

Maternal and congenital syphilis, underreported and difficult to control

Sífilis materna e congênita, subnotificação e difícil controle

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ABSTRACT: *Objective:* To identify and to describe cases of congenital and maternal syphilis reported and not reported in a Brazilian medium-sized city. *Methods:* This is a descriptive and retrospective study, which evaluated 214 medical records of pregnant women and newborns. It began with the identification of epidemiological notification records, followed by active search in maternity evaluating all records that did show positive nontreponemal serology and records of the reference service in infectious diseases in Montes Claros, Minas Gerais, from 2007 to 2013. The case definitions followed the Ministry of Health recommendations in Brazil and the variables were described using absolute and relative frequencies. This study was approved by the Ethics in Research Committee (University State of Montes Claros). *Results:* Of the 214 medical records, we identified 93 cases of maternal syphilis and 54 cases of congenital. The women studied were predominantly mulatto, with Secondary/Higher, aged between 21 and 30 years and single marital status. Considering the prenatal care of pregnant women with syphilis, it was observed predominance of late diagnosis, after parturition or curettage, and all of their treatments were considered inadequate according the Ministry of Health. The newborns of pregnant women with syphilis, most were not referenced for pediatric follow-up. Only 6.5% of syphilis in pregnant women was notified, and in congenital syphilis, 24.1%. *Conclusion:* Persisting vertical transmission, there are signs that the quality of prenatal and neonatal care should be restructured.

Keywords: Pregnancy. Syphilis. Congenital syphilis. Prenatal care. Public health. *Treponema pallidum*.

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RESUMO: *Objetivo:* Identificar e descrever casos de sífilis congênita e materna notificados e não notificados em uma cidade brasileira de médio porte. *Métodos:* Trata-se de estudo descritivo e retrospectivo que avaliou 214 prontuários de gestantes e recém-nascidos (RNs). Iniciou-se com identificação das fichas de notificação epidemiológica, seguida de busca ativa nas maternidades, avaliando-se todos os prontuários que apresentavam sorologia não treponêmica positiva e prontuários do serviço de referência em infectologia, na cidade de Montes Claros, Minas Gerais, no período de 2007 a 2013. As definições de casos seguiram as recomendações do Ministério da Saúde (MS) no Brasil e as variáveis foram descritas utilizando-se frequências absoluta e relativa. Estudo aprovado pelo Comitê de Ética em Pesquisa (Universidade Estadual de Montes Claros). *Resultados:* De 214 prontuários avaliados, foram identificados 93 casos de sífilis materna e 54 casos de sífilis congênita. As gestantes analisadas foram, predominantemente, de cor parda, apresentando ensino médio/superior, com faixa etária entre 21 e 30 anos e estado civil solteira. Considerando acompanhamento pré-natal das gestantes com sífilis, observou-se predomínio do diagnóstico tardio, após o parto ou a curetagem; a totalidade dos respectivos tratamentos foi considerada inadequada, segundo o MS. Dos RNs de gestantes com sífilis, a maioria não foi referenciada para acompanhamento pediátrico. Apenas 6,5% dos casos de sífilis em gestantes foram notificados; em relação à forma congênita, esse valor foi de 24,1%. *Conclusão:* Persistindo a transmissão vertical, verificam-se sinais de que a qualidade da atenção pré-natal e neonatal deve ser reestruturada. *Palavras-chave:* Gravidez. Sífilis. Sífilis congênita. Cuidado pré-natal. Saúde pública. *Treponema pallidum*.

INTRODUCTION

Syphilis is a systemic infectious disease caused by the spirochete *Treponema pallidum*, of chronic and often asymptomatic evolution, whose main forms of transmission are sexual and vertical^{1,2}. It can be acquired and congenital, which requires compulsory notification since the release of Decree n° 542/1986 and the maternal form since 2005^{2,3}. The acquired form of syphilis is divided into early and late, depending on the duration of infection and degree of infectivity. Congenital syphilis presents itself differently; from asymptomatic in 70% of cases to more severe forms^{1,4,5}.

