

Predisposing Factors for Incidence of Congenital Syphilis

REVIEW

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Abstract

The study aims to synthesize the knowledge produced in articles about the predisposing factors for the incidence of Congenital Syphilis. An integrative review was conducted in May and June 2014. Three databases were consulted and all publications available at the pre-established time frame were collected. The descriptors congenital syphilis, incidence and causality in Portuguese, English and Spanish were used, resulting in 1723 articles, of which 23 were selected. The results show deficiency in prenatal care; poor diagnosis; inadequate care of the disease; unequal socioeconomic conditions; difficult access to health services; and poor guidelines. The increasing number of new cases of congenital syphilis is due to several factors that can be prevented through quality prenatal care. Therefore, care actions during pregnancy and puerperium need to be redirected so that they are based on early diagnosis, immediate treatment of the couple and health education.

Keywords

Congenital Syphilis; Incidence. Etiology; Mother-Child Nursing.

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Introduction

Congenital syphilis (CS) is considered a serious public health problem. This is at odds with the fact that this is a preventable disease, easily diagnosed in laboratory and treated, with actions available in primary care for couples and large probability of cure. Despite of it, congenital syphilis has had great impact in society because its severe effects on pregnant women and especially on fetuses [1].

It is known that the disease is caused by contamination of the fetus with *treponema pallidum* bacteria. This agent crosses the placental barrier and can cause multiple organ impairment and even death of the newborn. The clinical picture varies with time of fetal exposure, treponemal load of the mother, period of treatment and presence or absence of HIV coinfection. It is noteworthy that untreated women have a transmission rate above 70%. The drugs used to treat the newborn and the couple are the crystalline penicillin G and benzathine, respectively. Monitoring is indispensable and serum VDRL testing is necessary after completion of treatment [2].

According to the World Health Organization (WHO) 2014, syphilis is a worldwide problem, affecting 12 million people every year [3]. According to data of the Unified Health System Computer Department (DATASUS), 7,430 cases of CS were reported by the National Disease Notification System (SINAN) in 2013. These were distributed in the following regions of the country: 2,856 in the Southeast, 2,821 in the Northeast, 804 in the North, 716 in the South and 233 in the Midwest. It is noteworthy that in the time series between January 2005 to December 2013, 25,748 episodes of illness occurred in the country [4].

In order to combat this problem, several initiatives and ministerial documents have been launched in Brazil. Some examples are: the Ordinance 542 with the purpose of turning syphilis into a mandatory reportable disease; the Program for Humanization of Prenatal Care and Birth (PHPB) which focused on clinical and laboratory procedures; the operational plan that set the goal of properly diagnosing and treating 100% of pregnant women and newborns; the Birth Project, establishing the mandatory screening for syphilis at birth in public maternity hospitals; and recently, the rapid test in primary care, in addition to the Stork Network which aims to ratify all these rights. Nevertheless, the number of new cases in the country, with serious consequences particularly to newborns, including stillbirth, is still increasing [5].

However, despite considerable advances and despite the knowledge of the long incubation period, transmission ways, etiologic agent and treatment, and the high rates of cure [6], syphilis persists as a challenge worldwide. Furthermore, one of the authors of the present paper has experience as a nurse within public hospitals. During this experience, it was common to observe the constant occurrence of new cases of congenital syphilis, despite various initiatives and ministerial protocols for the prevention of this disease. Thus, a concern and interest in knowing the factors that predispose to high incidence of the disease arose among authors.

In light of the foregoing, it is important to deepen the investigation about the causes of the persistent prevalence of congenital syphilis. Thus, the following guiding question was set for this study: What scientific knowledge on predisposing factors for incidence of congenital syphilis is available in the literature? In order to address this question, the objective of this research was to synthesize the knowledge available in scientific articles about the predisposing factors for the incidence of congenital syphilis.

Method

This is an integrative review carried out in five stages, namely: identification of the research question, literature search, review of documents, data analysis and presentation of results [7].

For this, literature was searched in the months of May and June 2014 by two researchers on different computers on the same day and time. The search was carried out in the databases: SCOPUS, CINAHL (*Cumulative Index to Nursing and Allied Health Literature*) and LILACS (*Latin American and Caribbean Health Sciences*). A total of 1723 studies were found using the following MESH (*Medical Subject Headings*) descriptors: *syphilis congenital* (congenital syphilis), *causality* (causalidade), and *incidence* (incidência). These descriptors were crossed, resulting in

the following data: *syphilis congenital* AND *causality* (SCOPUS = 16, CINAHL = 03, LILACS = 29); *syphilis congenital* AND *incidence* (SCOPUS = 1440, CINAHL = 126, LILACS = 93); *syphilis congenital* AND *causality* AND *incidence* (SCOPUS = 09, CINAHL = 02, LILACS = 05).

