulnerabilidades individual, programática e social.

Descritores: Sífilis Congênita; Criança; Transmissão Vertical; Tratamento Farmacológico; Enfermagem em Saúde Comunitária; Saúde Pública.

ABSTRACT

Objective: to analyze the situation of inadequate treatment of Congenital Syphilis (CS). Method: it is a mixed, descriptive study with data collected in the System of Information on Disease Notification (SINAN), within the period from 2014 to 2017. In addition, semi-structured interviews were
carried out with health professionals from Basic Care (BC), with the quantitative data studied through descriptive statistics, and the qualitative data by means of Content Analysis. **Results:** 61 newborns who received inadequate treatment for CS were identified. Nurses from the BC of Macapá who work in the areas of the children's residences were interviewed. It is pointed out that the analysis of the interviews allowed the creation of three categories: the nurse’s knowledge on the disease; the nurse’s experience for the detection of cases of CS in his/her area of operation; and the nurse's strategies for the search of children with history of syphilis. **Conclusion:** the fragility in the treatment of CS in Macapá was evidenced with a high rate of inadequate treatment. The sociodemographic and clinical profiles of mothers and children are estimated to have enhanced individual, programmatic and social vulnerabilities.

**Descriptors:** Congenital Syphilis; Child; Vertical Transmission; Drug Treatment; Community Health Nursing; Public Health.

**RESUMEN**

**Objetivo:** analizar la situación de tratamiento inadecuado de la Sífilis Congénita (CS). **Método:** se trata de un estudio descriptivo mixto, con datos recogidos en el Sistema de Información de Enfermedades de Notificación, en el periodo de 2014 a 2017. Además, se realizaron entrevistas semiestructuradas con profesionales de la salud de atención primaria (AB), datos cuantitativos que se estudian mediante estadística descriptiva, y datos cualitativos, a través del análisis de contenido. **Resultados:** se identificaron 61 recién nacidos que recibieron tratamiento inadecuado por CE. Se entrevistó a enfermeras de AB en la ciudad de Macapá que trabajan en las áreas cubiertas por los hogares de los niños. Se señala que el análisis de las entrevistas permitió la creación de tres categorías: el conocimiento de la enfermera sobre la enfermedad; la experiencia del enfermero en la detección de casos de CS en su área de especialización; y las estrategias de la enfermera para encontrar niños con antecedentes de sífilis. **Conclusión:** se evidenció debilidad en el tratamiento del CS en Macapá con una alta tasa de tratamiento inadecuado. Se evalúa que los perfiles sociodemográficos y clínicos de madres e hijos potencian las vulnerabilidades individuales, programáticas y sociales.

**Descriptores:** Sífilis Congénita; Niño; Transmisión Vertical; Tratamiento Farmacológico; Enfermería en Salud Comunitaria; Salud Pública.

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Syphilis is an easily treatable Sexually Transmitted Infection (STI) which has a high risk of maternal-infantile infection in the gestational period. When there is inadequate or no treatment of the pregnant woman, the disease tends to evolve to Congenital Syphilis (CS). It is considered inadequate treatment for maternal syphilis: when it is performed with a drug other than penicillin; when it is incomplete for the stage of the disease, even if it has been done with penicillin; when the beginning or end of the treatment occurs in the 30 days before delivery; when there is no fall or elevation of the titles from the Venereal Disease Research Laboratory (VDRL) after appropriate treatment; when the partner is not treated, is treated inappropriately or the information about his treatment is not available. For children, failure to treat with penicillin at the recommended dosage and/or time is also defined as inappropriate.

CS is characterized by the result of the hematogenous dissemination of Treponema Pallidum from the infected pregnant woman to her conceptus via transplacental route, which can occur in any gestational phase or clinical stage of the maternal disease. Among the epidemiological factors associated with high risk for exposure of pregnant women to syphilis, the following stand out: missing or inadequate prenatal care; teenage pregnancy; use of illicit drugs; multiple sexual partners; history of sexually transmitted disease in the pregnant woman or sexual partner; low socioeconomic and cultural level. Therefore, CS stands out as an important indicator of the quality of maternal and child’s healthcare, exposing failures in prenatal care.

The diagnosis and treatment of CS become more difficult than that of maternal syphilis as they involve prolonged hospitalization and more costly and complex exams. The treatment must be carried out with medication, taking into consideration its effectiveness, safety, dosage, method of application, cost, adherence and availability.

