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REVIEW ARTICLE

Prenatal approach to syphilis in primary health care: a literature review

Abordagem pré-natal da sífilis na atenção primária de saúde: uma revisão bibliográfica

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ABSTRACT

Syphilis is caused by the infectious agent *Treponema Pallidum*, which can be vertically transmitted. This can generate serious complications in pregnancy and for the development of the fetus. When transmitted to the fetus, it leads to congenital syphilis. There is a high rate of transmission in the first and third trimesters of pregnancy. When transmitted, the fetal mortality rate is about 40%. Thus, it is a serious public health concern, which can be prevented with effective prenatal care. This is a review of the Medline, SciELO and LILACS databases of articles from the last 10 years. These aim to verify the Brazilian medical aid to gestational and congenital syphilis in primary care. Data shows that 1.3 to 2.0 million women are infected with syphilis per year worldwide, and that about 1/3 of these are not tested for syphilis during pregnancy. In Brazil, the incidence rate of congenital syphilis is 9.0/1000 live births, with a mortality rate of 8.2/1,000 live births in 2018, contrary to the expectations of the Pan American Health Organization to reduce to <0.5/100 live births by 2015. Primary care, although it has increased its coverage up to 87.17% of the population, it has still failed prenatal care due to unpreparedness of healthcare professionals in screening, adequate treatment for pregnant women and their partners, and a lack of prevention programs. Thus, primary health actions to combat gestational and congenital syphilis are insufficient. Therefore, it is necessary to improve the quality of prenatal care to reduce the incidence of the disease in Brazil, where syphilis is a serious and virulent epidemic.

Keywords: Syphilis; Prenatal care; Primary health care.

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RESUMO

A sífilis é provocada pelo agente infeccioso *Treponema Pallidum*, que pode ser transmitido por via vertical e gerar graves intercorrências na gestação e no concepto. Há elevada taxa de transmissão no primeiro e no terceiro trimestres de gestação e, quando transmitida, a taxa de mortalidade do feto é cerca de 40%. Dessa maneira, é um grave problema de saúde pública, que pode ser prevenido durante o pré-natal efetivo. Trata-se de revisão nas bases Medline, SciELO e LILACS, de artigos dos últimos 10 anos, que objetiva verificar a assistência brasileira à sífilis gestacional e congênita na atenção primária. Dados literários exibem que 1,3 a 2,0 milhões de mulheres são infectadas por ano pela sífilis, mundialmente, e que cerca de 1/3 dessas não são testadas para sífilis na gestação. No Brasil, a taxa de incidência de sífilis congênita foi de 8.2/1000 nascidos vivos em 2019, contrariando a expectativa da Organização Pan-Americana de Saúde de reduzir para <0.5/1000 nascidos vivos até 2015. A atenção primária, embora apresente aumento de sua cobertura para 87,17% da população, tem atendimentos falhos no pré-natal: despreparo dos profissionais de saúde na triagem e no tratamento adequado da gestante e do parceiro, e carência de programas de prevenção. Assim, as ações primárias de saúde em combate à sífilis gestacional e congênita são insuficientes. Faz-se necessário melhoria na qualidade dos pré-natais, para reduzir a incidência da enfermidade no Brasil, onde a sífilis é uma grave epidemia e calamidade pública.

Palavras-chave: Sífilis; Assistência pré-natal; Atenção primária à saúde.

Introduction

Syphilis is a disease caused by the bacterium *Treponema pallidum*, and its most common symptom is the appearance of painless ulcers in the genital region. The disease has various clinical phases, being: primary, with typical manifestation of ulceration or erosion in the genital region, secondary, with the presence of dermatological findings (such as erythematous spots, roseola, erythematous-squamous papules, hypertrophic papules, flat condylomas, alopecia and mucous plaques), recent and late latent, in which the stage is asymptomatic, and tertiary, with lesions of target organs[1].

