International Medical Case Reports Journal

Dovepress
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CASE REPORT

Too Late to Treat: Missed Antenatal Syphilis Screening and a Fatal Neonatal Outcome – A Case Report

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Introduction: Syphilis in pregnancy, caused by Treponema pallidum, can be vertically transmitted, leading to serious neonatal complications such as preterm birth, stillbirth, and neonatal death. Despite global efforts to reduce its prevalence, challenges such as inadequate antenatal screening and delayed treatment persist. Early diagnosis and treatment are crucial to preventing adverse outcomes.

Case Illustration: A 24-year-old pregnant woman (G3P2A0) was admitted at 29–30 weeks of gestation with premature rupture of membranes and labor contractions. She had been diagnosed with syphilis at 28 weeks but had not received treatment. The baby boy was delivered prematurely and suffered from severe asphyxia and respiratory distress, requiring resuscitation. Sadly, he passed away three hours after birth. The mother was discharged after receiving the first dose of syphilis treatment.

Conclusion: This case highlights the critical importance of early syphilis screening and timely treatment during pregnancy to prevent adverse maternal and neonatal outcomes. Delayed intervention in this case contributed to a poor prognosis. Comprehensive antenatal screening and prompt follow-up care are essential to reducing the risk of congenital syphilis and its complications.

Keywords: syphilis, pregnancy, early screening, treatment, neonatal complications

Introduction

Syphilis in pregnancy refers to an infection caused by Treponema pallidum that occurs during gestation. It can be transmitted either through sexual contact or vertically across the placenta.[1] The rate of syphilis among mothers giving birth in the United States increased significantly from 87.2 to 280.4 per 100,000 births between 2016 and 2022.[2] The World Health Organization (WHO) estimated that by 2022, approximately 8 million adults would be infected with syphilis.[2] In Indonesia, according to Profil Kesehatan Indonesia 2023, the prevalence of syphilis among pregnant women was 0.48%.[3] However, only 36.5% of pregnant women underwent syphilis screening in 2022, falling short of the targeted coverage.[3] Moreover, while the prevalence slightly decreased from the previous year, the proportion of pregnant women receiving treatment declined from 50.1% in 2021 to 39.8% in 2022.[2,3]

According to the Indonesian Ministry of Health Regulation (Peraturan Menteri Kesehatan No. 52), the risk of mother-to-child transmission of syphilis is estimated at 69–80%. A retrospective cohort study (2007–2011) showed that maternal syphilis infection significantly increased the risk of gestational diabetes, preterm birth, and cesarean section.[4] Neonatal outcomes associated with maternal syphilis included an increased risk of NICU admission, congenital anomalies, stillbirth, and neonatal or infant death.[4] Cases of syphilis saw a rapid increase of 755% in the United States from 2012 to 2021.[5] According to the CDC, 88% of congenital syphilis cases in 2022 could have been prevented with timely screening and treatment.[5]

Several actions have been taken to break the chain of syphilis transmission.[6] The government has implemented various strategies to reduce the incidence of syphilis infections during pregnancy, including health promotion activities, health surveillance, early detection, and/or case management.[6] The American College of Obstetricians and Gynecologists (ACOG) recommends that all pregnant women be screened for syphilis three times: during the initial visit, at 28 weeks,

Received: 20 May 2025
Accepted: 15 July 2025
Published: 29 August 2025

and during delivery. If the point-of-care test returns reactive, the patient should receive treatment on the same day, with a follow-up appointment scheduled for one week.[5,7,8] The WHO strongly recommends screening all pregnant women for syphilis during their first antenatal care visit, regardless of whether the prevalence of syphilis is high or low.[5] The Centers for Disease Control and Prevention (CDC) recommends that all women undergo serological screening for syphilis during their first prenatal care visit. Screening should also be repeated twice during the third trimester, specifically at 28 weeks of gestation.[9] In line with global guidance, the Indonesian government includes syphilis screening during the first trimester of antenatal care, with repeat testing three months later, before delivery, or if clinical suspicion arises.[6]

Despite the availability of well-established screening protocols and national policies aimed at preventing mother-to-child transmission, gaps remain in the timely implementation of these practices. This case highlights one such gap—where a pregnant woman, though diagnosed with syphilis, did not receive appropriate treatment in time. The delayed intervention resulted in preterm labor and the neonatal death of her infant within hours of birth. This case underscores not only the clinical consequences of missed opportunities in maternal care but also the broader need for reinforcing accountability and follow-up in antenatal syphilis management programs.