According to the World Health Organization (WHO), in 2018 the detection rate of syphilis in pregnant women was calculated to be 21.4/1,000 live births, the incidence of CS was 9.0/1,000 live births and the mortality rate by CS was 8.2/100,000 live births. Despite the increase in reported cases, it should be noted that no Federation Unit (FU) presented an incidence rate of CS higher...
than the detection rate of syphilis in pregnant women, which may reflect the improvement in the reporting of cases of syphilis in pregnant women in the country.\textsuperscript{6}

The World Health Organization (WHO) estimate 1 million cases of syphilis per year amongst pregnant women worldwide.\textsuperscript{6} In Brazil, in 2018, 26,219 cases of CS were confirmed in under one-year-old children. Comparing the years 2009 and 2018, the incidence rate was pointed out to have increased by 333.96%, going from 2.1 to 9.0 cases per thousand born-alive children.\textsuperscript{7} In the state of Amapá, between the years 2014 and 2017, 211 cases of CS were detected. It is worth mentioning that the municipality with the highest incidence of cases was Macapá, with 159 confirmed cases.\textsuperscript{8} High rates of CS are pointed out to demand more effective preventive measures, such as control and adequate treatment of the disease, in addition to these strategies being systematically passed on among health professionals.\textsuperscript{9}

In 2017, the percentage of live births whose mothers had more than six prenatal consultations was observed to have been 39.3% in Amapá, the national average being 69.3%. It was found that the state of Amapá presented the lowest percentage among the states in the country, as well as the highest mortality rate (19.7) in under one-year-olds per thousand live births, against a national average of 12.4. In 2016, a ratio of 141.7 maternal deaths due to direct causes was identified per 100 thousand live births - the highest in the country.\textsuperscript{10}

Data from the Ministry of Health (MH) revealed that, in 2014, 68.5% of pregnant women with syphilis in Amapá had their diagnosis made in the 3\textsuperscript{rd} trimester of pregnancy, and in 2017, about 46.5% did it. The diagnosis of syphilis in the third trimester suggests late prenatal access, lack of diagnosis at the beginning of prenatal care, or a recent infection (first negative test at entry into prenatal care).\textsuperscript{7} These data point to failures in prenatal care in the state, since these exams should be available to pregnant women at the first prenatal visit (ideally, in the first trimester of pregnancy), at the beginning of the third trimester (28\textsuperscript{th} week), and at the time of delivery or abortion, regardless of previous exams.

Between the years 2014 and 2017, it is understood that there was a global crisis of penicillin shortages due to the fact that it is a patent-free product, as well as because it offers little profit to the few companies that produce it.\textsuperscript{11} Thus, many pregnant women were found to have been treated with erythromycin or ceftriaxone, or even to have gone untreated. The use of non-penicillin drugs is considered inadequate to avoid CS because they do not cross the transplacental barrier and do not treat the fetus.\textsuperscript{12}

It is verified that not all basic health units (BHU) in the state of Amapá administer benzathine penicillin, which can be a barrier to the treatment of pregnant women. The tests for syphilis in pregnancy are made available at the BHUs, but prenatal adherence occurs late. Difficulties have
also been found in the adherence by the sexual partner for the purpose of treatment. Women diagnosed at prenatal care, for fear of their partners' judgment and attitudes, have been noticed not to inform them about the results of the tests.\textsuperscript{13}

In this sense, among the measures involving the re-emergence of syphilis, the use of regional strategic studies that allow forms of intervention from the local reality by using the most varied methodological tools is highlighted. In order to focus on a sanitary practice consistent with the local reality, it is necessary to integrate the actions in the care of women with syphilis, based on a new paradigm characterized by attitudes such as listening, understanding and then meeting the demands of those women, thus encouraging the construction of a therapeutic path with autonomy, socialization of knowledge and reflection of actions to control the disease.\textsuperscript{14}

Given the importance of this issue, carrying out studies that contribute to the knowledge and understanding of the epidemiological dynamics of syphilis in the gestational period is justified, allowing a better planning of educational and preventive measures in the most vulnerable groups, as well as the evaluation of actions to reduce vertical transmission.

**OBJECTIVE**

To analyze the situation of inadequate treatment of Congenital Syphilis.

