Asian Journal of Health Research
Journal Homepage: https://a-jhr.com
Published by Ikatan Dokter Indonesia Wilayah Jawa Timur

OPEN ACCESS

Case Report

Congenital and Maternal Syphilis: Evaluation and Serology

Epifania Fitriana Adna*, Lita Setyowatie

Department of Dermatology, Venereology and Aesthetics, Faculty of Medicine, Universitas Brawijaya/ Dr. Saiful Anwar Hospital, Malang, East Java, Indonesia

ARTICLE HISTORY
Received: 8 May 2026
Revised: 3 June 2026
Accepted: 4 July 2026

CORRESPONDING AUTHOR*
Epifania Fitriana Adna
evifania@gmail.com
Department of Dermatology, Venereology and Aesthetics, Faculty of Medicine, Universitas Brawijaya/ Dr. Saiful Anwar Hospital, Malang, East Java, Indonesia

KEYWORDS
Secondary Syphilis; Syphilis in Pregnancy; Congenital Syphilis; Benzathine Penicillin G; Procaine Penicillin G

This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (https://creativecommons.org/licenses/by/4.0/)

ABSTRACT

Introduction: Syphilis during pregnancy poses a risk of congenital syphilis. This case report highlights the importance of syphilis screening in pregnant women, appropriate management, and post-treatment serological monitoring.

Case Presentation: We report a case involving a married couple: a 17-year-old pregnant woman at 26–28 weeks of gestation and her 21-year-old husband. Both patients presented with hyperpigmented patches on the body, palms, and soles. Serological testing in the pregnant woman revealed a reactive Venereal Disease Research Laboratory (VDRL) test with a titer of 1:4 and a reactive Treponema pallidum Hemagglutination Assay (TPHA). In her husband, the VDRL test was reactive with a titer of 1:16, and the TPHA was also reactive. The pregnant woman was treated with benzathine penicillin G, 2.4 million IU intramuscularly, administered once weekly for two consecutive weeks, while her husband received a single dose. Serological examination of the newborn revealed a reactive VDRL test with a titer of 1:4. The infant was treated with procaine penicillin G at a dose of 50,000 IU/kg body weight/day for 10 days.

Conclusion: Adequate treatment of syphilis in pregnant women, sexual partners, and newborns is essential to prevent complications and congenital syphilis.

Cite this as: Adna EF, Setyowatie L (2026) Congenital and Maternal Syphilis: Evaluation and Serology. *Asian J Heal Res*. 5 (2): 188–197. doi: https://doi.org/10.55561/ajhr.v5i2.350

INTRODUCTION

Syphilis is a sexually transmitted infection (STI) caused by *Treponema pallidum* (*T. pallidum*) subspecies *pallidum*. It is a chronic systemic disease with diverse clinical manifestations and is therefore widely known as "the great imitator." Transmission primarily occurs through sexual contact, but it may also occur vertically from mother to fetus, resulting in congenital syphilis [1].

Globally, syphilis remains a major public health problem. The World Health Organization (WHO) estimated that there were approximately 8 million new cases of syphilis among individuals aged 15–49 years in 2022, as well as 700,000 cases of congenital syphilis, with an incidence rate of 523 per 100,000 live births. Syphilis infection during pregnancy may lead to miscarriage, fetal death, preterm birth, and congenital syphilis [2,14]. Low rates of early detection and delayed treatment, particularly among high-risk populations and pregnant women, remain major challenges. Benzathine penicillin G is the mainstay of therapy for syphilis and is highly effective in eradicating infection and preventing vertical transmission [2,3].

This case report aims to describe the clinical manifestations, diagnosis, and management of secondary syphilis in a married couple, as well as

suspected congenital syphilis in their infant. It also emphasizes the importance of screening and adequate treatment in preventing mother-to-child transmission.

CASE PRESENTATION

Case 1

A 17-year-old pregnant woman presented to the Dermatology, Venereology, and Aesthetic Clinic of Hospital. She was referred from the Obstetrics and Gynecology Clinic with a diagnosis of G3P2A0 at 26–28 weeks of gestation and suspected syphilis. Serological examination revealed a reactive Venereal Disease Research Laboratory (VDRL) test with a titer of 1:4 and a reactive Treponema pallidum Hemagglutination Assay (TPHA). The patient complained of brownish-black patches on the trunk, upper and lower extremities, palms, and soles, accompanied by mild intermittent pruritus. The lesions initially appeared as erythematous macules on the left hand two weeks before presentation and gradually spread to other body areas before becoming hyperpigmented.