During pregnancy, it can be transmitted hematogenouslyto the fetus, through placental transfer, after 14 weeks, and it can also be contaminated by contact with active lesions in the vaginal canal during delivery[1,2].When left untreated, the rate of transmission of the bacteria to the fetus soars between 70% and 100% in the first and second trimesters of pregnancy, respectively. In addition, when transmitted vertically to the fetus, it has an approximate mortality rate of 40%[3], it can cause adverse effects to the conceptus such as abortion, premature birth, death of the newborn, restricted intrauterine growth and clinical manifestations of the infection[3].When children survive, about 20% are symptomatic and present early, before 2 years of age, or late, after 2 years of age. Also, it is known that ⅔ of live births are asymptomatic at birth[2].

Among the clinical manifestations in the newborn (NB), the following are apparent: hepatomegaly with or without splenomegaly, skin lesions (palmoplantar pemphigus, flat condyloma), periostitis or osteitis or osteochondritis, pseudoparalysis of the limbs, respiratory distress with or without pneumonia, jaundice, anemia, generalized lymphadenopathy, among others. On the other hand, in late congenital syphilis, the symptoms in the NB include: dental alterations, with deformed upper middle incisor teeth (Hutchinson's teeth), interstitial keratitis as an ocular manifestation and neurological deafness[2,4].

Prenatal care, offered free of charge to the entire Brazilian population through the Unified Health System (SUS), aims to guarantee the development of pregnancies, allowing the delivery of a healthy newborn, without impact on the mother's health, and which includes a psychosocial approach, preventive and educational activities[5].In addition, it has the purpose of early identification of vertically

transmitted diseases, in order to avoid compromising the health of pregnant women and newborns. One example of these diseases is congenital syphilis. Thus, it is clear that, as a means of screening and diagnosis, there is the rapid, treponemal test for syphilis, and the non-treponemal Venereal Disease Research Laboratory Test (VDRL), which must be performed in the first and third trimesters as well as at the time of childbirth[2].The rapid test should be performed on all pregnant women, and if a reagent, venous collection for laboratory analysis should be performed. In addition, follow-ups with non-treponemal tests, such as VDRL or RPR, should be performed in the prenatal period to assess the effectiveness of the treatment, if syphilis is detected[6].

Although the coverage of prenatal care in the country is high in its entirety, reaching 97.4% of the Brazilian territory[7],the high incidence of the local disease (9.0/1,000 live births)[8]indicates a likely impairment of attention, since syphilis is a disease with well-established treatment and diagnosis. Vertical transmission is also absolutely preventable through the treatment of the pregnant woman. In addition, it presents low costs and minimal operative difficulties[9].In this sense, this review aims to characterize,through analysis of the literature, prenatal care with a focus on gestational and congenital syphilis (CS) in Brazilian primary health care.

Epidemiology

It is known that about 1.3 to 2.0 million pregnant women are infected worldwide with syphilis per year[10]. According to the World Health Organization (WHO), in 2008 alone, 1.4 million cases of infected pregnant women were reported with syphilis. Of these cases, 80% were attended at antenatal consultations and 20% did not attend any public health services, so they did not obtain prenatal care[11].However, of the women who did receive assistance in prenatal services, it is reported that up to ⅓ of them are not tested for syphilis[12].

The Pan American Health Organization (PAHO) created the goal, in 2010, of reaching <0.5 live births with CS per 1000 inhabitants by 2015; however, it is known that such a goalhas not been reached[13]. On the contrary, there has been an increase in the rate of syphilis infection, which became an epidemic and a serious public health issue.

In Brazilian epidemiological reports from 2019, the rate of CS was 8.2/1000 live births[14].In 2020, the Ministry of Health (MS) notified a rate of 9.0/1000 live births, demonstrating a small reduction[8]. However, it is noteworthy that this reduction may be related to data transfer problems between the SUS management spheres, which may cause a difference in the total number of cases between the municipal, state and federal syphilis databases. The decline in the number of cases may also result from the delay in notifications and the Sinan databases, due to the local mobilization of health professionals caused by the COVID-19 pandemic[8].

