Congenital infections (syphilis and human immunodeficiency virus) in a federal hospital in Rio de Janeiro

Infecções congênitas (sífilis e vírus da imunodeficiência humana) em hospital federal no Rio de Janeiro

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ABSTRACT

Introduction: Congenital infections are related to a higher risk of morbidity and mortality in the neonatal period and can cause serious complications in the newborn. Among the sexually transmitted infections (IST) present in this group, syphilis and vertical exposure to the human immunodeficiency virus (HIV) are still a challenge in the 21st century. **Objective:** To evaluate the prevalence of congenital syphilis and exposure to HIV among congenital infections. **Methods:** Cross-sectional, analytical study with data collected from medical records of newborns admitted to the Conventional Neonatal Intermediate Care Unit, Kangaroo and Joint Accommodation, in the database of the service of the Federal Hospital from Bonsucesso, from January 2015 to December 2018. **Results:** During the study, 2,202 newborns were discharged from the hospital and 474 were positive for congenital infection (21.8%). In cases of congenital infection, congenital syphilis (398–84%) and maternal HIV infection (40–8,4%) were the most frequently encountered clinical situations. The relationship between prenatal care and the absence of congenital infection was evident. Among the newborns, 117 (5.3%) were premature, 352 (16.3%) were older than 37 weeks and 95 (23.7%) had low birth weight. **Conclusion:** Congenital infection was one of the main causes of neonatal morbidity; syphilis and HIV had the highest prevalence, being associated with reducible deaths when adequate care is provided for women during pregnancy. Perinatology services demand a great effort in order to manage these avoidable and undesirable situations.

Keywords: infant, newborn; pregnancy; infectious disease transmission, vertical; syphilis; HIV.

RESUMO

Introdução: As infecções congênitas estão relacionadas a um risco mais elevado de morbimortalidade no período neonatal e geram sérias complicações no recém-nascido. Dentre as infecções sexualmente transmitidas (IST) presentes nesse grupo, a sífilis e a exposição vertical ao vírus da imunodeficiência humana (HIV) ainda são um desafio em pleno século XXI. **Objetivo:** Avaliar a prevalência da sífilis congênita e exposição ao HIV entre as infecções congênitas. **Métodos:** Estudo de corte transversal e analítico, com dados coletados nos prontuários de alta dos recém-nascidos que ficaram internados na Unidade de Cuidado Intermediário Neonatal Convencional, Canguru e Alojamento Conjunto, no banco de dados do Serviço do Hospital Federal de Bonsucesso, de janeiro de 2015 a dezembro de 2018. **Resultados:** No período do estudo, 2.202 recém-nascidos receberam alta hospitalar e 474 apresentaram positividade para infecção congênita (21,8%). Nos quadros de infecção congênita, a sífilis congênita (398–84,0% dos casos) e a infecção materna pelo HIV (40–8,4%) foram as situações clínicas mais frequentemente encontradas. Ficou evidente a relação entre a realização do pré-natal e a ausência de infecção congênita. Desses recém-nascidos, 117 (5,3%) foram prematuros, 352 (16,3%) tinham mais de 37 semanas e 95 (23,7%) tinham peso abaixo de 2.500 g. **Conclusão:** A infecção congênita foi uma das principais causas de morbidade neonatal; a sífilis e o HIV tiveram as maiores prevalências, estando associados às mortes redutíveis por adequada atenção à mulher na gestação. Os serviços de perinatologia demandam um grande esforço para atender essas situações evitáveis e indesejáveis.

Palavras-chave: recém-nascido; gravidez; transmissão vertical de doenças infecciosas; sífilis; HIV.

INTRODUCTION

Congenital infections are acquired by hematogenous transplacental passage, from contact with maternal blood and vaginal secretions (syphilis, hepatitis B, cytomegalovirus, toxoplasmosis, rubella, Zika, chikungunya and dengue), and/or from exposure to breast milk (cytomegalovirus, human immunodeficiency virus – HIV and herpes)[1]. These are related to a higher risk of morbidity and mortality in the neonatal period[2] and can cause serious complications in the newborn (NB)[3].