The patient had been diagnosed with syphilis one week earlier at a primary health center based on a reactive rapid plasma reagin (RPR) test with a titer of 1:2. Her obstetric history revealed two previous pregnancies that ended in fetal death three years earlier and neonatal death two years earlier, following premature rupture of membranes. She reported that previous antenatal care had been performed routinely, and initial syphilis screening was reportedly nonreactive. During the current pregnancy, the patient became aware of her pregnancy only at four months of gestation, when serological screening revealed a reactive RPR test. During the fifth to sixth months of gestation, she regularly attended follow-up visits at [Hospital Name].

Antenatal care during the current pregnancy consisted of one visit to a village midwife, two visits to a primary health center, and five visits to an obstetrician. Obstetric ultrasonography revealed no abnormalities. The patient denied other complaints, including dysuria, genital ulcers, significant weight loss, prolonged oral ulcers, fever, upper respiratory tract symptoms, arthralgia, lower abdominal pain, alopecia, vaginal discharge, or blurred vision.

The patient was married and reported that her first sexual intercourse was with her husband, who is described in Case 2, four years earlier. She denied a history of multiple sexual partners. Her last sexual intercourse occurred two weeks before presentation. Her husband had experienced similar patches on the trunk and palms approximately three weeks before the onset of the patient's skin lesions. A history of genital ulcers or genital warts was denied. Since the onset of the skin lesions, the patient had not received any treatment. She had no history of drug allergies. She was a housewife, and her highest educational attainment was elementary school.

General physical examination was within normal limits. Examination of the head and neck revealed no abnormalities, including scalp alopecia, oral mucous patches, conjunctival hyperemia, icteric sclera, lymphadenopathy, or lower extremity edema. Dermatological examination revealed multiple hyperpigmented macules, some of which were erythematous, with well-defined borders and irregular margins on the trunk, extremities, palms, and soles. Venereological examination was within normal limits; however, the patient declined genital documentation (Figure 1). Serological examination showed a reactive VDRL test with a titer of 1:4 and a reactive TPHA. HIV testing was nonreactive. Obstetric ultrasonography showed an anterior corpus placenta with grade II maturity and no major congenital abnormalities. Based on the history, physical examination, and supporting investigations, the patient was diagnosed with secondary syphilis in a G3P2A0 pregnancy at 26–28 weeks of gestation.

The patient received intramuscular benzathine penicillin G, 2.4 million IU, administered in two doses at a one-week interval. Counseling regarding sexually transmitted infections, prevention of transmission, and the possibility of a Jarisch–Herxheimer reaction was provided. Because the patient was pregnant, she was also informed that treatment could be associated with uterine contractions, preterm delivery, and decreased fetal movement. The patient was advised to attend regular follow-up visits and undergo serological monitoring with VDRL and TPHA examinations

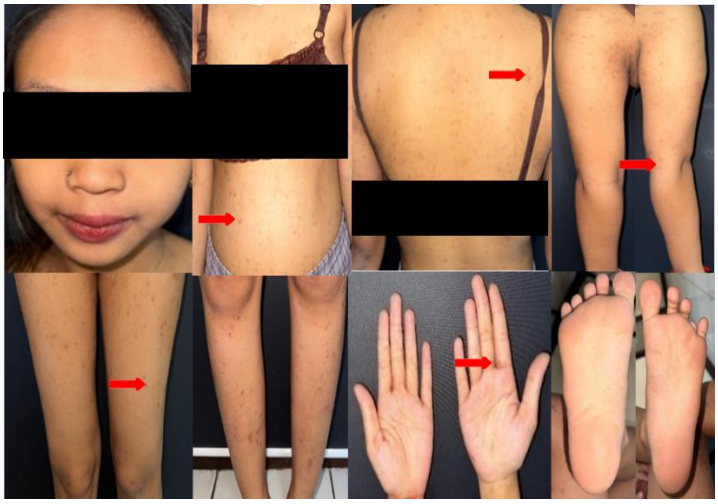


Figure 1. Dermatological findings of the first patient at the initial visit.
Multiple hyperpigmented macules, some of which were erythematous, with well-defined borders, irregular margins, and variable shapes and sizes were observed on the anterior and posterior trunk, bilateral upper and lower extremities, palms, and soles.