Thus, rates of syphilis in regard to pregnancy and congenital syphilis are still significantly high in Brazil. Maternal and child mortality is directly related to the ineffectiveness of prenatal care[15].Thus, knowledge of epidemiological data is essential, so that the subject receives special focus on prenatal consultations in primary care.

Methods

This is a bibliographical review, carried out by the Medline databases, within PubMed and Virtual Health Library, in addition to LILACS and SciELO. The search was performed using the keywords “syphilis”, “prenatal care” and “primary health attention”, of studies of the last 10 years. A total of 124 articles were found, of which 11 were selected for the final sample (Graphic 1). Among the inclusion criteria were: adequacy to the theme, national analysis and descriptive or observational studies. Those with narrative review were excluded. The characteristics of the studies are described in Table 1.

In addition, epidemiological bulletins and health manuals from the World Health Organization (WHO) and Ministry of Health (MS) on prenatal care and syphilis, from 2006 through 2019 were used.

Results

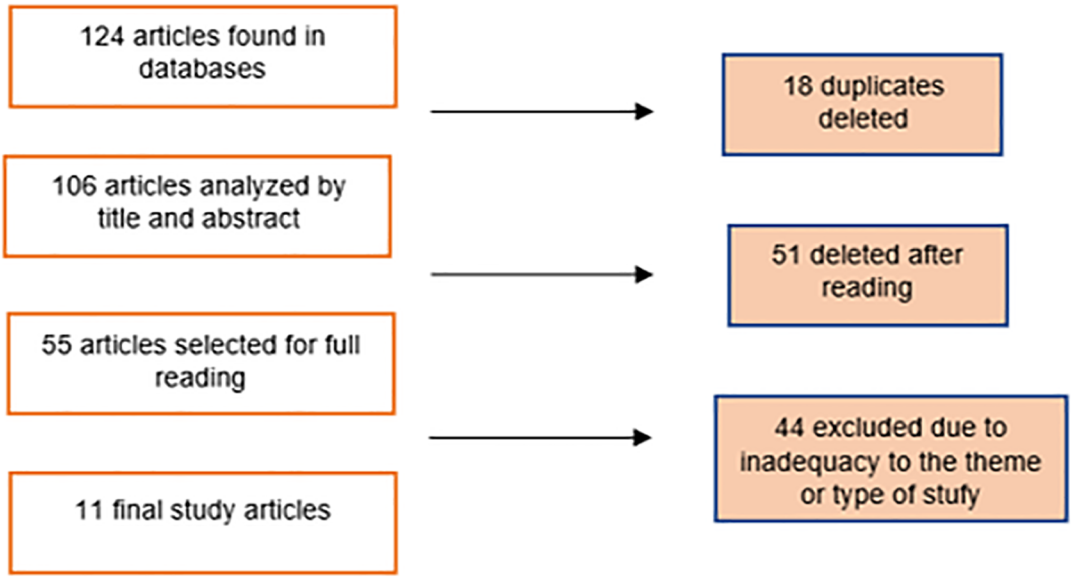
Prenatal approach to syphilis in primary care

The diagnosis and treatment of gestational syphilis are carried out in primary care, which has had an increase in the number of teams in recent years. According to data from the MS, prenatal care in primary care had an increase of 350% between 2000 and 2010, data available on the website of the Department of Informatics of the SUS (DATASUS; http://datasus.saude.gov.br/). In addition, it reached population coverage of 87.17% in 2014[6].

The creation and implementation of “*RedeCegonha*” (Stork Network), by the MS in 2011, promoted care in the puerperal and pregnancy period by health professionals, by strengthening the offer of rapid tests for screening syphilis and HIV (Human Immunodeficiency Virus) in Basic Health Units (UBS) and maternity hospitals, showing up as an important approach to mitigate the incidence of the disease[16].

Prenatal care is an important period for diagnosing such diseases, which promotes prevention of vertical transmission, as well as access of pregnant women and their partners to the care offered[16]. In relation to syphilis in pregnancy, it is the main period for the diagnosis of congenital syphilis to be made[17].

