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Dual Threat: Neurosyphilis and Congenital Syphilis in a 3-Month-Old Infant

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Abstract

Congenital syphilis is a result of mother-to-child transmission (MTCT) of syphilis during pregnancy. The outcomes of MTCT may range from an array of clinical manifestations to serious consequences like perinatal mortality due to miscarriage, stillbirth, and neonatal death, and an increased risk of preterm and low-birthweight infants. Neurosyphilis is supposed to occur in as high as 60% cases of congenital syphilis, diagnosed based on various cerebrospinal fluid abnormalities; however, this is underreported. Maternal screening and treatment for syphilis during pregnancy remains the cornerstone of congenital syphilis prevention. We report a case of congenital syphilis with neurosyphilis in a 3-month-old boy, born to a 20-year-old mother who never attended antenatal services

Key words: congenital syphilis, maternal syphilis, neurosyphilis

Introduction

Congenital syphilis is caused by transmission of the spirochete *Treponema pallidum* from mother to fetus during pregnancy and/or childbirth. This may result in perinatal mortality or diverse clinical manifestations in those who survive. In 2020, the global rate of congenital syphilis was 425 cases per 100,000 live births, which was significantly higher than the elimination target of 50 cases per 100,000 live births set by the WHO.[1] This can be correlated with the fact that number of new cases of syphilis in adults aged 15–49 years, which rose globally from 7.1 million in 2020 to 8.0 million in 2022.[2] The occurrence of neurosyphilis in congenital syphilis is believed to be as high as 60%.[3] Diagnosis of neurosyphilis in congenital syphilis is confirmed by cerebrospinal fluid abnormalities, namely reactivity on a Venereal Disease Research Laboratory (VDRL) test, pleocytosis, and elevated protein content.3 The diagnosis of congenital syphilis can be difficult at times due to the presence of maternal antibodies in the newborns; hence, the diagnosis often focuses on maternal syphilis.[4] Maternal screening and timely treatment for syphilis during pregnancy are invaluable in preventing of congenital syphilis and its consequences.

This case report aims to highlight the clinical presentation and diagnostic features of congenital neurosyphilis in a 3-month-old male infant born to a 20-year-old mother who did not attend antenatal care. The infant presented with multiple systemic and cutaneous findings suggestive of congenital infection. Both mother and child tested positive for VDRL and TPHA, and cerebrospinal fluid analysis in the infant revealed pleocytosis and reactive VDRL, confirming neurosyphilis. The patient was treated with intravenous ceftriaxone due to unavailability of aqueous crystalline penicillin. This case underscores the preventable nature of congenital syphilis and stresses the need for routine maternal screening and timely treatment during pregnancy to reduce the risk of vertical transmission and associated morbidity.

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Case Report

A 3-month-old boy presented with a reddish skin lesion on the left leg and swelling of the left thigh since birth. The lesion progressively extended from the left leg to the abdomen and bilateral extremities within period of 1 month, but was never associated with any fluid-filled skin lesions. He was born to a 20-year-old female by vaginal delivery at home, with a birth weight of 2 kg. The mother gave a history of painless genital lesions during the eighth month of pregnancy, for which she did not seek medical advice and the lesion subsided on its own.

Cutaneous examination of the baby revealed multiple hypopigmented and erythematous plaques covered with scales over trunk and bilateral extremities. In addition, a few erosive plaques were observed on the trunk, buttocks, and limbs. On neurological examination revealed normal tone, with no bulging anterior fontanelle, normal deep tendon reflexes. Per abdomen examination there was hepatosplenomegaly. The infant had pallor but no palpable lymph nodes. No history of snuffles. His weight at presentation was 3.5 kg.