Figure 2. Three-Month Follow-Up of Case 1.
The Dermatological and Venereological Findings After Benzathine Penicillin G Injection.

at 1, 3, 6, 9, 12, 18, and 24 months after the final dose of benzathine penicillin G.

One month after the final benzathine penicillin G injection, the patient presented with preterm premature rupture of membranes (PPROM) at 34–36 weeks of gestation and was scheduled for cesarean section. The dermatological lesions persisted, but no new lesions were observed, and there were no symptoms suggestive of reinfection. Serological examination remained reactive, with a VDRL titer of 1:4 and a reactive TPHA. At three and six months after therapy (Figure 2), the hyperpigmented lesions had gradually improved, particularly on both hands, with no new lesions developing. No risk factors for reinfection were identified. However, serological examination remained reactive, with a VDRL titer of 1:4 and a reactive TPHA.

Case 2

A 21-year-old man presented to the Dermatology and Venereology Clinic of [Hospital Name] with complaints of brownish-black patches on the trunk, upper and lower extremities, palms,



Figure 3. Dermatological findings of the second patient at the initial visit.
Multiple hyperpigmented macules, some of which were erythematous, with well-defined borders, irregular margins, and variable shapes and sizes were observed on the anterior and posterior trunk, bilateral upper and lower extremities, palms, and soles.



Figure 4. Three-Month Follow-Up.
The Dermatological and Venereological Findings in the Second Patient After Benzathine Penicillin G Injection.

and soles, accompanied by mild pruritus. The lesions had appeared five months before presentation, initially as small erythematous macules on the trunk that progressively spread and became hyperpigmented within several days. His wife, described in Case 1, had similar skin complaints.

The patient had been diagnosed with syphilis four months earlier at a primary health center based on a reactive rapid plasma reagin (RPR) test with a titer of 1:8. He denied dysuria, lower abdominal pain, genital ulcers, significant weight loss, oral ulcers, fever, upper respiratory tract symptoms, arthralgia, alopecia, and blurred vision. A history of genital ulcers and genital warts was also denied. The patient was married and reported that his first sexual intercourse was with his wife four years earlier. He identified as heterosexual and denied having multiple sexual partners. Sexual activity with his wife included genitogenital and orogenital intercourse without barrier protection, with the last intercourse occurring two weeks before presentation. The patient had not previously received treatment for



Figure 5. Dermatological and Venereological Findings of the Neonate at Birth.
No abnormalities were observed on examination.



Figure 6. Three-Month Follow-Up.
Dermatological and Venereological Findings of the Infant After Procaine Penicillin G Injection.

his skin lesions. One year earlier, he had experienced urethral discharge, which resolved after receiving oral treatment at a primary health center. He worked as a construction laborer and had completed junior high school.

General physical examination was within normal limits. Examination of the head and neck revealed no abnormalities, including scalp alopecia, oral mucous patches, conjunctival hyperemia, icteric sclera, lymphadenopathy, or lower extremity edema. Dermatological examination revealed multiple hyperpigmented macules, some of which were erythematous, with well-defined borders, irregular margins, and variable shapes and sizes on the trunk, extremities, palms, and soles. Venereological examination was within normal limits; however, the patient declined genital documentation (Figure 3). Serological examination showed a reactive Venereal Disease Research Laboratory (VDRL) test with a titer of 1:16 and a reactive Treponema pallidum Hemagglutination Assay (TPHA). HIV testing was nonreactive. Based on the history, physical examination, and supporting investigations, the patient was diagnosed with secondary syphilis.

The patient received a single intramuscular dose of benzathine penicillin G, 2.4 million IU, and was educated regarding the prevention of sexually transmitted infections and the possibility of a Jarisch–Herxheimer reaction. Regular follow-up visits were recommended. At 1 and 3 months after therapy, the hyperpigmented lesions persisted without new lesions developing, although pruritus

had improved (Figure 4). No risk factors for reinfection were identified. Serological examination at one month showed a decrease in the VDRL titer from 1:16 to 1:8, with a reactive TPHA. At three months, the VDRL titer remained reactive at 1:8, with a reactive TPHA.