**METHOD**

This is a mixed, descriptive study, conducted in the municipality of Macapá, capital of the state of Amapá, northern region of the country, which extends over an area of 6,407 km\textsuperscript{2}, having in 2019 an estimated population of 503,327 inhabitants, being the 51st most populated municipality in Brazil and the fifth in the northern region.\textsuperscript{15} It is located in the southeast of the state, being the only Brazilian capital that does not have interconnection by highway to other capitals, located on the banks of the Amazon River and cut by the Equator line (Figure 1).
The study was conducted in two stages: firstly, data from the System of Information on Disease Notification (SINAN) were used, supplied by compulsory notification forms, which consist of standardized forms filled out by health professionals with sociodemographic and clinical information on patients. Only cases of congenital syphilis in residents of Macapá registered in the SINAN between January 2014 and December 2017 that met the definition criteria of confirmed cases according to the MH and that did not undergo the appropriate treatment were included (only the treatment with penicillin or with appropriate dosage, period and course as directed by the MH was considered appropriate). Duplicate cases identified by the SINAN analysis were excluded.

It is emphasized that the information collected from the forms supported the identification of the epidemiological profile of the mothers and children notified with the disease, in addition to identifying the area in which the mothers lived until the time of delivery.

Among the set of variables present in the notification forms, there were maternal sociodemographic characteristics such as: age; skin color or race (white, black, yellow, brown, indigenous or unknown); education level (illiterate, incomplete Elementary School, complete Elementary School, incomplete High School, complete High School, incomplete Higher Education, complete Higher Education or unknown); and clinical characteristics: having undergone prenatal (yes, no or unknown) and maternal syphilis diagnosis (during prenatal, at the time of delivery/curettage, after delivery or unknown). The age variable was adapted by age group: 14-19 years old, 20-29 years old, 30-35 years old, 36-40 years old and over 40 years old.

Among the analyzed variables of children's sociodemographic characteristics, there were listed: sex (male or female); skin color or race (white, black, yellow, brown, indigenous, unknown or unspecified); besides clinical characteristics - clinical diagnosis (asymptomatic, symptomatic or
unknown), treatment scheme done in the maternity hospital (other scheme or not done), and medication used when in another scheme (ceftriaxone, cefepime, other medications or not informed). Descriptive statistics was used in the analysis of variables of sociodemographic and mother-infant clinical profiles.

In the second stage of the survey, the study proposal was presented to the Health Surveillance Coordination, to the Syphilis Control Program Coordination and to the Family Health Strategy Coordination of the municipality of Macapá, as well as an invitation made to the participants in the survey. Later, reception took place involving health professionals who worked in the areas associated to the children’s addresses. Among the professionals who agreed to participate in the study by signing the Free and Informed Consent Form (FICF), a flow of actions involving planning the activities to be carried out for the active search of children and the outpatient follow-up was developed.

After data collection, a semi-structured interview of eight nurses was conducted by using the data saturation criterion, which occurs when new elements no longer appear in the collected data. In qualitative surveys, the identification of saturation is known as a determining criterion for interruption of data collection and definition of the sample size. The interviews, consisting of four open questions, were recorded with the consent of the participants. The interviews were held in the BHU where each nurse was based, except for two which were carried out in places chosen by the participants. The schedule was established according to each professional’s availability and the length of the interviews ranged on average between 20 and 30 minutes.

The information obtained from the interviews was transcribed and exhaustive readings were carried out. Then they were cut, grouped and coded. Each nurse was recorded to have received an identification code containing the letter “N”, initial for the word nurse, followed by a sequential ordinary number (N1 to N8) to maintain the anonymity of the participants. It is relevant to point out that these interviews had as main focus to know the previous information the nurses had about syphilis, about CS and about the strategies used for active search and monitoring of children in their areas of coverage.

For the data analysis process, the model proposed by Bardin was used, according to which the Content Analysis takes place in three stages: pre-analysis; exploration of the material; and treatment of the results and interpretation. The pre-analysis is pointed out as the moment to organize the material, formulate hypotheses or guiding questions and elaborate indicators that support the final interpretation. The exploration of the material is observed to consist of the codification, when the raw data are transformed in an organized way and aggregated into units. In the treatment and interpretation of the results obtained, the raw findings are verified to be treated in a
way so as to be meaningful and valid. Inferences and interpretations are then proposed in relation to the foreseen objectives or with respect to other unexpected discoveries.

