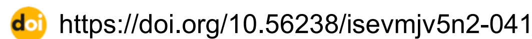
INTERNATIONAL SEVEN JOURNAL
OF MULTIDISCIPLINARY
ISSN: 2764-9547

CARE PROTOCOLS AND PHARMACOLOGICAL MANAGEMENT IN THE TREATMENT OF CONGENITAL SYPHILIS

PROTOCOLOS ASSISTENCIAIS E MANEJO FARMACOLÓGICO NO TRATAMENTO DA SÍFILIS CONGÊNITA

PROTOCOLOS ASISTENCIALES Y MANEJO FARMACOLÓGICO EN EL TRATAMIENTO DE LA SÍFILIS CONGÉNITA



https://doi.org/10.56238/isevmjv5n2-041

Receipt of originals: 03/28/2026 **Acceptance for publication:** 04/28/2026

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ABSTRACT

Congenital Syphilis (CS) is a fully preventable condition resulting from the vertical transmission of Treponema pallidum from an infected and inadequately treated pregnant woman to the fetus, leading to severe gestational outcomes such as fetal/neonatal death and serious clinical manifestations in the newborn. In light of the alarming reemergence of CS, disease control depends on the effectiveness of care protocols and immediate pharmacological management. The present study is a narrative literature review aimed at synthesizing scientific evidence on the management of CS, using the descriptors "Syphilis, Congenital" and "Therapeutics" in the PubMed database. The main strategy for eradication is universal screening of pregnant women during prenatal care (treponemal tests and VDRL). The standard pharmacological management for pregnant women is Benzathine Penicillin G, and it is crucial that maternal treatment be completed at least 30 days before delivery to be considered adequate for the fetus. The persistence of the disease is linked to multifactorial failures, including gaps in prenatal care, health inequities, stigma, and low adherence of sexual partners to treatment. Neonatal treatment is performed with Crystalline Penicillin G or Procaine Penicillin. It is concluded that treatment success goes beyond the pharmacological act, requiring a comprehensive care protocol within a healthcare network, with strengthening of public policies and health education in order to interrupt the cycle of vertical transmission.

Keywords: Congenital Syphilis. Penicillin. Vertical Transmission. Care Protocols. Prenatal Care.

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INTERNATIONAL SEVEN JOURNAL OF MULTIDISCIPLINARY
ISSN: 2764-9547

RESUMO
A Sífilis Congênita (SC) é uma condição inteiramente evitável, resultante da transmissão vertical do Treponema pallidum da gestante infectada e inadequadamente tratada para o feto, o que acarreta desfechos gestacionais severos, como óbito fetal/neonatal e manifestações clínicas graves no recém-nascido. Diante da reemergência alarmante da SC, o controle da patologia depende da eficácia dos protocolos assistenciais e do manejo farmacológico imediato. O presente estudo é uma revisão bibliográfica narrativa que objetivou sintetizar as evidências científicas sobre o manejo da SC, utilizando os descritores "Syphilis, Congenital" e "Therapeutics" na base de dados PubMed. A principal estratégia para erradicação é a triagem universal das gestantes no pré-natal (testes treponêmicos e VDRL). O manejo farmacológico padrão para a gestante é a Penicilina G Benzatina, sendo crucial que o tratamento materno seja concluído no mínimo 30 dias antes do parto para ser considerado adequado para o feto. A persistência da doença está ligada a falhas multifatoriais, incluindo lacunas no pré-natal, iniquidades em saúde, estigma e baixa adesão ao tratamento dos parceiros sexuais. O tratamento do neonato é realizado com Penicilina G Cristalina ou Procaína. Conclui-se que o sucesso do tratamento transcende o ato farmacológico, exigindo um protocolo assistencial de rede, com fortalecimento das políticas públicas e da educação em saúde, a fim de interromper o ciclo de transmissão vertical.

Palavras-chave: Sífilis Congênita. Penicilina. Transmissão Vertical. Protocolos Assistenciais. Pré-natal.