Case Illustration

A 24-year-old woman, G3P2A0, 29–30 weeks of pregnancy, was admitted to the hospital due to a significant amount of fluid leakage from the birth canal with labour contractions, which started six hours before admission. She was diagnosed with syphilis by TPHA reactive at primary health care. However, benzathine penicillin was not available at the primary healthcare facility at the time of diagnosis, and the patient was neither referred nor advised to seek treatment at an alternative facility where the medication was accessible. Furthermore, due to limited understanding of the importance and urgency of timely treatment, the patient did not independently pursue further care. The patient's first prenatal visit was at 6 weeks of gestation, but she did not receive a triple elimination screening during that visit.

The day before admission, the patient was treated in the hospital for premature contractions and a urinary tract infection during pregnancy. She had been given ceftriaxone 2x1g IV, Isoxsuprine 3×1 tablet, and dexamethasone 2×6 mg IM for four doses of lung maturation. The patient was referred to the Dermatology Department and was advised to undergo VDRL and TPHA tests before receiving syphilis treatment. Due to limited facilities, the results of these follow-up tests were only available two days later. There were no records of chronic illnesses such as hypertension, diabetes, or asthma.

The patient had a history of two prior full-term vaginal deliveries, each with an estimated birth weight of 3500 grams. The current pregnancy resulted from a third marital relationship. According to the patient, her current spouse had a history of multiple sexual partners and discontinued involvement in the pregnancy during the second trimester. The results of the VDRL and TPHA tests from two days ago have come out, showing a TPHA result of 22810 and a reactive VDRL. During the examination, the patient's vital signs were within normal limits, and uterine contractions occurred 3–4 times every 10 minutes, lasting 40 seconds each, with the fetal heart rate ranging from 140–144 beats per minute. An internal examination showed complete cervical dilation with the fetal head at station +2. The patient was diagnosed with G3P2A0, 29–30 weeks gestation, the second stage of labour, and reactive syphilis (not yet treated). The patient was then managed for vaginal delivery, resulting in the premature birth of a male infant weighing 1015 grams and measuring 33 cm in length. The baby was born in a weakened condition, with APGAR scores of 3 at one minute, 5 at five minutes, and 5 at ten minutes. The baby required resuscitation and was planned for intensive care in the NICU. During resuscitation, the baby's heart rate was recorded at 20 beats per minute, prompting effective positive pressure ventilation (PPV). A bedside echocardiography revealed a large patent ductus arteriosus (PDA), moderate tricuspid regurgitation, moderate mitral regurgitation, and a patent foramen ovale (PFO). The baby received treatment, including intubation, intravenous fluids (0.9% NaCl), and antibiotic therapy with ampicillin and gentamicin. However, two hours after admission, the baby's condition deteriorated, and one hour later, the baby was declared deceased.

During postpartum period physical examination, the mother's condition were within normal limits. After informed consent and further consultation with the Dermatology Department, the patient was also scheduled to receive a single dose of 2.4 million units of intramuscular benzathine penicillin G. By the time of discharge, the patient had received one doses treatment for her syphilis. The disease progression of this case is illustrated in Figure 1. After discharge, the patient did not return for follow-up or receive syphilis treatment at the original facility. Approximately 1.5 months later, she presented to another hospital and was given the first dose of benzathine penicillin. Unfortunately, this was after delivery and the neonatal death had already occurred.