It is noteworthy that the analyses of the interviews allowed the creation of three categories: the nurse’s knowledge about the disease; the nurse’s experience in the detection of cases of CS in his/her area of operation; and the nurse’s strategies in the search for children with a history of syphilis.

The discussion of the data was based on the literature pertinent to the subject. It is emphasized that the survey followed the recommendations of Resolution No. 466/2012 of the National Health Council which deals with surveys involving human beings, the opinion having been substantiated, signed and liberated by the Committee of Ethics in Research of the Federal University of Amapá on December 1st, 2017 under the number 2,410,045.

### RESULTS

61 children born between the years 2014 and 2017 in the municipality of Macapá were verified as not having received the drug of first choice (crystalline penicillin G) for the treatment of CS, which corresponds to about 40% of the cases of CS confirmed in that period in the municipality.

### Profile of the mothers and their children

Table 1. Sociodemographic and clinical characteristics of mothers with inadequate treatment for CS. Macapá (AP), Brazil, 2014-2017.

| Maternal Variables  | (n) | (%) |
|---------------------|-----|-----|
| **Age Group**       |     |     |
| 14 to 19 years old  | 13  | 21  |
| 20 to 29 years old  | 32  | 53  |
| 30 to 35 years old  | 10  | 16  |
| 36 to 40 years old  | 5   | 8   |
| Over 40 years old   | 1   | 2   |
| Total               | 61  | 100 |
| **Skin Color**      |     |     |
| White               | 4   | 6   |
| Black               | 3   | 5   |
| Brown               | 48  | 79  |
| Unknown             | 6   | 10  |
| Total               | 61  | 100 |
| **Education**       |     |     |
| Illiterate          | 1   | 2   |
| Children's Variables | (n) | (%) |
|----------------------|-----|-----|
| **Area of residence** |     |     |
| Urban                | 59  | 96,7|
| Rural               | 2   | 3,3 |
| Total               | 61  | 100 |
| **Sex**             |     |     |
| Female              | 30  | 49  |
| Male                | 31  | 51  |
| Total               | 61  | 100 |
| **Skin Color**      |     |     |
| White               | 4   | 6   |
| Black               | 3   | 5   |
| Brown               | 25  | 41  |
| Unknown             | 25  | 41  |
| Unspecified         | 4   | 7   |
| Total               | 61  | 100 |
| **Clinical Diagnosis** |   |     |
| During prenatal care| 20  | 33  |
| At the moment of delivery | 27 | 44 |
| After delivery      | 9   | 15  |
| Unknown             | 5   | 8   |
| Total               | 61  | 100 |

Source: SINAN/Division of Epidemiological Surveillance/Municipal Health Secretariat of Macapá (AP)

Table 2. Sociodemographic, clinical and therapeutic characteristics of children with inadequate treatment for syphilis. Macapá (AP), Brazil, 2014-2017.
Profile of health professionals

The professionals interviewed are known to work in the Basic Care (BC) of Macapá, females predominating amongst them. The age is understood to range between 34 and 50, and most of them (five nurses) had been working in BH for over ten years.

Category 1 - The nurse’s knowledge about the disease

In conceptual aspects, the participants were generally noticed to demonstrate knowledge of syphilis, of CS, and of the risks of transmission of the disease to the fetus when there is no adequate follow-up of the pregnant woman during prenatal care. Some of the consequences of CS were cited, as can be observed in their statements:

* It is a sexually transmitted infection that can happen in the woman or her partner and that can be transmitted to the child in the gestational stage [...] when the woman doesn’t do the treatment. (N7)

* [...] an untreated syphilis, it ends up leading to [...] blindness, deafness, I think it even leads to mental deficiency as well. (N4)

* The treatment we do according to the titration as well [...] We have penicillin in the posts, which are made available in three dosages. (N2)

### Treatment scheme carried out in the maternity hospital

| Category                  | Asymptomatic | Symptomatic | Unknown |
|---------------------------|--------------|-------------|---------|
|                           | 48           | 8           | 5       |
| **Total**                 | **61**       | **13**      | **8**   |