Among sexually transmitted infections (STIs) present in this group, syphilis and exposure to HIV are still a challenge in the 21st century. The World Health Organization (WHO) estimates that 1% of pregnant women are infected and that 350,000 cases present fetal complications resulting from diseases[4]. The situation of syphilis in Brazil is not different from that of other countries; the number of cases is worrying and the infection needs to be controlled. In 2018, compared to 2017, there was an increase of 25.7% in the detection rate of the disease in pregnant women and a 5.2% increase in the incidence of congenital syphilis. The Southeast region has a case rate of 24.4/1,000 live births, and Rio de Janeiro has the highest detection rate (41.4 cases/1,000 live births, with an increase of 16.3% in relation to the year of 2017). Regarding the incidence of congenital syphilis, the rate was 18.7 cases/1,000 live births, while the rate in Brazil is 9.0 cases/1,000 live births[5].

Syphilis in pregnant women leads to approximately 200,000 fetal and neonatal deaths every year and leaves more than 150,000 children at increased risk of dying from prematurity, low birth weight or congenital disease[6].

Syphilis transmission to the fetus is more frequent in the early stages of the disease. Therefore, when a pregnant woman has syphilis and does not treat it, around 70 to 100% of fetuses get infected.

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Vertical transmission of HIV occurs when the virus passes from mother to baby during pregnancy, labor, delivery itself (contact with cervico-vaginal secretion and maternal blood) or breastfeeding, with about 35% of this transmission occurring during pregnancy, 65% occurs in the peripartum period and there is an increased risk of transmission through breastfeeding, which is between 7% and 22% by exposure (breastfeeding). Vertical HIV transmission occurs in about 25% of pregnancies of infected women when prophylaxis is not performed[7]. More than 90% of cases of HIV infection in children worldwide are caused by vertical transmission, which is one of the three general modes of HIV transmission(8).

In a 10-year period, there was an increase of 21.7% in the HIV detection rate in pregnant women, except in the Southeast region, where a trend was maintained and was not very expressive in this period[9].

OBJECTIVE

To evaluate the prevalence of congenital syphilis and exposure to HIV among cases of congenital infections, as well as the profile of newborns.

METHODS

Cross-sectional, analytical study with data collected from medical records of newborns admitted to the Conventional Neonatal Intermediate Care Unit (UCINCo), Kangaroo (UCINCa) and Rooming-in Accommodation (AC), added to the database of the Service of the Federal Hospital of Bonsucesso, from January 2015 to December 2018.

The Federal Hospital of Bonsucesso is part of the Unified Health System (SUS) network, linked to the Health Care Secretariat of the Ministry of Health and characterized in the National Register of Health Establishments (CNES) as Bonsucesso General Hospital, with tertiary and quaternary levels, acting at medium and high complexity, including pregnant women and newborns. It is located in the Bonsucesso neighborhood, Program Area 3.1, North Zone of the City of Rio de Janeiro.

All NB who were discharged participated in the study, and cases diagnosed with congenital infection were selected. Cases considered as congenital syphilis and exposure to HIV were submitted to treatment during hospitalization. Readmissions (n=111 during the study period) were excluded, to avoid double counting.

All statistical analyses were performed in the IBM SPSS statistical package for Windows, Version 24.0 (IBM Corp., Armonk, NY, USA), and $p<0.05$ was used as a significant value in all tests.

RESULTS

During the study, 2,202 newborns were discharged from hospital and 474 had a congenital infection (21.8%) (**Table 1**).

Problems during pregnancy were present in 1,681 (76.9%), while congenital infection was present in 236 pregnant women (14.7%).

Prenatal care with more than six consultations was reported by 1,280 mothers (60.8%); 552 (26.2%) had between two and five consultations; 49 (2.3%) only one appointment; and 224 (10.6%) had no appointments. Analyzing the group with congenital infection, 210 pregnant women (51.0%) had more than six appointments, 115 (27.9%) had two to five appointments, 14 (3.4%) had only one appointment and 72 (17.5 %) had no appointments.