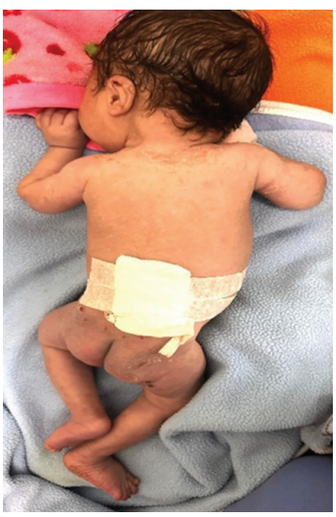

Figure 1 : Clincal photograph showing mutiple hypopigmented to erythematous plaque present over back with bluish patch present over buttock area

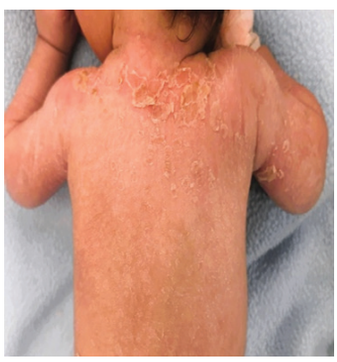

Figure 2: Clinical photograph showing mutiple hypopigmented to erythematous plaque with scales present over back, bilateral upper and lower limbs

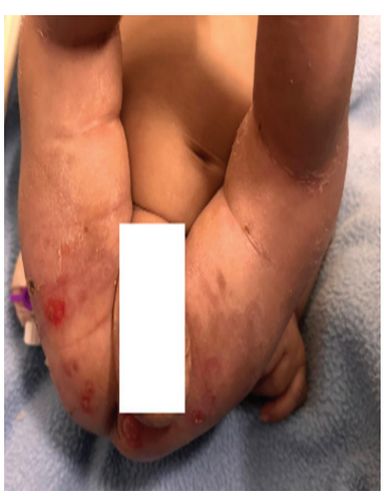

Figure 3: Clinical photograph showing well defined hyperpigmented plaque with scales with erosion present on perineal area

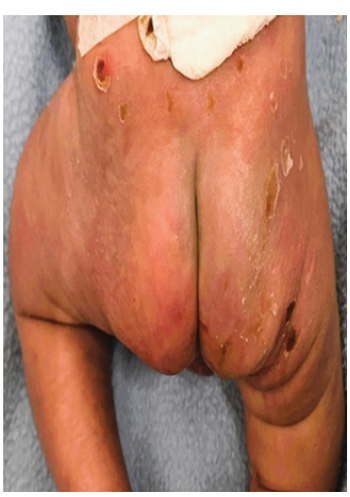

Figure 4: Clinical photograph showing erythematous to hyperpigmented plaque with scales with few crusted plaque present over the buttock area

The mother's *Treponema pallidum* hemagglutination assay (TPHA) was positive. The rapid plasma reagin (RPR) test in the mother was reactive at a titer of 1:8. Serologic screening in the infant showed positive syphilis ELISA and a significantly elevated RPR titer of 1:32.

The CSF white blood cell (WBC) count of 5/mm^3, though at the upper limit of normal for a 3-month-old infant, was considered indicative of mild pleocytosis in the clinical context of reactive CSF VDRL and systemic features of congenital syphilis. The presence of pleocytosis reflects inflammatory involvement of the central nervous

system. The CSF protein level was elevated at 66 mg/dL, further supporting intrathecal inflammation consistent with neurosyphilitic involvement. The CSF VDRL test was reactive at a titer of 1:16, which is highly specific and considered diagnostic for neurosyphilis, serving as the cornerstone for confirmation of CNS involvement. Although the CSF red blood cell (RBC) count was 200/mm³, likely due to a traumatic lumbar puncture, it may have minimally influenced the protein and WBC levels; However, this does not diminish the diagnostic significance of the reactive CSF VDRL and elevated protein levels in establishing neurosyphilis. Overall, these CSF findings, in conjunction with serologic evidence and clinical features, confirmed the diagnosis of congenital neurosyphilis.

Initial laboratory tests showed anemia (hemoglobin: 8.5 g/dL) with raised C-reactive protein (CRP). Ultrasonography (USG) of the abdomen and pelvis revealed multiple hypoechoic lesions in the liver, likely representing treponemal-induced inflammation. X-ray imaging of the bilateral hips and thighs demonstrated hyperostosis of the long bones, which can be attributed to periosteal inflammation triggered by treponemal infection, resulting in reactive new bone formation. Together, these imaging findings support systemic involvement of congenital syphilis, correlating with the multisystem manifestations observed clinically.