RESUMEN
La Sífilis Congénita (SC) es una condición completamente prevenible, resultante de la transmisión vertical de Treponema pallidum de una gestante infectada y tratada de manera inadecuada al feto, lo que ocasiona desenlaces gestacionales severos, como muerte fetal/neonatal y manifestaciones clínicas graves en el recién nacido. Ante la alarmante reemergencia de la SC, el control de la enfermedad depende de la eficacia de los protocolos asistenciales y del manejo farmacológico inmediato. El presente estudio es una revisión bibliográfica narrativa que tuvo como objetivo sintetizar la evidencia científica sobre el manejo de la SC, utilizando los descriptores "Syphilis, Congenital" y "Therapeutics" en la base de datos PubMed. La principal estrategia para su erradicación es el tamizaje universal de las gestantes durante el control prenatal (pruebas treponémicas y VDRL). El manejo farmacológico estándar para la gestante es la Penicilina G Benzatina, siendo crucial que el tratamiento materno se complete al menos 30 días antes del parto para ser considerado adecuado para el feto. La persistencia de la enfermedad está relacionada con fallas multifactoriales, incluyendo deficiencias en el control prenatal, inequidades en salud, estigma y baja adherencia al tratamiento por parte de las parejas sexuales. El tratamiento del neonato se realiza con Penicilina G Cristalina o Penicilina Procaína. Se concluye que el éxito del tratamiento trasciende el acto farmacológico, requiriendo un protocolo asistencial integral dentro de una red de atención, con el fortalecimiento de las políticas públicas y de la educación en salud, con el fin de interrumpir el ciclo de transmisión vertical.

Palabras clave: Sífilis Congénita. Penicilina. Transmisión Vertical. Protocolos Asistenciales. Control Prenatal.

1 INTRODUCTION

Congenital syphilis (CS) is the result of vertical transmission of the *Treponema pallidum* spirochete from the infected and untreated (or inadequately treated) pregnant woman to the fetus, occurring predominantly transplacentally (Salomè et al., 2024; d'Hemecourt et al., 2024). Despite being an entirely preventable condition through prenatal screening and timely treatment, CS is experiencing an alarming reemergence in several parts of the world, including high-income countries such as the United States and developing nations (Salomè et al., 2024; Tannis et al., 2024). The consequences of fetal infection are severe, including miscarriage, stillbirth, neonatal death, prematurity, and severe clinical manifestations in the newborn, such as bone, neurological, and sensory changes (Salomè et al., 2024; Pascoal et al., 2023).

The control of CS depends on the effectiveness of care protocols that integrate early diagnosis in pregnant women and immediate pharmacological management. The failure to control this pathology is multifactorial, involving gaps in the quality of prenatal care, barriers to access to the health system, and deficiencies in the training of health professionals (FEBRASGO, 2024; Pascoal et al., 2023). Currently, benzathine penicillin remains the only pharmacological agent capable of crossing the placental barrier in therapeutic concentrations sufficient to treat the fetus and prevent the complications of syphilis (FEBRASGO, 2024; Fuertes de Vega et al., 2024). In view of this scenario of resurgence of the disease, the analysis of management protocols and risk factors associated with vertical transmission is essential to support more assertive public health strategies (d'Hemecourt et al., 2024; Salomè et al., 2024).

Congenital syphilis continues to be an important public health problem due to its high morbidity and mortality rate, especially when not treated properly, congenital syphilis can lead to fetal or neonatal death in about 40% of cases. Among the remaining 60%, two-thirds of newborns are asymptomatic at birth. Clinical manifestations are divided into: Early (< 2 years): mucocutaneous involvement, pemphigus palmoplantar, rhinitis, jaundice, lymphadenopathy, meningitis, nephrotic syndrome, hemolytic anemia, prematurity, and bone lesions. Late (> 2 years): deafness, interstitial keratitis, dental changes, bone lesions, and neurological or gummy involvement (Fuertes de Vega et al., 2024).