Case 3

A male neonate was delivered by cesarean section at [Hospital Name] to a mother diagnosed as G3P2A0 at 34–36 weeks of gestation with PPROM, syphilis under treatment, and BOH. The infant cried immediately after birth, had good muscle tone, clear amniotic fluid, and an Apgar score of 8–9. The mother had been diagnosed with syphilis at 6 months of gestation and had received two doses of intramuscular BPG administered one week apart, with treatment completed more than 30 days before delivery.

General physical examination of the neonate was within normal limits. Birth weight was 2,711 grams. Physical examination revealed a normocephalic infant without nasal discharge, conjunctival hyperemia, icteric conjunctiva, lymphadenopathy, or hepatosplenomegaly. Dermatological and venereological examinations were unremarkable, with no erythematous macules or vesicular lesions observed on the skin (Figure 5).

Serological examination performed immediately after birth showed reactive VDRL (1:4) and reactive TPHA. Echocardiography demonstrated normal cardiac structure and function. Babygram radiography suggested bronchopneumonia and gastric dilatation, while femur X-ray evaluation suggested necrotizing enterocolitis (NEC) grade IIa due to progressive gastric dilatation. Based on the maternal history, physical examination, and supporting investigations, the patient was diagnosed with possible congenital syphilis. Cerebrospinal fluid examination and complete blood count were not performed; therefore, based on clinical considerations, the infant was classified as having possible congenital syphilis and received full treatment.

The neonate was admitted to the perinatology ward and treated with intramuscular procaine penicillin G 135,000 units (50,000 units/kg/dose) once daily for 10 days. Ophthalmology and otorhinolaryngology consultations were performed as part of congenital syphilis screening, and both evaluations were normal. The parents were counseled regarding congenital syphilis transmission during pregnancy and were advised to attend regular follow-up visits with the pediatric department. Repeat VDRL and TPHA testing was scheduled three months after completion of treatment.

At the 3-month follow-up after completing procaine penicillin G therapy, the infant remained asymptomatic, with no history of skin lesions, vesicles, fever, or nasal discharge. General physical, dermatological, and venereological examinations remained within normal limits (Figure 6). Follow-up serological testing demonstrated a nonreactive VDRL result (previously 1:4), while TPHA remained reactive.

To clarify the clinical course in accordance with the CARE guidelines for case reports, the case timeline is summarized in a table, including maternal diagnosis, treatment, delivery, neonatal evaluation, neonatal treatment, and serological follow-up.

DISCUSSION

Syphilis is a sexually transmitted infection (STI) caused by the spirochete *Treponema pallidum* subspecies *pallidum* (*T. pallidum*). Due to its diverse clinical manifestations, syphilis is widely known as "the great imitator" [1,4]. Despite advances in prevention and treatment, syphilis remains a major global public health problem. The World Health Organization (WHO) estimated that the number of new syphilis cases among adults aged 15–49 years increased from 7.1 million cases in 2020 to 8.0 million cases in 2022 [2,5].

Congenital syphilis was estimated to account for 700,000 cases worldwide in 2022, with an incidence of 523 cases per 100,000 live births, which remains far above the WHO elimination target for vertical transmission [2,14,15]. Maternal syphilis is associated with adverse pregnancy outcomes, including miscarriage, stillbirth, prematurity, low birth weight, neonatal death, and congenital syphilis [2,13,15].

In this report, the first patient was a 17-year-old pregnant woman, and the second patient was her 21-year-old husband, both of whom were within the sexually active age group. The first patient had received adequate benzathine penicillin G (BPG) treatment during pregnancy, which reduced the risk of vertical transmission; however, preterm delivery still occurred at 34–36 weeks of gestation. *T. pallidum* is a highly motile, spiral-shaped spirochete, and humans are its only natural host. The organism replicates slowly, with a doubling time of approximately 30–50 hours, which explains the effectiveness of long-acting penicillin therapy [6].

