

Congenital Syphilis

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BACKGROUND

Syphilis is caused by the spirochete bacterium, *Treponema pallidum*. It is predominantly transmitted by sexual contact with an infected lesion. Congenital Syphilis (CS) occurs via vertical transmission of *Treponema pallidum* from an infected mother to the infant in utero. CS can be acquired trans placentally as early as the 14th week of fetal development or by direct contact with a vaginal syphilitic lesion during delivery. If Syphilis is left untreated during pregnancy, it can lead to severe fatal neurological, developmental, and musculoskeletal impairments and fetal demise. Women with untreated primary or secondary syphilis are more likely to transmit syphilis to their fetus than women with latent syphilis.

PURPOSE

- To understand the pathophysiology, diagnosis, early detection and management of Congenital Syphilis.
- To understand the implications of CS on the infant.
- To understand the nurse's role in promptly identifying CS and the timely interventions needed to minimize sequelae.

METHODS

The CDC, American Academy of Pediatrics, and the American College of Obstetricians and Gynecologists endorse and recommend early and interval syphilis screening for all pregnant women. Women at high risk for syphilis should have repeat screening at 28 weeks gestation and during delivery. Tests used are nontreponemal (VDRL, RPR) antibody detection tests followed by a treponemal antibody detection test. Penicillin is the drug of choice for the treatment of maternal syphilis infection. Women with a positive result must receive timely treatment and interval follow-up, including a test of cure.

The paired maternal and neonatal serum quantitative nontreponemal test (VDRL or RPR) are considered first-line tests for possible or probable CS infection. The RPR or VDRL tests are considered positive if the neonate's test result is fourfold or greater than the maternal RPR/VDRL result.

Additional testing for neonates includes CSF analysis, CBC with differential, liver function tests, long bone and chest radiography, ophthalmologic examination and hearing evaluation. The standard care for neonates with CS is a total of 10 days of IV aqueous crystalline penicillin G therapy, 50,000 units/kg IV every 12 hours (0-7 days of life), or every 8 hours (> 7 days of life). A single IM dose of benzathine penicillin G 50,000 units/kg is given to neonates less likely to be affected by CS.



Checklist

- Examine the neonate for:
 - Face: Rhinitis (snuffles) with mucopurulent nasal discharge
 - Skin: Jaundice, rash and desquamation
 - Abdomen: Hepatosplenomegaly (enlarged liver and spleen)
 - Eye: Chorioretinitis and pigmentary chorioretinopathy (salt and pepper type), glaucoma, cataracts, interstitial keratitis, optic neuritis
- Additional clinical examinations:
 - Radiographs: Osteochondritis, diaphyseal osteomyelitis, periostitis.
 - Hearing test: Hearing impairment (failed hearing screening must be followed with diagnostic testing to verify hearing loss).
- Obtain maternal medical health and pregnancy history for syphilis diagnosis.
- Collect maternal and neonatal blood samples for laboratory testing (maternal titers rapid plasma reagin [RPR] and venereal disease research laboratory [VDRL], neonatal blood count and thrombocytopenia).
- As indicated, test cerebrospinal fluid (CSF) for reactivity for VDRL test, or elevated CSF cell count or protein.
- Use darkfield microscopy or fluorescent antibody detection to detect *Treponema pallidum* in relevant tissue samples.
- Obtain photographs of the congenital anomalies noted.

Congenital Syphilis in Nevada

In 2019 Nevada was ranked 1st for primary and secondary Syphilis and 4th for congenital syphilis rates. Most of the congenital cases were in Southern Nevada. Clark County had a total of 43 cases of CS in 2020.

RESULTS

Low socioeconomic status, maternal illicit drug use, particularly cocaine, methamphetamine and heroin, unstable housing and homelessness, ethnic disparities, unsafe sexual practices, inadequate treatment during pregnancy, and partial or no prenatal care due to limited access to medical care are associated with syphilis infection during pregnancy.

Rates of congenital syphilis have risen steadily in the US since 2012. In 2020 there were 57 cases per 100,000 live births. This represents the highest reported rate since 1991. In 2000, 2.12 per 100,000 cases were reported. By 2017 there were 23.3 cases per 100,000, cases have tripled by 291.1 percent between 2015 and 2019 alone.

Symptoms of CS infection include low birth weight, skin rashes, hepatosplenomegaly, anemia, and purulent nasal discharge (rhinitis). Comorbidities noted include musculoskeletal abnormalities and neurodevelopmental impairment. Late CS infection has onset after 2 years of age. Symptoms may include Hutchinson's triad (interstitial keratitis, Hutchinson teeth, and sensorineural hearing loss).

Syphilis infection can be prevented with education and awareness. This should begin at the onset of menarche with pediatric providers and continue throughout young adulthood and beyond.

CONCLUSIONS

Congenital Syphilis is on the rise in the United States despite being preventable with prenatal screening and adequate penicillin treatment. Timely treatment is necessary to minimize or eliminate mortality and morbidity. Perinatal and neonatal nurses and practitioners need to be vigilant that all mothers are screened for syphilis before the infant is discharged from hospital. Structured follow up care for the infant is essential and the plan of care needs to be communicated to the family. Discharge summary needs to be sent to the primary care physician to ensure appropriate follow up. Serologic nontreponemal testing needs to be done every 2-3 months until non reactive. Neurodevelopmental follow up is also necessary after discharge with increased risk of cerebral palsy, and speech-language and motor delays.

REFERENCES

Reference available upon request