Worldwide, syphilis is a reemerging infection, as seen in Italy and in the United States. It is necessary to monitor all pregnant women during prenatal care and provide treatment as soon as possible to avoid the congenital infection^{6,7}. Latin American, African, and Asian countries have high incidence and are focused on controlling the prenatal care^{8,9}.

In Brazil, according to the Ministry of Health, every year 50,000 pregnant women are diagnosed with syphilis, with prevalence ranging from 1.1 to 11.5%, depending on prenatal care and maternal schooling. The result is that, per year, approximately 12,000 newborns (NBs) have congenital syphilis^{1,10}. The control of syphilis in Brazil is a part of the goals of the Pact for Health, as the World Health Organization (WHO) projects the elimination of congenital syphilis until 2015². Even with this projection, in various regions of Brazil, there are studies that verify the difficulties to control this infection. In Ceará, the difficulty in treating the sexual partner culminates with inadequate treatment¹¹.

In Belo Horizonte and Belém do Pará, the prevalence of young people with absent or incomplete prenatal care is clear^{12,13}.

These indicators suggest the low quality of prenatal care in the country and the lack of interest on the part of health professionals in the diagnosis and treatment of the disease^{11,12,14-18}. A study conducted among health-care workers in the city of Rio de Janeiro indicates a lack of knowledge and familiarity with regard to national protocols of syphilis control, as well as the difficulty to approach sexually transmitted diseases (STDs), showing the need for continuing education to improve assistance¹⁹.

Congenital syphilis is considered, in epidemiological terms, an indicator of the quality of prenatal care in a population^{20,21}, to ensure that all pregnant women have adequate access to prenatal care^{20,22,23}. Appropriate treatment of infected pregnant women is the best method of preventing congenital syphilis^{1,2,4,24-26}.

Syphilis, in congenital and maternal form, requires mandatory reporting by health professionals, as its failure violates health legislation. But even so, underreporting is common, as seen in studies in Palmas (TO) and in the State of São Paulo, where an active search found three times as many cases, in comparison with the reported ones^{5,27,28}.

Considering the impact of congenital syphilis in public health care and the need for its control, this study investigated cases of reported and unreported congenital and maternal syphilis in the city of Montes Claros, northern Minas Gerais, to identify vulnerable points in the obstetric and neonatal care.

METHOD

This retrospective and descriptive epidemiological study investigates reported and unreported cases of congenital and maternal syphilis in the city of Montes Claros, northern Minas Gerais, from January 2007 to July 2013. The municipality is a health macro-regional reference in the state, covering a total of 361,915 inhabitants (Brazilian Institute of Geography and Statistics – IBGE, 2010), providing maternal and child care through three public hospitals, two of which are high risk and one is of usual risk. For this study, we considered maternal and congenital syphilis cases, according to the MS recommendations².

Maternal syphilis: if there is clinical evidence of the disease and/or nontreponemal serological reagent (with no titration), even in the absence of results of treponemal test, carried out in prenatal, during delivery, or curettage. Congenital syphilis:

1. every child, miscarriage, or stillbirth of mother with clinical or serologic evidence of syphilis that has not been treated or has received inadequate treatment;
2. children under the age of 13 with serologic evidence of syphilis, if not considering the possibility of maternal antibodies and acquired syphilis;
3. children under 13 with nontreponemal serological reagent for syphilis and clinical, radiological, or cerebrospinal fluid evidence for congenital syphilis; or
4. microbiological evidence of the presence of *T. pallidum* in the placenta, umbilical cord, or tissue of the child, an abortion, or stillbirth product².

The report forms of the Notifiable Diseases Information System (SINAN) totaled in 6 cases of maternal syphilis and 13 of the congenital form. Suspecting of underreporting, we went to actively search in three public maternity hospitals in Montes Claros (MG), through positive nontreponemic serology for all patients admitted and posterior search on pediatric infectious diseases service, during the same period. We identified 214 records diagnosed with syphilis, and from the exclusion criteria, we accounted 93 cases in pregnant women and 54 cases in NBs. The pregnant women notifications were not coincident with the NBs, and the notified cases were included.