Regarding the time frame, all publications available until June 2014, without initial limit, were included with the intention to provide a comprehensive assessment on the object of study. Abstracts were initially read for data collection. The following inclusion criteria were applied: free articles available online in full-length in the selected databases, published in Portuguese, English and Spanish and that addressed the predisposing factors for the incidence of congenital syphilis. Letters to the editor; editorials; other types of review and studies that did not address the theme were excluded. After application of the eligibility criteria, and upon complete

reading of each study, as well as selection of articles that had clarity of methodological design, a sample of 23 articles was selected, of which 13 were found in SCOPUS, 3 in CINAHL and 7 in LILACS.

The description of articles was organized according to the identification of the article, place where it was held, objective, method and year of study. After this step, the predisposing factors for the incidence of congenital syphilis were listed by the number of times that each factor appeared and grouped by similarity. Six categories emerged. The results were descriptively presented and analyzed on the basis of ministerial protocols.

Results

Twenty-three articles published between 2001 and 2014 that met the inclusion criteria were analyzed.

Table 1 presents the characterization of these stu-

Table 1. Characterization of articles carried out in developing countries, objective and method. Rio Grande do Norte, RN, 2014.

Id*	Method	Country	Year	Objective
A ⁸	Ecological study	Brazil	2014	Determine the incidence rates of congenital syphilis in southern Brazil from 2001-2009
B ⁹	Descriptive study	Brazil	2013	To collect sociodemographic and obstetric information related to the diagnosis and treatment of pregnant/puerperal women and partners of 67 pregnant/ puerperal women reported in the National Disease Notification System, public hospitals users in the Federal District, Brazil, between 2009 and 2010.
C ¹⁰	Descriptive sectional study	Brazil	2011	To describe the occurrence of congenital syphilis in the city of Natal-RN considering the epidemiological profile of mothers and cases reported by the municipality.
D ¹¹	Cross-sectional study	Bolivia	2007	To calculate the frequency of maternal and congenital syphilis, the transmission of the etiologic agent from mother to newborn, and the variables associated with the disease in six public hospitals in Bolivia
E ¹²	Descriptive study	Brazil	2007	Present data on the monitoring of syphilis during pregnancy carried out by the Municipal Health Secretariat of Rio de Janeiro from 1999 to 2004
F ¹³	Ecological study	Brazil	2012	To estimate the incidence of congenital syphilis and identify its relation to the Family Health Strategy coverage.
G ¹⁴	Surveillance study	Brazil	2013	To describe the evolution of the incidence of congenital syphilis in Belo Horizonte between 2001 and 2008 and determine the risk factors associated with the diagnosis of the disease.
H ¹⁵	Cross-sectional study	Bolivia and Brazil	2012	To evaluate the characteristics of the assistance provided to Bolivian mothers and its outcomes in a hospital in São Paulo.
I ¹⁶	Ecological study	United States of America	2010	To assess recent trends in cesarean rates based on national surveillance data from 2003 to 2008.

Id*	Method	Country	Year	Objective
J ¹⁷	Cross-sectional study	China	2011	To identify data on syphilis testing in all clinical settings where women give birth.
K ¹⁸	Cross-sectional study	Colombia	2012	To determine the prevalence of gestational syphilis and incidence of congenital syphilis in the city of Cali, Colombia 2010.
L ¹⁹	Ecological study	Colombia	2013	To analyze the retrospective electronic health record of all children hospitalized with CS during the first 7 months of 2011
M ²⁰	Cross-sectional study	Spain	2013	To study the epidemiology, diagnosis, treatment strategies and perinatal outcomes of gestational syphilis.
N ²¹	Cross-sectional study	Brazil	2013	To analyze the prenatal care related to prevention of vertical transmission of syphilis.
O ²²	Ecological study	Netherlands/ United States/ Switzerland/ United Kingdom	2013	To identify syphilis incidence in pregnancy and adverse outcomes in 2008, as well as prenatal care coverage for women with syphilis.
P ²³	Cross-sectional study	Spain	2012	To analyze the characteristics of 67 cases of congenital syphilis confirmed by the surveillance system in Spain (2000-2010)
Q ²⁴	Cross-sectional study	United States of America	2009	To analyze cases of syphilis regarding demographic and behavioral characteristics in the period from June 01, 2006, to May 31, 2007.
R ²⁵	Cross-sectional study	India	2008	To identify the diagnostic data for syphilis among women who gave birth between October 1, 1998, and September 30, 2002.
S ²⁶	Cross-sectional study	United States of America	2006	To evaluate the screening method through which pregnant women were selected for syphilis according to standard recommendations twice during the prenatal and childbirth.
T ²⁷	Case-control study	United States of America	2004	To investigate maternal risk factors for congenital syphilis.
U ²⁸	Cross-sectional study	Europe	2003	To describe the frequency, risk factors and labor consequences of children with congenital syphilis among pregnant women with active syphilis.
V ²⁹	Cross-sectional study	United States of America	2002	To characterize pregnancies that had complications due to maternal syphilis, treated before delivery, and in which the newborn was diagnosed with congenital syphilis.
X ³⁰	Cross-sectional study	Bolivia	2001	To determine the prevalence of maternal syphilis at delivery and the associated risk factors; to determine the rate of congenital syphilis in infants born to women with syphilis at delivery.