### Medication used when in another scheme

| Medication               |Dosages | Dosages |
|--------------------------|---------|---------|
| Ceftriaxone              | 12      | 22      |
| Cefepime                 | 29      | 53      |
| Other medications*      | 10      | 18      |
| Not informed             | 4       | 7       |
| **Total**                | **55**  | **100** |

Source: SINAN/Division of Epidemiological Surveillance/Municipal Health Secretariat of Macapá (AP)

* This information is not clear in the consolidated data.
The treatment of congenital syphilis is more complex because [...] it is carried out in the maternity hospital, sometimes [...] with procaine of 500 [...] in the period up to ten days [...] if it stops or if the mother is absent, it starts all over again. (N3)

Category 2 - The nurse’s experience in the detection of CS cases in their area of operation

It is remarkable that, when asked about the existence of children with CS in their area of coverage, most of the participants reported not knowing about recent cases.

[...] as for syphilis, the congenital one, we don’t have much contact [...] but there have been no reported cases in the last two to three years of these children with congenital syphilis. (N1)

[...] no, I had no information on children with syphilis in the past, at least not that I have seen, that I have assisted, that I know of, no. (N4)

It is observed that there is still a gap in some nurses’ knowledge in relation to the cases of CS in their area of coverage, which shows the lack of knowledge of the epidemiological profile of their patients. However, those who reported knowing about cases of CS in their area of coverage were identified, having described the way they came to their knowledge: by means of the Community Health Agent (CHA), of active search in the community, and of announcements by the Surveillance or Coordination of Syphilis, when there is notification.

I believe that I must have had altogether, counting this one of congenital syphilis, [...] about five during this time that I have been here. (N6)

If there is any case, usually the Surveillance or the Coordination of Syphilis, of STI, they always get in touch with us, because it is notified at the time of birth, then they already get in touch. (N2)

One of the cases was identified by the Community Health Agent. There is an active search within the area and also [...] we make the discovery of some cases in our area. (N2)

Category 3 - The nurse’s strategies for searching for children with a history of syphilis

It is pointed out that, regarding the strategies involving the search for children when a case of CS is informed in the area covered by the STI Epidemiological Surveillance, most nurses count on the CHA to make the active search, only one participant having informed that she tries to compare with the reports and exams in the medical record, as it can be observed in the following two statements:

Well, the strategy is to go to the house anyway [...] to go soon, to see, investigate and bring this mother here, so that we can see what it was, if it was treated, just to do all that inves-
tigation, that clinical consultation, both the baby and the mother, as well as the partner, and do this follow-up. The main thing is this, to go to the house. (N5)

First, the medical record, […] to evaluate what happened during this prenatal care, if we detected it, if she abandoned it or if we didn't even have this information […] then make the search, if this child had the childcare consultation, yeah, and finally make the home visit, active search in loco, with the help of the CHA. (N6)

DISCUSSION

The predominance of young mothers in the age group of 20 to 29 years old, brown-skinned, with incomplete Elementary Education is observed. Additionally, more than half underwent prenatal care, but screening for syphilis at delivery was registered in only 44% of the cases. A predominance of CS diagnosis in children living in the capital under study is detected. From the children's variables, it was observed that there was no difference regarding sex. Prevalence of 41% for brown skin and for unknown item is added. Most clinical diagnoses were verified as asymptomatic, having undergone another type of treatment for CS, prevailing the use of cefepime and ceftriaxone.

The number of notifications of CS within the surveyed aspects was pointed as predominant in the urban area of Macapá. Similar data were found in a study that described cases of CS and gestational syphilis in Brazilian municipalities in relation to the access profile to prenatal care in the years 2003 to 2008. This study indicated that, in 2008 alone, 5,541 cases of CS were reported in 897 municipalities, among which 87% to 90% of the cases were urban area residents.18

In this survey, it is understood that the maternal epidemiological profile covered the age range from 20 to 29 years old, the group that presented the highest risk of acquiring the infection during pregnancy. This can be explained by the vulnerability of the population of young adults who are more exposed to sexually transmitted diseases, since it is a phase of age, emotional and cognitive maturation with neglected contraceptive use either to avoid an unplanned pregnancy or to prevent sexually transmitted infections (STIs).19

Characteristics such as race/skin color and low level of education are observed as variables demonstrated by several studies to be associated with gestational syphilis. This is notably the profile of individuals with less privileged socioeconomic conditions and with less access to quality health care.20 The education variable stands out, considered a marker of higher risk for the exposure to STIs due to a limited understanding of the importance of preventive measures.