The level of quality, according to official health agencies, depends on: early intervention, universal coverage, frequency of consultations and quantity of prenatal consultations, with a minimum of 6 consultations[6], early identification of all pregnant women in the community, prompt start of prenatal care in the first trimester of pregnancy, registration of the pregnant woman in SISPreNatal, supply and completion of the prenatal card and clarification on the calendar of vaccines and exams recommended[7].



Graphic 1. Study selection methodology. Source: Elaborated by author; 2023.

Table 1. Characteristics of selected studies.

Author, date	Location	Year of the study	Type of study	Study sample
Lazarini *et al.* (2017)[11]	Londrina-PR	2013-2015	Experimental	102 professionals
Freitas *et al.* (2019)[15]	João Pessoa-PB	2013-2014	Ecological study	13.020 pregnant women
Figueiredo *et al.* (2020)[21]	João Pessoa-PB	2014	Ecological study	1.117 cities
Soares *et al.* (2017)[19]	Guarapuava-PR	2015-2016	Retrospective transversal	2.868 pregnant women
Benzaken *et al.* (2020)[23]	Rio de Janeiro/RJ	2016	Transversal	659.095 births
Costa *et al.* (2018)[20]	Francisco Beltrão-PR	2017	Qualitative descriptive transversal	45 health professionals
Nunes *et al.* (2017)[7]	Natal-RN	2016-2017	Transversal	64.348 residences
Oliveira et al. (2019)[17]	Natal - RN	2016	Transversal	129 pregnant women
Cavalcante (2019)[28]	São Paulo	2019	Transversal	28 cities
Domingues et al. (2014)[18]	Fortaleza - CE	2013-2016	Cohort	460 children
Lazarini et al. (2017)[11]	Rio de Janeiro - RJ	2011-2012	Cohort	23.894 women

Source: Elaborated by author; 2023.

However, despite the advances reported, it is known that the quality of care is not satisfactory, with high cases of late onset of prenatal care, which leads to late diagnosis of gestational syphilis. Oliveira et al. (2020)[18] found that 69.5% evaluated in the cross-sectional study in Natal, RN were diagnosed with syphilis only in third trimester, 39.5% were diagnosed with syphilis at the time of birth of the fetus and 3.9% only after birth, a fact that indicates failure in screening for the disease[17].

A national hospital-based analysis with 23,894 women interviewed in the postpartum period shows that 98.7% had at least one prenatal visit, but that 40% of pregnant women started prenatal care only after the 12th week. Evaluation of prenatal cards found that 89.1% had the result of the first serological test for syphilis, however only 41.1% had records of the second serological test, which demonstrates lack of adequate follow-up. This same study assesses that a higher prevalence of syphilis was reported in pregnant women without prenatal care[18].

In a cross-sectional study carried out in Guarapuava-PR by Soares et al. (2017)[19],from 90% of the pregnant women who went through prenatal care in the 1st trimester; 77.5% underwent the VDRL exam in this period; and only 45% underwent two or more exams following the consultations. In addition, in a cross-sectional study with 43 professionals who perform prenatal care in primary care on the knowledge

of their work, some reported that the VDRL exam was requested in the 1st, 2nd and 3rd trimesters[20].However, this fact contradicts the guidance of the MS, which recommends screening in the 1st and 3rd trimesters, on admission for childbirth and abortions[6].

An ecological study ran by Figueiredo et al. (2020)[21], which analyzed data referring to primary care for syphilis, observed that, the more offerings of the rapid test, the greater ability to detect the disease and the consequent reduction in the rates of CS.This study analyzed data from 5,570 Brazilian municipalities, and showed that the diagnostic actions for syphilis were made available in more than 95% of the evaluated municipalities. Also, the number of rapid tests available increased from 31,500 in 2011 to 3,156,410 in 2014. However, it states that the distributions related to the estimate of pregnant women in the states were uneven and disproportionate. In addition, about 1/3 of the teams did not offer a quick test, pointing out that it would be necessary to expand this measure[21].Thus, it is concluded that the tests are performed incorrectly and ineffectively in primary care.