Source: Researchdata.*: Article identification

dies. Only eight studies were conducted in Brazil, and there was a predominance of studies in the United States, Bolivia, Colombia, Spain, among other countries. The most frequent methodological designs were cross-sectional and ecological studies, i.e. population samples.

The predisposing factors for the incidence of CS were divided into categories and subcategories. Most of the articles presented these factors in more than one category, as shown in the table below. (Table 2)

Table 2. Predisposing factors for incidence of congenital syphilis according to categories, Rio Grande do Norte, RN, 2014.

Categories	Subcategories
Deficiency in prenatal care [9-10, 12, 15-16, 18-19, 21-23, 25, 27-28, 30]	Low quality
	Inadequate monitoring
	Insufficient number of consultations
	Late initiation
	Failure to perform prenatal
	Uninvestigated cases
	Low resolutivity

Categories	Subcategories
Inadequate care of the disease [8-10, 12-14, 16, 18-24, 27-29]	Inappropriate treatment of pregnant women
	Difficulty to treat partners
	Lack of follow-up of couples under treatment
	Lack of treatment of the couple
	Incorrect dosage
	Late treatment
	Partners' refusal to adhere to treatment
Poor diagnosis [10-14, 16, 21, 23-24, 26-27]	Delayed test results
	Delayed diagnosis
	Lack of timely diagnosis of couples
	Insufficient number of diagnostic tests
Unequal socioeconomic conditions [9-11, 13-14]	Inadequate general living conditions of the population
	Low level of education
	Young age
	Social inequalities
Difficult access to health services [8, 12, 17, 19, 22, 25, 27, 30]	Flaws in the health system
	Low efficiency of control mechanisms
	Difficult access to diagnostic tests
	Difficult access to treatment
	Non-performance of diagnostic tests
Poor guidelines [24]	Flaws in health education
Source: Source: research data. *: Article identification	

The factors identified were deficiency in prenatal care; poor diagnosis; inadequate care of the disease; unequal socioeconomic conditions; difficult access to health services; poor guidelines. It is noticed that the inadequate care of the disease was the category that brought together the largest number of studies (17) and had seven sub-categories, among which stands out the inappropriate treatment of pregnant women and difficulty to treat partners.

Discussion

The results show a predominance of studies outside Brazil; only eight out of the twenty-three articles were carried out in Brazil. Cross-sectional and eco-

logical methods predominated; only one study addressed the lack of action on health education. The categories that stood out in this study on predictors of CS were the inadequate care of the disease followed by deficiency in prenatal care.

According to the Ministry of Health (MOH), it is essential to treat the couple in due time, during prenatal care, so that the pregnant woman may be cured by the time of delivery, thus preventing vertical transmission. However, the control of syphilis during pregnancy is troublesome due to the number of men who do not adhere to treatment, or do this improperly. [2] In addition, many do not undergo the therapy recommended by Program for Humanization of Prenatal Care and Birth (PHPB). This was observed in some studies that addressed the inadequate treatment due to incorrect dosage as one of the predisposing factors for the disease. Authors report that this problem can raise the risk of neonatal infection in up to 80%, as highlights the World Health Organization (WHO) [3].

Thus, in spite of the fact that syphilis is known for centuries and has a well defined etiological agent, effective and low cost treatment with high rates of cure, there is still a lack of uniformity in the diagnosis, monitoring and management. Therefore, the interdisciplinary approach of families through the Family Health Strategy (FHS) as early as possible, precisely during prenatal care, is recommended in order to ensure the follow-up of cases, adherence to treatment, control and prevention of this disease. However, the high incidence shows the flaw in prenatal care and problems in the serological screening and therapeutic plan of action [6].

Given the above, it is obvious that despite the expansion in the coverage aiming at monitoring pregnant women that has taken place in Brazil in recent years, high rates of vertical transmission still persist. This demonstrates the little quality and safety of this care [5]. Noteworthy is that prenatal care was the second category with the largest number of articles, focusing on the low quality of consultations and the inadequate monitoring of pregnant women.