Male adults, women outside the pregnancy cycle, residents in other municipalities and coincident cases (repeated cases seen in different locations), pregnant women, or NB reported and attended at these hospitals were excluded.

The description of the variables was performed using the absolute and relative frequencies. The variables analyzed were the number of appointments, schooling, pregnant treatment, marital status, age, and early prenatal and gestational age at diagnosis. To investigate the association between maternal characteristics and congenital infection of NBs, χ^2 and Fisher tests were used, assuming a 5% significance level. For this analysis, the variables were dichotomized as follows: number of appointments (six or more, less than six/unrealized), education (illiterate/primary, secondary/higher education), pregnant woman's treatment (yes/incomplete, unrealized), marital status (married/common-law marriage, single), age (< 20 years, \geq 20 years), beginning of prenatal care (1st trimester, late/unrealized), and gestational age at diagnosis (1st trimester, late/unrealized). The collected data were analyzed using the statistical program SPSS®, version 19.0 for Windows.

The study was authorized by the participating institutions and approved by the Research Ethics Committee of UNIMONTES with opinion n° 226-740.

RESULTS

Considering pregnant women, we noted that most of them (44.1%) had incomplete high school education up to university degree. With regard to skin color, 63.4% were self-reported as brown. The predominant age group was between 21 and 30 years (50.5%), and the marital status was single (53.8%) (Table 1); all reported cases were found in other sources of information.

According to the analyzed characteristics of prenatal care (Table 2), we noted that 43% of women diagnosed with syphilis attended a minimum number of six appointments; approximately half of the cases (48.4%) managed to start monitoring in the first trimester of pregnancy. However, most women had late diagnosis at birth or curettage (62.4%) and, yet, no cases have been considered adequately treated according to the Ministry of Health recommendations. A total of 33.3% of pregnant women had not received any treatment, and all of them were considered improperly treated, particularly because of non-partner treatment (98%). In this sample, there is a gradual increase

in the number of cases, both among pregnant women and among NBs that were examined over the years.

Considering the characteristics of NBs in pregnant women with positive VDRL, 25.8% were not tested for syphilis, 27.9% of the results were positive, 23.7% negative, and 16.1% progressed to abortion or stillbirth; still, in 6.5% of cases there was no information about the examination. With regard to other complementary tests for investigation (blood test, x-ray of long bones, and examination of cerebrospinal fluid), 45.2% of cases had no such examination (Table 3).

With regard to the characteristics of the 54 NBs with congenital syphilis, only 51.8% were treated as directed. A total of 88.9% were asymptomatic, the majority (88.8%) had no coinfection, and 77.8% maintained adequate weight for gestational age – AGA. As for the pediatric reference service, 79.6% were not even referenced (Table 4). No cases of coinfection with HIV / AIDS were recorded.

Table 1. Sociodemographic characteristics of pregnant women with syphilis in the municipality of Montes Claros (MG), 2007 – 2013.

Characteristic	n	%
Schooling		
Illiterate/elementary school	37	39.8
Secondary/higher	41	44.1
Not informed	15	16.1
Skin color		
White	15	16.1
Brown	59	63.4
Yellow	1	1.1
Black	7	7.5
Not informed	11	11.9
Age group (years)		
11 to 20	17	18.3
21 to 30	47	50.5
> 30	29	31.2
Marital status		
Married/common-wealth union	35	37.6
Single	50	53.8
Not informed	8	8.6
Total	93	100.0

Table 2. Characteristics of prenatal monitoring of pregnant women with syphilis in Montes Claros (MG), 2007 - 2013.

Characteristic	n	%
Number of appointments		
≥ 6	40	43.0
< 6	28	30.1
Unrealized	20	21.5
Not informed	5	5.4
Beginning of prenatal care		
First trimester	45	48.4
Second/third trimesters	24	25.8
Unrealized	20	21.5
Not informed	4	4.3
Gestational age at diagnosis		
1 st trimester	10	10.7
2 nd /3 rd trimesters	21	22.6
After birth/curettage	58	62.4
Not informed	4	4.3
Pregnant women's treatment		
Yes, inadequate/incomplete	62	66.7
No	31	33.3
Total	93	100.0

Table 3. Additional tests performed on newborns of pregnant women with syphilis in Montes Claros (MG), 2007 - 2013.