Vertical transmission of syphilis is a complex phenomenon, influenced both by the stage of maternal infection and by the moment of pregnancy in which it occurs. Although

INTERNATIONAL SEVEN JOURNAL OF MULTIDISCIPLINARY
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vertical transmission can occur at any gestational period or stage of syphilis, the highest risk is found in newborns of mothers with primary or secondary infection, when spirochetemia is highest. In addition, it is observed that the probability of vertical transmission increases when maternal infection is acquired in more advanced stages of pregnancy. The transmission rate can vary between 60% and 100% in cases of primary or secondary infection. In the early latent phase, this percentage reduces to about 40%, reaching less than 8% in the late latent phase (d'Hemecourt et al., 2024).

This situation is explained by the higher concentration of the microorganism in the maternal bloodstream at this stage of infection. Even so, syphilis in the latent phase, both early and late, also implies a risk of transplacental transmission, although with a lower incidence than that observed in the initial symptomatic phases. When considering all phases of the disease, it is estimated that between 62% and 80% of cases of untreated maternal syphilis may result in adverse gestational outcomes, including miscarriage and fetal death (21% to 26%), neonatal death (6% to 11%), congenital syphilis (9% to 25%), and prematurity or fetal growth restriction (11% to 18%) (Febrasgo, 2024).

2 METHODOLOGY

The present study is characterized as a narrative literature review, developed with the objective of synthesizing and analyzing the most recent scientific evidence related to care protocols and pharmacological management in the treatment of congenital syphilis. The search was carried out in the PubMed database, using the descriptors "Syphilis, Congenital" and "Therapeutics", combined through the Boolean operators AND and OR, according to the terminology of Medical Subject Headings (MeSH). Articles published in the last five years, fully available and written in Portuguese or English, that directly addressed the topic were included. Studies that did not have a direct relationship with the central theme, duplicate publications, narrative reviews with low methodological rigor, and articles not indexed in the database used were excluded. The selection of studies was conducted in two stages: screening of titles and abstracts, followed by the evaluation of full texts to confirm relevance. The information extracted was organized descriptively.

3 RESULTS

The scientific literature indicates that the primary strategy for the eradication of congenital syphilis is universal screening of pregnant women. Care protocols recommend

that treponemal and non-treponemal tests (such as VDRL) be performed in the first and third trimesters of pregnancy, at the time of admission for delivery, and in cases of fetal death (FEBRASGO, 2024; d'Hemecourt et al., 2024). The standard pharmacological management for infected pregnant women is Benzatine Penicillin G, whose dosage varies according to the stage of infection: a single dose of 2.4 million IU for primary, secondary, or early latent syphilis, and three weekly doses (totaling 7.2 million IU) for late latent syphilis or syphilis of unknown duration (FEBRASGO, 2024; Fuertes de Vega et al., 2024).

A critical finding in recent epidemiological studies is the correlation between the timing of treatment and efficacy in preventing CS. For maternal treatment to be considered appropriate for the fetus, it must be completed at least 30 days before delivery (Tannis et al., 2024; FEBRASGO, 2024). Data from the United States reveal that approximately 51% of CS cases occurred in mothers who were diagnosed but did not receive timely or complete treatment, while 37% of mothers did not have access to prenatal care or started follow-up late (Tannis et al., 2024). In addition, the treatment of sexual partners is a vital component of the care protocol to prevent maternal reinfection, although adherence rates to this measure remain unsatisfactory (FEBRASGO, 2024; Pascoal et al., 2023).

In the newborn, the diagnostic evaluation after intrauterine exposure should include a thorough physical examination and, depending on the risk classification, complementary tests such as long bone X-ray, cerebrospinal fluid (CSF) analysis, and blood count (Salomè et al., 2024). Pharmacological treatment of neonates with confirmed or highly probable congenital syphilis is performed with Crystalline Penicillin G or Procaine, depending on the presence of CSF changes (Salomè et al., 2024; d'Hemecourt et al., 2024).