It is known that effective measures to prevent and control congenital syphilis are directly related to the realization of quality prenatal care. This includes, among other factors, the early identification of the disease in pregnant women, the realization of at least six consultations; the first mandatory performance of serum VDRL testing in primary care and the second at 28 weeks of pregnancy, and at the time of admission for delivery [31].

Thus, the aim of this service must be to perform timely interventions with emphasis on compliance with the protocol recommended for the prevention and control of vertical transmission of *treponema pallidum*. This way, early diagnosis and proper treatment will be possible, as these are the major health determinants of mothers and babies and have the potential to reduce the leading causes of neonatal mortality resulting from this disease [32].

However, poor diagnosis was identified as the third category and highlighted the late discovery of the disease as a key factor responsible for this gap. Diagnosis can be obtained through clinical or epidemiological means and laboratory testing. Laboratory analysis can be performed from the fourth week after contact with the bacteria. For this, treponemal (TPHA, FTA-Abs, ELISA) and non-treponemal (VDRL, RPR)serological tests are mainly used [5]. A positive result in any degree in pregnant women is considered a positive diagnosis, provided they have not been properly treated in previous moments or if therapy documentation is not available [2].

Thus, in order to realize early diagnosis and appropriate treatment of the mother and the partner, it is necessary to expand the access to health services, especially with regard to prenatal care [1]. In this sense, the fourth category addressed the difficulty of access to these services, especially with regard to laboratory tests and appropriate treatment, factors mentioned in eight articles. These obstacles contribute decisively to increase the incidence of the disease.

Thus the MOH started in 2011 the implementation of the Stork Network in Brazil with the aim of expanding and improving the quality of prenatal care offered at the primary level of health care. This initiative relied on the offer and assurance of access to rapid syphilis and HIV tests so that vertical transmission of these diseases could be eliminated, with a view to reducing maternal and child mortality in all social classes [31].

In this context, the fifth category comprised the unequal socioeconomic conditions. Higher incidence of this disease showed to be associated with low levels of education and poor socioeconomic conditions. Thus, good education level of mothers is considered an important factor to reduce the infant mortality rate caused by this disease [33]. Thus, issues related to socioeconomic conditions indicate high vulnerability of women in relation to reproduction, which makes the challenge of disease control in this population even more complex [31]. The largest number of new cases of the disease happen in the age group of 20-34 years. This may be related to the most active reproductive phase, which implies an increase of young pregnant women [34].

Thus, Family Health Strategy professionals must be attentive to the users of their assigned area with respect to factors such as poverty and education level. They should provide information about the disease and advice the couple, seeking to fight the transmission of these diseases by dissemination of knowledge and assessment of risk conditions [35].

However, despite the importance of health education for prevention of congenital syphilis, poor guidelines are listed in the sixth category. This was addressed by one article, possibly indicating a very significant weak point for the control of this disease. This is because guidelines regarding the vertical transmission of CS must be provided since the moment of prenatal care, and should include explanations about the risks and consequences of the disease to the mother and to the fetus in order to reduce the incidence of this disease [36].

However, health professionals often do not provide enough information on the subject. Thus, in order to improve this point, it is necessary to invest in training professionals, especially those that make up the FHS teams, because this is the gateway to the health service, and it is through the FHS that pregnant women receive the first guidance [37]. The information to be passed to women include, among others, syphilis and HIV tests and protocols in order to prevent vertical transmission [38].

Thus, teamwork, provision of care access to information through health education activities with families and community can contribute to therapeutic communication [39] so that prenatal may contribute to the significant decrease of risks during pregnancy [40].

Conclusions

The results of the present research show that the growing number of new cases of CS in Brazil and in the world has multifactorial causes that can be prevented by providing quality prenatal care. Through this care, it is possible to resolve most of the aspects cited in this study that contribute to the high incidence of the disease, such as inappropriate treatment of pregnant women and partners.

Another important action to prevent the disease is health education. Despite the importance of this aspect, this issue was addressed by one article only, indicating one sign of flawed control of CS. In general, the studies analyzed did not present this approach as essential for preventing vertical transmission.

Thus, in view of the above, it appears that there is still a long journey to eliminate this disease. In order to eliminate the problem in fact, the primary level of health care needs to be recognized as a privileged environment for combating this disease. Thus, care actions during pregnancy and puerperium need to be redirected so that they are based on early diagnosis, immediate treatment of the couple and health education.

For this, greater investment in this area and especially the expansion of the view of health professionals on this issue are needed in order to establish a humanized relationship with the population, fostered by active and sensitive listening. This way, planning of health actions to eliminate the gaps will be possible. In this approach, the role of nurses is essential, for this profession has the potential of opening paths to reach increasingly bold and solid goals.

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