Treatment in case of syphilis reported in pregnant women in primary care

The treatment of syphilis in pregnant women is well known and solidified in the scientific literature. In cases of primary, secondary and recent latent syphilis (with less than 1 year of evolution), the therapeutic regimen consists of the use of *Penicillin G Benzathine* as early as possible, since there is no evidence of other drugs that are effective in pregnant women. Recommended doses vary according to the diagnosis of recent or late infection. In this sense, if the diagnosis occurs in the primary and secondary phases, 2,400,000IU are used, with application divided in each gluteus. In late diagnoses, in an undetermined latent phase, 7,200,000IU of the drug is used, divided into 3 weeks of gluteal injections of 2,400,000IU[4].

Infected pregnant women need to be identified and must receive effective treatment immediately. Screening and treatment of partners is also of fundamental importance[9]. In 2012, the WHO set a goal to treat more than 80% of partners of pregnant women with syphilis with at least one dose of *Penicillin G Benzathine*[22].However, data from the Notifiable Diseases Information System (SINAN) show that only 11.5% of sexual partners were treated for syphilis in Brazil in 2011[18]. This data points to one of the challenges in the eradication of congenital syphilis and reinfection of pregnant women, as well as the difficulty of actively seeking partners for primary care.

Analysis of a 2014 study showed that, in 1,117 municipalities in the country with more than 20,000 inhabitants and with primary care coverage greater than 50%, the median use of benzathine Penicillin was 41.9% only, with regional disparities present. Data also reveal great regional variability. In the Southeast and Northeast regions of the country, less than 50% of the cities studied applied penicillin to more than half of their teams, which reduces access to treatment and perpetuates transmission[21].

Benzaken et al. (2020)[23]performed a similar analysis for the 27 capitals of the country, and also found a situation of low adequacy of primary care. In this case, the median obtained in relation to the availability of penicillin was 67.7%, and the median of its administration by the team was 86.7%.

Regarding the proper use of treatment, a cross-sectional study by Oliveira et al. (2020)[17]found out that, among 126 pregnant women diagnosed with gestational syphilis, only 1.6% had adequate treatment, and only 16.3% received concomitant treatment with their partner, which calls attention to the need for greater training of the primary care team in case management of syphilis in pregnant women.

In addition, a survey conducted in 23 UBS in 2017 states that 69.7% of local health professionals would perform the treatment of partners of pregnant women infected with *Treponema pallidum* and would verify their treatment. However, the study shows that 69.4% of partners were not treated. In addition, of the total number of professionals, 58.7% were unaware of the different clinical stages of the disease, which reveals a problem as the treatment is different at each stage[20].

Thus, the compromise of adequate treatment of gestational syphilis covers the following spheres: poor availability of the drug in health units and unpreparedness of health professionals to request an examination and to guide and treat pregnant women and their partners. In such a way, since there is a lack of consensus regarding protocols for this disease, many pregnant women do not follow the treatment adequately[20], which demonstrates erroneous behavior regarding the evaluation of their test results.

Measures to prevent vertical transmission

One of the preventive measures against vertical transmission of syphilis is the educational approach directed to all primary care health professionals, where the diagnosis and treatment of gestational syphilis is carried out, and to the protagonists of maternal and child care[11].Health education is an imperative preventive measure, as studies show a high prevalence of professional behaviors that are contradictory to what is protocoled[17,20,21,23].

Analysis conducted by Costa et al. (2018)[20], demonstrates that 72.1% of the health professionals in the study had worked for more than five years and, even so, had difficulty in diagnosing and treating the disease in pregnant women. This shows the lack of effective training for healthcare professionals correlates with the higher incidence of congenital syphilis.

Study run by Lazarini et al. (2017)[11]demonstrates that an effective way of educational intervention would be the offering of workshops focused on syphilis diagnosis and management. The same evidenced a significant increase in knowledge about the proper and effective professional conduct in prenatal care after the administration of this

type of strategy. He also noted an explicit improvement in knowledge about recommended therapeutic strategies and procedures related to the control and monitoring of gestational syphilis. This type of approach proved to be effective, as there was a 38% reduction in vertical transmission of the disease.