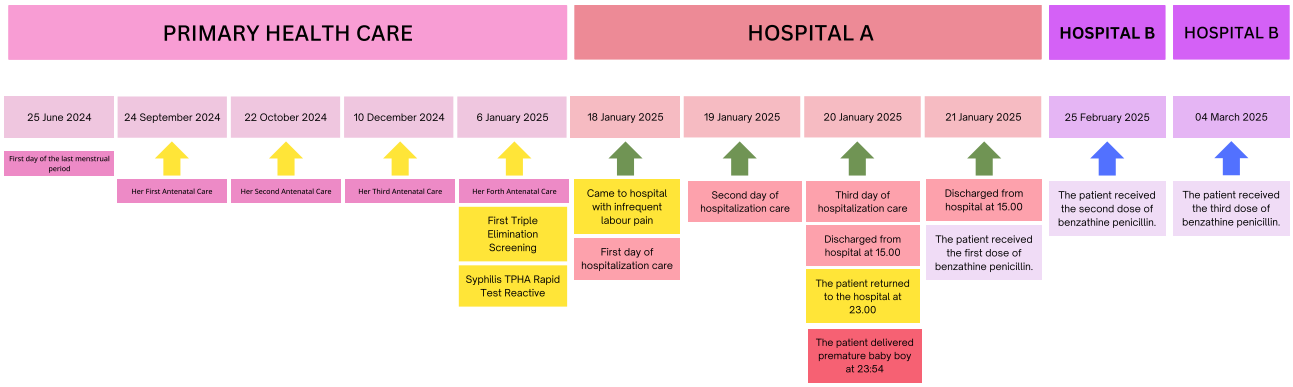

Figure 1 Illustration of this case.

Discussion

Syphilis is a sexually transmitted infection historically known by various names, such as morbus gallicus, mal francese, or neapolitan itch.[10] Syphilis is caused by one of the four species within the Treponema genus, which belongs to the Treponemataceae family.[9] This organism cannot be cultured or stained like other bacteria. T. pallidum has an outer and inner membrane and a thin cell wall composed of peptidoglycan.[10] However, its outer membrane is unique because it lacks lipopolysaccharides (LPS), making it more susceptible to physical disturbances or chemical exposure damage. The diagnosis of this bacteria can only be confirmed through direct observation using a dark-field microscope or serological testing.[10]

A definitive diagnosis of Treponema pallidum infection is challenging because this microorganism cannot be cultured like other bacteria. Therefore, diagnosis can be made using darkfield microscopy, polymerase chain reaction (PCR), or the direct fluorescent antibody test.[9] However, since these methods are not widely available in many healthcare facilities, diagnosis often relies on clinical findings and serological tests. Serological tests for syphilis are categorized into two types: non-treponemal and treponemal tests. Non-treponemal tests, such as the Rapid Plasma Reagin (RPR) or Venereal Disease Research Laboratory (VDRL), detect antibodies against lipid components from damaged T. pallidum cells.[9] However, these tests may also yield positive results in other infections or autoimmune diseases, making them non-specific and prone to false positives.

If a non-treponemal test is positive, confirmation is performed using treponemal tests such as the Treponema Pallidum Hemagglutination Assay (TPHA), Treponema Pallidum Particle Agglutination (TP-PA), Fluorescent Treponemal Antibody Absorption (FTA-ABS), or Treponema Pallidum Rapid Test (TP rapid).[9] Treponemal tests are more specific because they detect antibodies against T. pallidum, although they cannot distinguish between active and treated infections. These tests remain optimistic for a lifetime, even after successful treatment. TP rapid is one of the simpler and faster treponemal tests, which can provide results within 10–15 minutes. Despite its 85–98% sensitivity and specificity of 93–98%, TP rapid cannot be used to monitor treatment effectiveness or differentiate between active and past infections.[9]

A consensus has been reached among several key health organizations, including the American College of Obstetricians and Gynecologists (ACOG), the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and the Ministry of Health of Indonesia. All of these health organizations recommend that syphilis screening be conducted for all pregnant women during their first antenatal care visit.[5,7,8] ACOG even recommends that syphilis serology testing be performed three times: at the first encounter, at 28 weeks, and at delivery. This screening plays a vital role in preventing serious complications in pregnant women with syphilis. Studies showed a decrease in the likelihood of stillbirth, neonatal death, and congenital syphilis in newborns. Moreover, studies indicate that antenatal syphilis screening is both a practical and cost-efficient intervention, regardless of whether syphilis prevalence in a region is high or low. A cohort study involving 1030 mothers in Brazil found that inadequate antenatal care significantly increased the risk of low birth weight and preterm birth.[11]