These findings indicated towards a diagnosis of congenital syphilis with neurosyphilis, accompanied by anemia and failure to thrive. The baby was managed with a 14-day course of intravenous ceftriaxone due to the unavailability of intravenous aqueous penicillin G. No follow-up cerebrospinal fluid (CSF) analysis was performed after treatment to document resolution of neurosyphilis. While clinical improvement and decline in serologic titers (RPR) suggest treatment efficacy, the absence of post-treatment CSF evaluation limits the objective confirmation of CNS recovery. Future management of similar cases would benefit from serial CSF monitoring to more accurately assess treatment response and guide ongoing care.

Discussion:

Despite the knowledge about the magnitude of disease and development of preventive strategies, congenital syphilis still remains a major health problem globally. As per the World Health Organization (WHO) syphilis estimates, there has been global increase in the number of new cases of syphilis among adults aged 15–49 years, reaching 8 million in 2022.[2] This rising prevalence among individuals of reproductive age poses a direct threat to the increase in congenital syphilis cases.

Unlike syphilis in adults, the spirochete *(Treponema pallidum)* is directly released to the bloodstream leading to spread to vital organs and inflammation resulting in various clinical manifestations in congenital syphilis.[4] The outcomes of this infection are serious, with a perinatal mortality rate of almost 40% due to abortion, stillbirth, and neonatal death. Only 15% of live-born infants are symptomatic.[5]

As high as 60% of congenital syphilis cases have neurosyphilis, contributing to increased morbidity and mortality among the infected.[3] Importantly, congenital syphilis is both preventable and treatable, provided there is timely pre- and perinatal screening, followed by the appropriate maternal treatment. The WHO and CDC have recommended routine serological screening of pregnant women during the first prenatal visit, at 28 weeks of gestation, and at delivery for women at risk of acquiring syphilis during pregnancy.[4] Despite the guidelines set by the WHO for maternal screening during pregnancy and its implementation at national level, in our case, the mother did not seek antenatal care during pregnancy, though she had history of some genital lesion. This lacuna is possibly due to a lack of information, education, and/or availability of services.

Nevertheless, there have been few cases of congenital syphilis reported in infants born to mothers adequately treated for syphilis as per the CDC guidelines. Rajakumari et al., reported a case of congenital syphilis in an infant born to mother who was diagnosed with latent syphilis of unknown duration at 34 weeks of gestation and was adequately treated with benzathine penicillin as per the CDC guidelines. Although the infant had no clinical or radiological signs of congenital syphilis, a VDRL titer of 1:64 prompted treatment for congenital syphilis.[6] Similarly, Nelson et al., also reported congenital syphilis in four infants whose mothers were adequately treated during pregnancy and all four had radiographic findings of congenital syphilis.[7] Thorough maternal history and complete physical evaluation of infant at birth was recommended for all neonates born to mothers diagnosed with and treated for syphilis.[7] Congenital syphilis may be asymptomatic, particularly during the first few weeks of life and appearance of clinical manifestations may be delayed till second year of life.[4] Additionally, transfer of maternal nontreponemal and treponemal immunoglobulin G (IgG) antibodies through placenta to the fetus may complicate the interpretation of reactive serologic tests for syphilis among newborns.[8] However, in the absence of clinical manifestations, radiological findings are helpful as reported by Nelson et al., which stands true in our case as well.

Michelow IC et al., stated that congenital syphilis with neurosyphilis can present with a wide range of clinical features, necessitating careful differentiation from other neonatal infections. Neonatal meningitis caused by *Group B Streptococcus, E. coli, or Listeria monocytogenes* may present with fever, irritability, and poor feeding, but CSF findings typically show neutrophilic predominance and low glucose, unlike syphilitic pleocytosis and reactive CSF VDRL.[3] Leslie SW & Vaidya R et al.,stated herpes simplex virus infection

may mimic neurosyphilis with seizures, lethargy, or vesicular lesions, but PCR testing distinguishes the viral etiology.[4] Rajakumari et al., stated that other congenital infections such as toxoplasmosis, rubella, and cytomegalovirus may show hydrocephalus, chorioretinitis, or hepatosplenomegaly, but serology and PCR tests help differentiate these conditions.[6]