When verifying the association of absence of consultations in the whole group and presence of morbidities in newborns, the relation between prenatal care and absence of congenital infection was evident (**Table 2**).

Among congenital infection pictures, the most common clinical situations were congenital syphilis, with 398 cases (81.1%), and maternal HIV infection, with 40 cases (8.1%) (**Table 3**).

Table 1 – Number of hospitalizations due to congenital infection (syphilis and human immunodeficiency virus), Federal Hospital of Bonsucesso, Rio de Janeiro – Brazil, between January 2015 and December 2018.

	Frequency	Percentage	Valid percentage	Cumulative percentage
Syphilis	388	81.9	81.9	81.9
HIV	30	6.3	6.3	88.2
Syphilis and HIV	10	2.1	2.1	90.3
Other infections	46	9.7	9.7	100
Total	474	100	100	

HIV: Human immunodeficiency virus.

Table 2 – Relationship between prenatal care and absence of congenital infection, Federal Hospital of Bonsucesso, Rio de Janeiro – Brazil, between January 2015 and December 2018.

		Prenatal care		Total p-value (Fisher) OR 95%CI	
		No	Yes		
Congenital infection	No	150	1,476	1.626	p<0.001
	Yes	75	381	456	0.51; 0.83–0.69

Table 3 – Frequency of cases of syphilis and human immunodeficiency virus in cases of congenital infection during the study at the Federal Hospital of Bonsucesso, Rio de Janeiro – Brazil, between January 2015 and December 2018 (n=460).

		Answers		Percentage of cases
		N	Percentage	
Congenital infection	SYPHILIS	398	81.1	84.0
	HIV	40	8.1	8.4
	TOXO	23	4.7	4.9
	HEP B	10	2.0	2.1
	HEP C	6	1.2	1.3
	CMV	9	1.8	1.9
	RUBELLA	4	0.8	0.8
	HERPES	1	0.2	0.2
Total		491	100	103.6

HIV: Human immunodeficiency virus; TOXO: toxoplasmosis; HEP B: hepatitis B; HEP C: hepatitis C.

When analyzing the births that occurred in the hospital premises, the percentage of congenital syphilis over the years ranged from 7.5% in 2015 to 4.6% in 2017 (**Figure 1**).

In our study, the frequency of congenital infection was stable, with no significant difference between years (p=0.786) (**Figure 2**).

The mean age of pregnant women in the study was 26.47 (95%CI 26.15–26.78; SD=7.35) with a significant difference (p<0.001); the minimum age was 13 years old, and maximum was 47 years old. The mean age of pregnant women with congenital infection was 23.85.

Among hospitalized newborns, congenital infection was found in 117 premature infants (5.3%) and in 352 NB (16.3%) with more than 37 weeks.

When the association of prematurity and congenital infection was verified, a statistically significant association was found (p<0.001) (**Table 4**).

The percentage of low birth weight in this study was 36% (789 NB); of these, 105 (23.7%) had congenital infections. (**Table 5**).

When the association between congenital infection and low birth weight (<2,500 g) was verified, there was also a statistically significant association (p<0.001).

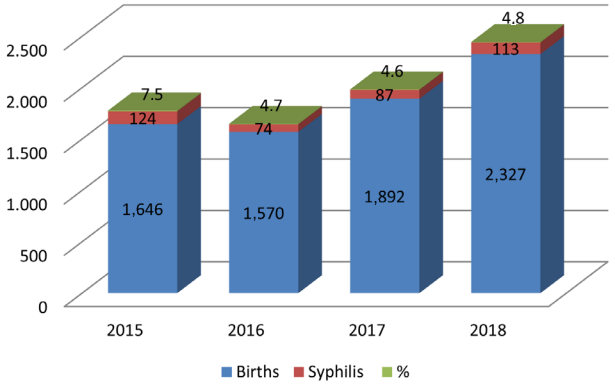

Figure 1 – Percentage of congenital syphilis per births/year at the Federal Hospital of Bonsucesso, Rio de Janeiro – Brazil, from 2015 to 2018.