In this case, the patient only underwent triple elimination screening at 28 weeks of gestation during her fourth antenatal visit. A systematic review reported various barriers to implementing dual rapid HIV and syphilis testing in low-

and middle-income countries. These barriers included social and cultural norms, policy constraints, resource limitations, healthcare provider attitudes, misinformation, and fear of receiving test results.[12] The Figure 2 illustrates the barriers to implementing rapid tests.[12]

There are two types of serological screening for syphilis: the traditional algorithm and the reverse algorithm. In the traditional algorithm, the screening starts with a nontreponemal test (VDRL), followed by VDRL titer testing and a treponemal serological test.[9] This algorithm has been used for decades because nontreponemal tests (which detect lipoidal antigens) are relatively inexpensive, while treponemal tests are more manual, labor-intensive, costly, and limited in number.[9] In the reverse algorithm, screening starts with a treponemal rapid test. The reverse algorithm tends to be more affordable and can identify more patients in need of treatment. However, both algorithms have their advantages and disadvantages, and both are acceptable for use.[9]

According to the Indonesian Ministry of Health Regulation (PMK) No. 52 of 2017, the treponemal rapid test (TPHA) is used as the screening tool for syphilis, following the reverse algorithm. The regulation also states that a reactive result from the treponemal rapid test should immediately be followed by the administration of 2.4 million IU of benzathine penicillin therapy.[6] According to WHO's treatment guidelines, healthcare providers can perform an on-site treponemal test as a single test and provide treatment during the same visit based on the results. In this approach, they first administer the treponemal test on-site to the pregnant woman. If the result is seronegative, they confirm the negative of syphilis infection. However, if the result is positive, they must immediately administer treatment to prevent adverse pregnancy outcomes, as a single dose of benzathine penicillin is considered sufficient to avoid such complications.[7] After the patient was discharged, she did not return for follow-up visits to the hospital, so she did not receive any treatment for syphilis. After 1.5 months, she came to another hospital and received the first dose of benzathine penicillin. During this period, the patient had already given birth with poor neonatal outcomes.

A systematic review and meta-analysis showed that treating pregnant women with active syphilis can reduce the risk of preterm birth by 52%, stillbirth by 79%, and low birth weight by 50%.[13] Congenital syphilis, on the other hand, is transmitted from mother to fetus during pregnancy. In early congenital syphilis, the symptoms will impact the skin, bones, and various organs. In contrast, late congenital syphilis develops when the infection remains beyond the age of two, potentially resulting in developmental impairments and additional organ damage in the child.