Exams	n	%
Nontreponemal test (VDRL)		
Positive	26	27.9
Negative	22	23.7
Unrealized	24	25.8
Does not apply (abortion, stillbirth)	15	16.1
Not informed	6	6.5
X-ray of long bones, cerebrospinal puncture, blood count		
At least one positive	4	4.3
All negative	26	27.9
Unrealized	42	45.2
Does not apply (abortion, stillbirth)	15	16.1
Not informed	6	6.5
Total	93	100.0

Table 5 shows the association of congenital infection and maternal variables. There was no statistically significant association between the variables studied and the reduction of congenital infection. Still, among the infected NBs, there are more pregnant women who did not undergo treatment (35.2%) and most had late diagnosis (92.6%), whereas among the uninfected 19.0% did not undergo any treatment, and 77.8% had late diagnosis, with no differences between reported and unreported.

Table 4. General characteristics of newborns with congenital syphilis in Montes Claros (MG), 2007 - 2013.

Characteristic	n	%
Treatment		
Yes	28	51.8
No	23	42.6
Not informed	3	5.6
Altered physical exam		
Yes	4	7.4
No	48	88.9
Not informed	2	3.7
Coinfections		
Yes	3	5.6
No	48	88.8
Not informed	3	5.6
Weight when born		
AGA	42	77.8
SGA	7	12.9
LGA	4	7.4
Not informed	1	1.9
Pediatric outpatients		
Attended first appointment	4	7.4
Returned to second appointment	1	1.9
Unreferenced	43	79.6
Referenced, but did not attend	6	11.1
Total	54	100.0

AGA: adequate for gestational age; SGA: small for gestational age; LGA: large for gestational age.

DISCUSSION

The goal of eliminating congenital syphilis by 2015, as proposed by the WHO, and of control established by the MS in Brazil, is far from being achieved. The underreporting is one of the biggest barriers^{5,11}. In this study, only 6.5% of cases of maternal syphilis and 24.1% of congenital cases were reported, reflecting the weakness of the national public health system.

Table 5. Comparison of maternal characteristics between infants with and without congenital infection in Montes Claros (MG), 2007 - 2013.

Characteristic	Infected	Not infected	p-value*
	n (%)	n (%)	
Number of prenatal appointments			
≥ 6	27 (50.9)	13 (65.0)	0.282
< 6/not attended	26 (49.1)	7 (35.0)	
Schooling			
Illiterate/elementary school	27 (51.9)	12 (63.2)	0.400
High school/college	25 (48.1)	7 (36.8)	
Pregnant women's treatment			
Yes/incomplete or inadequate	35 (64.8)	17 (81.0)	0.174
No	19 (35.2)	4 (19.0)	
Marital status			
Married/stable union	21 (40.4)	10 (52.6)	0.357
Single	31 (59.6)	9 (47.4)	
Age group (years)			
< 20	6 (11.1)	1 (4.8)	0.396
≥ 20	48 (88.9)	20 (95.2)	
Beginning of prenatal care			
1 st trimester	30 (56.5)	13 (68.4)	0.368
Late or not done	23 (43.5)	6 (31.6)	
GA of the diagnostic			
1 st trimester	4 (7.4)	4 (22.2)	0.083
Late/maternity	50 (92.6)	14 (77.8)	
Total	54 (100.0)	21 (100.0)	

* χ^2 test or Fisher test; GA: gestational age.

Maternal and congenital syphilis need to be prevented and controlled; however, it is hard to establish a risk group for the disease. Some studies describe the most common features in this population, such as predominance of black and brown color, less than 8 years of schooling, age of 20 to 29 years, beginning of early sexual activity, and single marital status^{12,14,17,18,29}. Guinsburg and Santos¹⁶ referred to the low socioeconomic status, use of drugs, and dropping out of school as associated factors, while Almeida et al.³⁰ found a new profile of infected women with higher education (more than 8 years of schooling), married, and reporting only one sexual partner. This work observed, unlike some Brazilian studies, predominance of women with more than 8 years of schooling; still, the majority was brown, aged 21 to 30 years, and single. The data from this study corroborate that syphilis, like other STDs, does not affect only one specific risk group, and should be key to prevention for the general population³¹.