The clinical management of congenital syphilis requires a careful approach, involving early diagnosis, appropriate treatment, and continuous follow-up of exposed newborns. Therefore, those who meet the criteria for congenital syphilis or who are suspected of being infected should be investigated for the presence of neurosyphilis and treated with aqueous crystalline penicillin G. Therefore, evaluation by a specialist in pediatric infectious diseases is recommended in order to assist in the interpretation of the tests and in the definition of the most appropriate therapeutic approach. All neonates with a reactive RPR test at birth should repeat the test every two to three months, until a non-

reactive result is obtained. In cases not diagnosed in childhood, late manifestations may include ocular changes, sensorineural hearing loss, Hutchinson's teeth, and bone changes in the midline of the face or lower limbs (d'Hemecourt et al., 2024).

4 DISCUSSION

The discussion about the management of congenital syphilis reveals a paradox: it is a disease with cheap and accessible diagnosis and cure, but which continues to overload health systems (FEBRASGO, 2024; d'Hemecourt et al., 2024). The increase in global incidence rates — far exceeding the World Health Organization's goal of less than 50 cases per 100,000 live births — highlights structural flaws in epidemiological surveillance (Salomè et al., 2024). The literature reinforces that the simple prescription of penicillin is not enough if there is no system for active search for partners and strict monitoring of the drop in VDRL titers after treatment (FEBRASGO, 2024).

A central point of debate refers to health inequities. Patients with less education, without a steady partner, or with a history of illicit substance use are at higher risk of adverse outcomes and treatment failure (Pascoal et al., 2023; Tannis et al., 2024). The stigma associated with sexually transmitted infections (STIs) still acts as a barrier to testing and early treatment (d'Hemecourt et al., 2024). In addition, the exclusive dependence on benzathine penicillin makes the control of the disease vulnerable to periods of global scarcity of the drug, requiring strategic reserve policies (FEBRASGO, 2024).

In short, the success of the treatment of congenital syphilis transcends the pharmacological act; it requires a network care protocol, where the maternal diagnosis is translated into an immediate intervention, 30 days before the gestational outcome, ensuring that the transmission cycle is interrupted (Tannis et al., 2024; Fuertes de Vega et al., 2024). When not performed at least 30 days before birth, the risk of serious perinatal problems is increased, such as prematurity, low birth weight, fetal and neonatal death (Tannis et al., 2024). The prognosis for affected children improves significantly with early intervention, but the eradication of CS remains one of the greatest contemporary public health challenges (Salomè et al., 2024; Pascoal et al., 2023).

5 CONCLUSION

The present narrative literature review study synthesized the scientific evidence on care protocols and pharmacological management of Congenital Syphilis (CS), a completely preventable disease whose global reemergence represents a serious public health challenge. The findings reinforce that the primary strategy for the eradication of CS is universal and timely screening of pregnant women in prenatal care, with benzathine penicillin G as the only effective maternal treatment for the fetus.

However, the maintenance of high incidence rates demonstrates that the problem transcends the pharmacological act. The persistence of CS is intrinsically linked to structural flaws in epidemiological surveillance and complex health inequities, including barriers to access to prenatal care, the stigma associated with Sexually Transmitted Infections (STIs), and low adherence to treatment by sexual partners. Such gaps result in more than half of CS cases occurring in pregnant women who were diagnosed but did not complete treatment in time (minimum of 30 days before delivery).

It is concluded that the effective control of Congenital Syphilis requires the urgent consolidation of a network care protocol, capable of articulating early diagnosis with an immediate intervention and rigorous active search for partners. Success in interrupting the cycle of vertical transmission depends on the continuous strengthening of public policies, health education, and the confrontation of social and logistical barriers, so that the favorable prognosis offered by penicillin is universally guaranteed. The eradication of CS, although challenging, remains an achievable goal through a systemic and integral commitment.

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