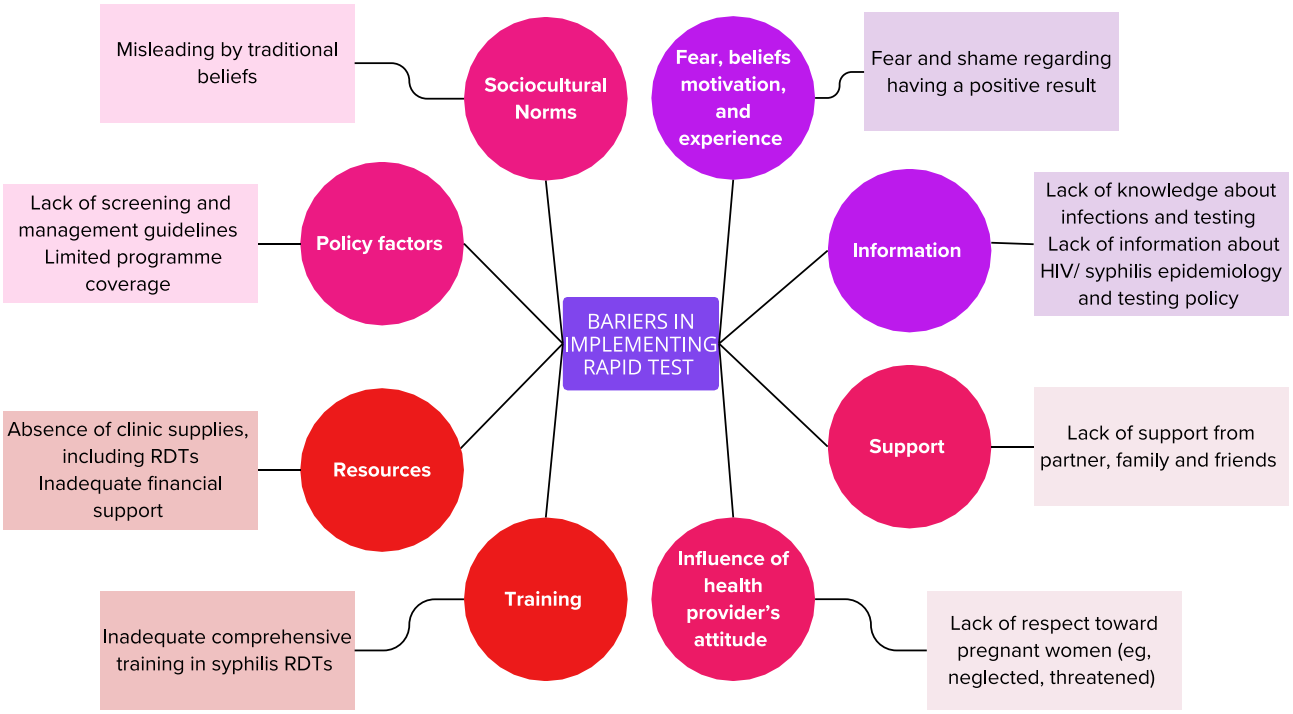

Figure 2 Barriers in Implementing Rapid Test.[12]

In this case, the baby was born prematurely with severe asphyxia, characterized by a low APGAR score and respiratory distress requiring immediate resuscitation. A bedside echocardiography revealed cardiovascular abnormalities, including a large Patent Ductus Arteriosus, moderate Tricuspid Regurgitation, moderate Mitral Regurgitation, and a Patent Foramen Ovale. These anomalies may be related to congenital syphilis complications, which often affect the fetal cardiovascular and central nervous systems. Cardiovascular conditions, such as PDA associated with congenital syphilis, are seldom discussed in the medical literature.[14] Eventually, the newborn was pronounced dead three hours post-delivery.

Since 1943, penicillin has been an effective treatment for syphilis and remains the recommended primary therapy. For pregnant women, the recommended treatment for primary, secondary, or latent syphilis is benzathine benzylpenicillin at a dose of 2.4 million IU, administered via intramuscular injection. For patients with latent syphilis, the recommended treatment is benzathine benzylpenicillin 2.4 million IU, given once per week for three consecutive weeks.[7,15]

If benzathine benzylpenicillin is unavailable at healthcare facilities, an alternative treatment is procaine benzylpenicillin at a dose of 600,000 IU per day for at least 30 consecutive days, with a total of 18 million IU. To date, no alternative treatment has been proven as effective as penicillin for pregnant women.[7,15]

Although erythromycin and azithromycin have the potential to cure syphilis in pregnant women, these antibiotics do not effectively cross the placenta and therefore cannot prevent congenital syphilis in the fetus.[7,16] Tetracyclines, including doxycycline, are considered effective but are not recommended during pregnancy due to their potential adverse effects on the fetus. The only adequate treatment option for pregnant women with a penicillin allergy is desensitization followed by penicillin therapy. However, in certain situations where penicillin is unavailable or desensitization is not feasible, alternative regimens may be considered.[7,15]

This case illustrates the severe consequence of delayed syphilis screening and treatment during pregnancy, emphasizing the critical importance of timely antenatal care. However, we acknowledge that other potential causes of neonatal death, such as intrauterine infections, birth trauma, or metabolic disorders, were not ruled out due to limited resources and the rapid clinical decline. Despite this limitation, the case still underscores the urgent need for reinforcing routine syphilis screening, early intervention, and full neonatal evaluation in suspected congenital infections.

Conclusion

This case illustrates a syphilis infection during pregnancy that did not receive adequate treatment during pregnancy, leading to adverse neonatal outcomes. Triple elimination screening is crucial for all pregnant women during the initial antenatal visit. Furthermore, ensuring follow-up of test results according to regulation is essential to prevent potential complications related to the infection.

Informed Consent Patient Statement

No formal ethical clearance was required for the publication of this case. The authors confirm that written informed consent has been obtained from the involved patient. The patient has been informed about the details of the case and has provided approval for the information to be published in this case report.

Disclosure

The authors report no conflicts of interest in this work.

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