The difficulty in preventing vertical transmission remains the obstacle of diagnosis and of early and appropriate treatment. According to Araújo et al.¹⁴, most pregnant women attended prenatal care, but even so, 38% were only diagnosed with syphilis at birth or curettage. According to Rodrigues and Guimarães¹², up to 40% progressed to this loss. Studies also demonstrate these results, with the completion of prenatal care as recommended, but with the nonrealization of screening tests, showing the difficulty of diagnosis and treatment^{11,15,16,18,22,32}. In this study, it became clear that most women, who attended the recommended minimum six prenatal care visits, starting in the first trimester, still had late diagnosis.

In this study, no concomitant case with HIV/AIDS was found. However, according to Sanz and Guinsburg in a study in Pará, coinfection is present and growing, higher rate among young, poorly educated, with one sexual partner, and without the use of condoms¹³.

The appropriate treatment of pregnant women is done with penicillin and has to be completed 30 days before delivery, using medication according to the stage of disease. The sexual partner needs to be properly medicated simultaneously¹. Inadequate treatment is extremely common, as seen in this work and several previous studies^{11,15,16,18}, and its main cause is related to the treatment of partners of pregnant women. A study by Campos et al.³³ investigated the reason for not treating partners and found that they were informed about the disease and but they simply did not follow the treatment, because of a cultural issue regarding men being sick. In this work, only one partner was oriented as described in the medical record, but no pregnant woman was considered adequately treated. There should be information available on the treatment of these partners².

All NBs of pregnant women with syphilis should be screened for congenital syphilis. In cases of pregnant women treated properly, only a nontreponemal test (VDRL) in NB is realized; if negative, the infant needs to be followed up. When this is not possible, a treatment with a single dose of penicillin G benzathine is required. In other cases, it is necessary to perform research with VDRL, blood tests, X-rays of long bones, and cerebrospinal fluid analysis, and treatment should be according to the results of these tests. The pediatric follow-up should be carried out monthly until the 6th month of life and then every 2 months until the first year. VDRL should be done every 3 months, specialized monitoring (ophthalmic, neurological, and audiological) and examination of cerebrospinal fluid every 6 months, until normalized¹.

According to Magalhães et al.³² in an assessment conducted in the federal district, approximately half of NBs held radiograph of long bones and examination of cerebrospinal fluid, and all the mothers were considered inadequately treated. This work also found that in 25.8% of NBs of pregnant women with syphilis did not perform VDRL, and nearly half did not perform any other tests. Of the NBs surveyed, most received no treatment and were asymptomatic, and 16.1% progressed to stillbirth or abortion, corroborating other studies^{4,5,7}.

Only through a united effort, with a qualified prenatal assistance, laboratory tests in a timely manner, couple treatment, and awareness of everyone involved, it is possible to achieve the desired objective to control this infection^{6,19,31,34-37}. It is important to use the Family Health Strategy to approximate the population, knowing that it is one of the main gateways to health services. Also, community health workers need to actively search for pregnant women, to invest in continued education³⁸. When this becomes reality, we will start to meet the 1948 resolutions of the United Nations (UN) and WHO and, in fact, will improve the health of women and children. Proper treatment of syphilis in pregnancy is the only way to prevent the vertical transmission and therefore the congenital infection³⁹.

Some limitations of this study should be noted, such as the use of secondary data, the quality of information from medical records, and the use of different sources of research that make it difficult to collect all the information.

CONCLUSION

The reality of maternal and congenital syphilis in the city of Montes Claros (MG) is far from ideal, which would be the control of the disease. The results show underreporting, an increasing number of cases in pregnant women, and the persistence of vertical transmission; thus, showing the lack of a syphilis control policy in the city.

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