Similar measures were incorporated into the SUS Strategic Actions Agenda, released in 2017 by the MS[24], which advocated educational dissemination on the prevention, diagnosis and treatment of syphilis, in addition to the inclusion of the thematic axis in the training programs for health professionals and expanded training for them. However, data show that infant mortality in Brazil due to syphilis increased from 2.4/100,000 in 2005 to 7.4/100,000 births in 2015, a rate that remains high to the present day[25]. Therefore, these facts indicate fragility and insufficiency in prenatal care towards gestational syphilis.

Data presented about the approach, treatment and prevention are reunited in Table 2.

Discussion

The high rates of syphilis during pregnancy and consequently increasing rates of congenital infection have, despite well-established treatment, become an emerging public health problem in the national context[9]. America is known to have the highest incidence of syphilis, accounting for 25% of 2 million cases of gestational syphilis annually. The prevalence of syphilis in Latin America, the Caribbean, the United States (USA) and Canada varies from 0.0% to 7.0%, and in Brazil it reaches 1.4 to 2.8%[26]. In the USA, the incidence of congenital syphilis reaches 0.134/1000 live births. In Brazil, it reaches 8.2/1000 live births[8]. In countries like the United Kingdom, about 2 babies are born with congenital syphilis per year. This low frequency is due to the massive control that exists for testing for infections during pregnancy. Similar rates are observed in countries such as France and Switzerland[27].

In Brazil, it is observed that primary care for syphilis during pregnancy has a few shortcomings, which are: the testing on pregnant women done at inappropriate times and in a deficient way, without following through the tests during the consultations, or in an expanded way, performing them more than necessary[20,21,27].

In addition, despite the greater availability of tests, it was seen that there is a poor distribution of these, which is disproportionate to the number of pregnant women in each state[21].

Furthermore, bearing in mind that pregnant women may be in latent stages of infection, and that most newborns are asymptomatic at birth[2,3],detection is even more difficult, making the diagnosis often late, at the time of birth or months after that[17].

Finally, there is inadequate availability of penicillin G benzathine in the UBSs and maternity hospitals, lack of preparation of health professionals to carry out the treatment properly in pregnant women and their partners, in addition to the non-commitment of pregnant women, who often do not follow up the treatment. The lack of care protocols also leads to the adoption of different therapeutic options[20]. Despite national programs such as "*RedeCegonha*" and the "Agenda of Strategic Actions for the Reduction of Syphilis in Brazil", which aim to expand the offer of diagnosis and treatment of patients with syphilis, it is clear that there are no more assertive programs focused on mitigating the transmission of congenital syphilis. Thus, the incidence rates of this disease remain too high, since such combat programs are usually filed and have insufficient actions[28].

Conclusion

It can be concluded, from the present study, that primary care for gestational syphilis in Brazil has important obstacles to its effectiveness in terms of improving prenatal care, as well as in the investment of qualification for the health professionals involved and the creation of specific health programs combating congenital syphilis. Such improvements are urgent, indispensable, and can change the panorama of national maternal and child health.

Table 2. Resumo dos resultados apresentados.

Time of diagnosis	69% in the 3rd trimester, 39.5% at birth and 3.9% after birth[17].
Prenatal care	40% started only after the 12th week[18].
Syphilis test	41.1% had the 2nd test registered[18]. 45% had 2 or more exams[19].
Penicillin availability and treatment	41,9%: Median use of Penicillin[21]. 86,7%: Median administration of Penicillin[23]. 1.6% of pregnant women received adequate treatment[17].
Partner treatment	16.3% of partners were treated[17]. 69.4% of partners were not treated[20].
Preventive measures	72.1% of UBS health professionals did not know how to properly treat the disease[20].

Source: Elaborated by author; 2023.

Contribuição dos Autores

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