It is important to emphasize that although the risk is higher in the most vulnerable populations, it is not an exclusive condition of this group, since, regardless of social or economic conditions, everyone can acquire the infection.21
As far as prenatal care is concerned, most women were found to have undergone it, but the diagnosis of maternal syphilis occurred mostly at the time of delivery. CS is defined as a sentinel event of prenatal quality, the lack of it being inversely proportional to the rates of infant death, miscarriage and stillborns due to the disease.\textsuperscript{18-21}

These correlations reinforce the hypothesis that CS is a predictor of prenatal quality, revealing the precarious conditions of maternal and child health care in Brazil.\textsuperscript{22} Several conditioning and determining factors for adequate prenatal care can be listed, such as gestational age at the beginning of prenatal care, number of appointments, conducting routine exams, among others.\textsuperscript{19} It is known that there are pregnant women without any follow-up or prenatal appointment who constitute a population who is highly vulnerable to the prevalence of syphilis in pregnancy.\textsuperscript{22}

The elimination of CS is noted to be based on quality prenatal care, attending what is recommended by the MH, with improvement of diagnostic means. It is pointed out that, based on the aforementioned assumptions in this survey regarding diagnosis, a study that investigated the cases of CS and maternal syphilis in Montes Claros, Minas Gerais also indicated the late discovery of the disease, since out of 93 pregnant women investigated, 62.4\% discovered the disease at the time of delivery or curettage.\textsuperscript{23}

It is argued that congenital syphilis is an easily preventable disease when there is early access to prenatal testing and appropriate treatment of positive pregnant women, including treating their partners. It is emphasized that the policy for the prevention of maternal-infant mortality includes targets for reducing vertical transmission of syphilis. To this end, the MH is indicated to have been conducting the implementation process by means of the Stork Network program in their prenatal component, aiming to guarantee the offer of rapid testing for syphilis screening in the admission or first appointment of the pregnant woman in the BHS.\textsuperscript{24}

Due to the low detection of CS during prenatal care, it has been suggested that the procedure has not been effective for the diagnosis of syphilis. Among the factors that may have influenced this situation are the lower than recommended number of prenatal appointments, failure to conduct tests, delay of laboratories in delivering results, as well as the failure of health services to rescue pregnant women who have abandoned prenatal care.\textsuperscript{21} Therefore, controlling syphilis cases through early detection, proper case management, including partner treatment and use of a condom is considered the most viable way of regression of the disease, besides being fundamental for the prevention of new cases, thus avoiding harmful consequences to children.\textsuperscript{25}

It is believed that children with congenital syphilis should be investigated while still in the maternity hospital for clinical manifestations, complementary tests and non-treponemal test results. It is worth mentioning that regardless of the history of the maternal treatment, NBs with a
non-treponemal test result higher than that of their mothers in at least two dilutions (e.g.: mother 1:4 and NB ≥1:16) are considered cases of CS and should be notified, investigated, treated and followed up as for clinical and laboratory aspects. For the diagnosis of syphilis, a treponemal and a non-treponemal test should be applied. Considering the sensitivity of diagnostic flows, it is recommended, whenever possible, to start the investigation with a treponemal test (quick test, FTA-Abs, ELISA, among others).

Regarding the characteristics of the children in the study in question, it should be reinforced that there was no difference as to sex, and the skin color was either ignored or not specified. As for the clinical characteristics of the children investigated, most were registered as asymptomatic at birth, which also ratified the results of a study conducted in six public hospitals in the Federal District, where out of 81 children notified for CS, 71.6% were asymptomatic at birth.

It is important that the evaluation of suspected cases of CS is carried out in a thorough and safe manner, because even with the therapeutic protocols and medications made available by the MH, health services continue to provide precarious assistance to NBs with CS. This aspect is exemplified by the use of other antibiotics for the treatment of the disease in children, such as cefepime and ceftriaxone, which were the most prevalent medications in this study. However, it should be alerted that the MH recommends the use of ceftriaxone only in the unavailability of crystalline or potassic penicillin G, since there is no scientific evidence of the effectiveness of that drug in the treatment of CS.