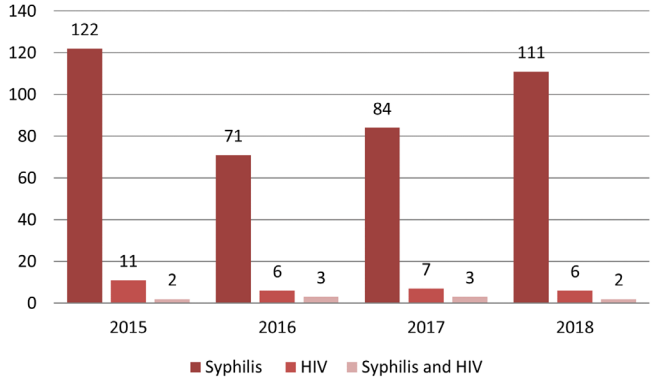

Figure 2 – Frequency of congenital infection/syphilis/human immunodeficiency virus in the years of study at the Federal Hospital of Bonsucesso, Rio de Janeiro – Brazil, between January 2015 and December 2018.

Table 4 – Association between prematurity and congenital infection during the study at the Federal Hospital of Bonsucesso, Rio de Janeiro – Brazil, between January 2015 and December 2018.

	Gestational age			p-value (Fisher) OR 95%CI
Congenital infection	≥37S	<37S	Total	
No	937	752	1,689	p<0.001 0.42–0.33–0.52
Yes	352	117	469	
Total	1,289	869	2,158	

Table 5 – Distribution of congenital infection according to stratified weight in patients admitted to the Federal Hospital of Bonsucesso, Rio de Janeiro – Brazil, between 2015 and 2018.

			Congenital infection		Total
			No	Yes	
Stratified weight	<1 kg	Counting	42	5	47
		% in CI	2.4	1.1	2,2
	1.01–1,500 kg	Counting	107	18	125
		% in CI	6.2	4.1	5,8
	1,501<2,500	Counting	524	82	606
		% in CI	30.4	18.5	28.0
	>2,500	Counting	1,048	338	1,386
		% in CI	60.9	76.3	64,0
Total		Counting	1,721	443	2,164
		% in CI	100	100.0	100.0

DISCUSSION

As for neonatal morbidity, the frequency of congenital infection was 21.8% (474 cases) and the most frequent situations were congenital syphilis, with 398 cases (84%) and maternal HIV infection, with 40 cases (8.4%).

The mean age of pregnant women was 26.4, while among those identified with congenital infection it was 23.85 years. A study carried out in São José do Rio Preto reports the profile of pregnant women as aged 20–29 years (55%)[10].

When verifying the association between absence of consultations and presence of morbidities, the relation between prenatal care and the absence of congenital infection was evident, although the group of pregnant women with congenital infection (210 cases, 51%) had had more than six appointments.

The number of prenatal consultations is not always directly related to the presence of problems in the newborn. Nunes et al., after reviewing the literature on assessments of several cities in the South, Southeast and Northeast regions of Brazil, were able to state an increase in the coverage of prenatal care over the years, "despite the quality"[11]. 68.2% of pregnant women in this study had had more than six consultations and, even so, the newborn required hospitalization due to some type of complication after birth. A study carried out in the city of Rio de Janeiro, with a view to the Index of the Expanded Program for the Humanization of Prenatal Care, confirmed that only 33.3% of prenatal care appointments were considered adequate[12].

According to the guidelines from 1988 by the Centers for Disease Control and Prevention, adopted by the Ministry of Health of Brazil in 1990 and ratified in 2004, the diagnostic criteria for congenital syphilis valued, in one of the items of pregnant women adequately treated for syphilis, the situation of their partners (whether or not they had received adequate treatment, and if information was not available)[13]. Despite this, some assessments and treatment protocols for congenital syphilis do not consider the partner's treatment as an adequate treatment criterion for syphilis in pregnant women[14]. A study in São José do Rio Preto identified inappropriate treatment in 94% of pregnant women, and 82% of their partners had not been treated, which shows that inadequate treatment of pregnant women along with their partners is the key point for the occurrence of congenital syphilis[10].