Clinically, congenital syphilis may present early with features such as snuffles, rash on palms and soles, hepatosplenomegaly, perioral rhagades, and skeletal changes like saber shins, while neurosyphilis can manifest as seizures, bulging fontanelles, cranial nerve palsies, papilledema, hydrocephalus, and developmental delay. The presence of a reactive CSF VDRL, along with pleocytosis and elevated protein, is highly specific for neurosyphilis and remains the cornerstone of diagnosis

Monitoring the decline of Rapid Plasma Reagin (RPR) titers is a cornerstone in evaluating treatment response for congenital syphilis in infants. According to the Centers for Disease Control and Prevention (CDC), all neonates with reactive nontreponemal tests should undergo thorough follow-up examinations and serologic testing (i.e., RPR or VDRL) every 2–3 months until the test becomes nonreactive. A fourfold decrease in RPR titer over 12 months post-treatment is generally considered indicative of adequate therapy. If titers remain persistently elevated or fail to decrease appropriately, further evaluation, including cerebrospinal fluid (CSF) analysis, is recommended.[8]

The CDC recommends aqueous crystalline penicillin G 200,000–300,000 units/kg body weight by IV, administered as 50,000 units/kg body weight every 4–6 hours for 10 days for management of congenital syphilis in infants and children. In cases of shortage of penicillin, ceftriaxone 75 mg/kg body weight/day IV or IM in a single daily dose for 10–14 days is also recommended.[8] Our case was managed with a 14-day course of intravenous ceftriaxone due to the unavailability of intravenous aqueous penicillin G.

Conclusion

Major factors contributing to congenital syphilis are lack of antenatal care, inadequate screening of pregnant women and delayed antenatal treatment. Thorough maternal history of syphilis infection and treatment is crucial so is the detailed evaluation of the newborn for congenital syphilis and concurrent neurosyphilis. Timely detection and treatment of syphilis in pregnancy reduces the prevalence of congenital syphilis, whereas timely diagnosis and treatment of congenital syphilis reduces morbidity and mortality in newborn.

References

1. Moseley P, Bamford A, Eisen S, Lyall H, Kingston M, Thorne C, et al. Resurgence of congenital syphilis: new strategies against an old foe. Lancet Infect Dis. 2024 Jan;24(1):e24-35. https://doi.org/10.1016/S1473-3099(23)00314-6
2. World Health Organization. WHO syphilis estimates. Global HIV, Hepatitis and STIs Programmes. WHO; 2024.
3. Michelow IC, Wendel GD Jr, Norgard MV, Zeray F, Leos NK, Alsaadi R, et al. Central nervous system infection in congenital syphilis. N Engl J Med. 2002 Jun 6;346(23):1792-8 https://doi.org/10.1056/NEJMoa012684
4. Leslie SW, Vaidya R. Congenital and maternal syphilis. In: StatPearls, Treasure Island (FL): StatPearls Publishing; 2025 Jan-. [Updated 2024 Aug 17; cited 2025 Oct 8]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537087/
5. The Lancet. Congenital syphilis in the USA. Lancet. 2018 Oct 6;392(10154):1168. https://doi.org/10.1016/S0140-6736(18)32360-2
6. Rajakumari RS, Gopinath SR, Mohan N, Sathyamoorthy D, Sumithra S. A congenital syphilitic child to an adequately treated syphilitic mother. Indian J Sex Transm Dis AIDS. 2021 Jan 1;42(1):75-7. https://doi.org/10.4103/ijstd.IJSTD_111_17
7. Nelson BD, Lawrence SM, Simek K, Stowers KB, Morales Moreno JE, Prince JS, et al. Are we playing it fast and loose with the serofast? Pediatr Infect Dis J. 2025 Feb 1;44(2):174-9. https://doi.org/10.1097/INF.0000000000004585
8. Centers for Disease Control and Prevention. Sexually transmitted infections treatment guidelines 2021 [Internet]. Atlanta (GA): CDC; [cited 2025 Jun 13]. Available from: https://www.cdc.gov/std/treatment-guidelines/congenital-syphilis.htm