# Congenital Syphilis: An Emerging Threat to Neonatal Health

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## Abstract

**Introduction:** Congenital syphilis (CS) is primarily caused by the transplacental delivery of the bacterium *Treponema pallidum*, which allows widespread distribution throughout fetal organ systems. The spirochete easily evades immature immune defenses, causing devastating damage to offspring. Given the 10-fold increase in national cases over the previous decade and mortality rate of nearly 40%, CS remains an important pathology to recognize and understand. This abstract presents a case report of an infant with proven CS.

**Case Presentation:**
*History of Present Illness:* Preterm male delivered by emergent caesarean section for placental abruption. Prenatal history was significant for fetal cardiac lesions and new onset and sustained seroreactive rapid plasma reagin (RPR; 1:16) in the third trimester despite prescribed maternal penicillin G therapy.

*Hospital Course:* No abnormalities were apparent on admission physical examination. Following initial stabilization, a complete diagnostic workup was conducted due to presumed maternal treatment noncompliance. Aqueous penicillin G therapy began within the first 24 hours through 10 days of life. Additional management was commensurate with the infant's degree of prematurity. Nontreponemal testing at two months of life demonstrated an effective response to penicillin treatment. Outpatient care coordination and adherence to follow-up were prioritized in the family's care plan.

*Social History:* Maternal history was significant for polysubstance abuse and possible medication noncompliance.

*Labs, Images, Studies:* Initial laboratory findings were significant for mild thrombocytopenia (109 thou/mcL) and an equivocal RPR (1:16). Skeletal survey demonstrated radiolucent bands across bilateral long bone metaphyses. Multiple cardiac granulomatous lesions were evident on echocardiography with reduced ventricular function. CSF values included a nonreactive venereal disease research lab (VDRL). Evolving mild direct hyperbilirubinemia (maximum 2.1 mg/dL) over the hospitalization warranted abdominal ultrasonography at six weeks of life, with no evidence of structural hepatobiliary abnormalities. Interval RPR testing at two months of life demonstrated an eightfold decrease in RPR titer to 1:2. Cardiac lesions remained unchanged, with improved cardiac function on subsequent echocardiograms.

**Discussion:** The likelihood of perinatal syphilis transmission is greatest during the primary and secondary stages of maternal infection, typically occurring between three weeks to three months following the initial exposure. Affected offspring may remain asymptomatic or manifest with common signs during the neonatal period, including growth restriction, non-immune hydrops fetalis, mucocutaneous lesions, rhinitis, hepatomegaly, osteochondritis, anemia, and thrombocytopenia. The

standard of care for infants born to mothers with syphilis begins with nontreponemal testing and physical examination. Further evaluation is indicated when infant titers are fourfold greater than maternal titers, or the physical examination is abnormal. A fourfold increase in infant versus maternal titers characterizes proven CS. However, an abnormal physical examination yields equal diagnostic value and warrants the same additional evaluation. Penicillin G is the only proven effective antimicrobial therapy for CS, and treatment regimens depend upon the likelihood of CS infection. Prompt identification and treatment are crucial to mitigate the risk of irreversible long-term complications, including hearing loss, ocular damage, neurodevelopmental impairment, and deformities of the face, teeth, and musculoskeletal system. Clinicians must maintain an ongoing knowledge of current syphilis guidelines to effectively expedite care.

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