The service understands that the protocol, by not considering partners in the criteria for adequate treatment of pregnant women, may interfere with reinfection at the end of the third trimester. The guarantee of monitoring of the newborn is also worrying, because their absenteeism in the pediatric infectious disease outpatient clinic was reported high.

Rêgo et al., in a study conducted with women residing in Recife, between 2010–2014, defined that 79.1% of early neonatal deaths were preventable, and, of these, 57.9% were associated with situations that could have been reversed with better care during pregnancy. The five main situations, in order of frequency, were maternal conditions affecting the fetus/NB, complications during pregnancy affecting the fetus/NB, intrauterine hypoxia/neonatal asphyxia, membrane/placental complications affecting the fetus/NB, and congenital syphilis[15].

Congenital syphilis (ICD: A50) and diseases caused by the human immunodeficiency virus (B20–B24) are associated with deaths that are reducible by adequate care for women during pregnancy[16].

Rêgo et al., studying preventable perinatal deaths in SUS hospitals, reported that 81.2% of perinatal deaths were considered preventable[15].

Bampi et al.[17], while describing syphilis cases in Mato Grosso do Sul, from the National Medical Care System (SINAN), determined that the incidence of syphilis can be reduced by improving prevention, through counseling on the risk of infection, ease of access to barrier methods and increased use of diagnostic tests. Andrade et al. described a case of congenital syphilis with late diagnosis, which probably occurred due to a failure in prevention strategy at the primary, secondary and tertiary levels of health care[18].

Souza et al., while analyzing the transmission of syphilis, defined a new demographic and spatio-temporal epidemiological model in 32 cities in São Paulo (SP), to understand the dynamics of contamination by treponema[19]. Despite the impossibility of comparisons between results, an epidemiological scenario with high prevalence of this disease is portrayed, even though it remains on the list of preventable diseases and is sensitive to penicillin.

Studies have found that untreated syphilis during pregnancy results in a considerable proportion of early fetal and neonatal death[20], prematurity or low birth weight among infants of women with syphilis, when compared to those of women without syphilis[21].

In our study, congenital infection was found in 117 (5.3%) premature NB and 105 (23.7%) low birth weight NB. A study carried out in Rio Branco with 90 newborns exposed to syphilis reported prematurity in 10% of the sample; moreover, 12.2% of NBs were small for gestational age[22].

Other reports across Brazil portrait our current situation. Padovani et al. claim, after analyzing SINAN, the Information System on Live Births (SINASC) and the Mortality Information System (SIM), that the results still show a long way to go to reach the WHO target for eradication of congenital syphilis[23].

All newborns diagnosed with congenital infection were subjected to treatment for syphilis and to a vertical HIV exposure protocol. Follow-up was ensured at the pediatric infectiology clinic and neuropsychomotor development follow-up clinic.

Strengths

The strength of this study was the significant number of newborns with congenital syphilis infection, which determines the importance of prenatal screening and adequate treatment of pregnant women so as to prevent avoidable hospitalizations of newborns.

Limitation

The main limitation of our study was the analysis being performed with existing data, from a database already prepared and that could have information missing, potentially leaving some data incomplete.

CONCLUSION

Congenital infection was one of the main causes of neonatal morbidity, with syphilis and HIV presenting the highest prevalence. These clinical pictures are associated with deaths that are reducible by adequate care for women during pregnancy, but perinatology services continue to demand a large amount of time, tests and specific flows to manage these avoidable and undesirable situations. In the 21st century, the presence of morbidity in newborns due to situations that could be totally or partially prevented by actions of accessible and effective health services is a challenge for Public Health.

Participation of each author

Márcia Saldanha dos Santos Moura: bibliographical survey, data collection, tabulation in the software, preparation of tables and graphs, writing of the study.

Prof. Dr. Israel Figueiredo Jr.: Tabulation in the software, preparation of tables and graphs, orientation and review of the work.

Fátima Maria Campinho Pinheiro: data collection.

Diana Almeida de Lima: data collection.

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Conflict of interests

The authors declare no conflicts of interest.

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