During the study period and as a result of the global and the country's shortage of penicillin, it was verified that the MH issued Joint Information Note No. 68/2016, which oriented the treatment of CS and neurosyphilis in NBs during the period of unavailability of crystalline penicillin and procaine. In this recommendation, ceftriaxone was informed to be the only drug recommended as a therapeutic option in the absence of penicillin, and when treatment with ceftriaxone was conducted, there should be a more rigorous clinical and laboratory follow-up until therapeutic success was achieved.

In this study, 61 children from the municipality of Macapá who were born between 2014 and 2017 were found not to have been given the drug of first choice for the treatment of CS - crystalline penicillin G, which is the only drug capable of curing syphilis. It is known that to eliminate syphilis, health professionals and managers must be committed to treating cases of the disease, and it is also important that the professionals have knowledge about the disease, as well as mastery of the proper management of cases.

It is to be emphasized that the absence of a doctor in the BHU is not a reason for the lack of timely administration of benzathine penicillin by nursing professionals in BC. With regard to the
professionals’ knowledge about CS, it was found through the interviews in this study that the participants knew about the disorder but were unaware of the existence of cases in their area of coverage.

It was also found that the nurses relied only on the CHA as an active search strategy in the community, an action that could be expanded through the Health Surveillance service of the municipality to be informed about any suspicious case, through the information systems of notification or laboratory results.

Regarding the characteristics of the health professionals interviewed, it is observed that there was a predominance of females with ages ranging between 34 and 50 years old, having worked in BC for over ten years. Such characteristics were found in other studies in which most participants were female, with a degree in Nursing and practicing in BC for more than ten years.29

Knowledge of the risks of transmission of the etiological agent of syphilis to the child during pregnancy with inadequate treatment is highlighted to having been unanimous among the participants. Similar findings were revealed in a study with 55 nurses from BC conducted in Piauí, where 74.6% knew the risks of vertical transmission of Treponema Pallidum to the fetus during any gestational stage.30 The same study shows that the professional nurses know the CS prevention manual and the syphilis treatment according to its stage.30 Nonetheless, knowing about the disease is not enough, being necessary to make use of the epidemiological situation within their region so that monitoring strategies for the specific target public can be set up.

The results of this survey show that the nurses interviewed were unaware of recent cases of CS in their area of coverage, a fact that other authors also addressed in their study, in which 89.1% of the nurses reported not to know about reported cases of CS in their community.30

Only two nurses were specified to reporting knowledge of recent cases of CS in their community, and, in their statements, it was possible to observe that the cases have reached them through an announcement or notification by the Health Surveillance, the STI coordination of the municipality or when the CHA identifies cases in the community. As for strategies of searching for CS cases in the community, it is noticeable that the results of this study reveal that the CHA is fundamental in this process and has a role in the reception, since he/she is a member of the team that is part of the assisted community, which allows the creation of bonds, providing direct contact with the team.

It is understood that some limitations of this study are related to inadequate treatment information obtained exclusively through notification forms. It is known that there are gaps in the completion of the forms and in completing the consolidated data in the local notification system.
There was no access to professionals providing healthcare in the state hospital network because they were not part of this study.

**CONCLUSION**

This study has highlighted the fragility of the treatment of CS in the municipality of Macapá (AP), with a high percentage of inadequate treatment, revealing failures in the capacity of services to reduce vertical transmission, in the diagnosis and treatment of pregnant women and partners, as well as in the follow-up and monitoring of children.

Failures in the capacity to identify and report CS cases were also verified. The lack of knowledge by the professionals regarding the protocols established by the MH was revealed, as well the fragility in health management in the provision of first choice medications, in the reference and counter-reference of newborns with the pathology, and in the low coverage of the Family Health Strategy (FHS).

By associating this context with the sociodemographic and clinical profile of mothers and children, it can be inferred that the latter present individual, programmatic and social vulnerability. Therefore, it can be concluded that the commitment of health professionals and managers is necessary to strengthen the proposed actions as fundamental organizational guidelines in the municipality BA work process.

**CONTRIBUTIONS**

All authors have contributed equally to the conception of this research project, collection, analysis and discussion of data, as well as in the writing and critical review of the content with intellectual contribution and in the approval of the final version of the study.

**CONFLICT OF INTERESTS**

Nothing to declare.

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