Syphilis is classified as acquired or congenital syphilis. Acquired syphilis is mainly transmitted through sexual contact, while congenital syphilis occurs through vertical transmission from mother to fetus [4,6]. Early syphilis includes the primary, secondary, and early latent stages occurring within one year of infection [4,11]. Secondary syphilis usually develops 3–12 weeks after an untreated primary infection and is characterized by diffuse mucocutaneous manifestations, commonly reddish-brown maculopapular eruptions involving the trunk, extremities, palms, and soles [1,4,6]. Lesions are generally nonpruritic, although pruritus may occur in some patients [6].

Both adult patients in this report presented with symmetrical hyperpigmented macules on the trunk, palms, and soles, consistent with secondary syphilis. The lesions initially appeared erythematous before becoming hyperpigmented. Mild pruritus was reported by the first patient. No facial involvement, mucous patches, condyloma lata, or alopecia were identified. Serological examination in both patients showed reactive VDRL and TPHA results, supporting the diagnosis of secondary syphilis.

Clinical manifestations of syphilis during pregnancy are generally similar to those in nonpregnant women [3]. Vertical transmission may occur transplacentally during any trimester or during delivery through direct contact with infectious lesions. The highest transmission risk occurs in untreated primary or secondary syphilis, reaching 60–100%, whereas lower rates are observed in latent syphilis [7,10]. In this case, the first patient was diagnosed and treated during the second trimester, which likely reduced the risk of fetal infection. Obstetric ultrasonography showed no major fetal abnormalities.

Effective prevention of congenital syphilis relies on early maternal diagnosis through routine serological screening during pregnancy [3,8]. Delayed screening in the first patient occurred because the pregnancy was recognized only at four months of gestation. Congenital syphilis may present as early or late disease. Early congenital syphilis usually manifests within the first two years of life, most commonly during the first three months [4,7]. Approximately two-thirds of affected neonates are asymptomatic at birth [6]. Common manifestations include copper-colored maculopapular eruptions, snuffles, condyloma lata, hepatosplenomegaly, anemia, and skeletal abnormalities [4,6].

The third patient in this report was diagnosed with possible congenital syphilis based on maternal history and reactive neonatal serology. The infant was asymptomatic at birth, with no dermatological abnormalities, hepatosplenomegaly, or systemic manifestations, consistent with the literature describing asymptomatic presentation in most early congenital syphilis cases [4,6,9]. Neonatal serological examination showed reactive VDRL (1:4) and reactive TPHA. However, interpretation of neonatal serology is challenging because maternal IgG antibodies may cross the placenta. Therefore, diagnosis and treatment decisions should consider maternal infection status, adequacy of maternal treatment, neonatal clinical findings, and comparison of maternal and neonatal nontreponemal titers [3,8].

Serological tests for syphilis consist of nontreponemal and treponemal tests. Nontreponemal tests, including VDRL and RPR, detect antibodies against lipoidal antigens released from damaged host cells and *T. pallidum*, and are useful for both diagnosis and treatment monitoring. Treponemal tests detect antibodies specific to *T. pallidum* [6]. Diagnosis of syphilis can be established through clinical manifestations, direct identification of the organism, or reactive serological tests [1].

Benzathine Penicillin G remains the treatment of choice for maternal and acquired syphilis because treponemicidal serum concentrations persist for up to 21–28 days [3]. According to CDC

Table 1. Serological Monitoring of Three Patients Following Benzathine Penicillin G Treatment

Patient	Serological Test	Month 0	Month 1	Month 3	Month 6
Patient 1	VDRL	Reactive (1:4)	Reactive (1:4)	Reactive (1:4)	Reactive (1:4)
	TPHA	Reactive	Reactive	Reactive	Reactive
Patient 2	VDRL	Reactive (1:16)	Reactive (1:8)	Reactive (1:8)	-
	TPHA	Reactive	Reactive	Reactive	-
Patient 3	VDRL	Reactive (1:4)	Reactive (1:4)	Non-reactive	-
	TPHA	Reactive	Reactive	Reactive	-

guidelines, a single intramuscular dose of BPG 2.4 million IU is recommended for early syphilis, while pregnant women with early syphilis may benefit from an additional dose one week later to reduce congenital transmission risk [8]. In this report, the first patient received two doses of intramuscular BPG 2.4 million IU at a one-week interval, while the second patient received a single dose for secondary syphilis. The third patient was treated with intramuscular Procaine Penicillin G 50,000 IU/kg/day for 10 days, consistent with CDC recommendations for possible congenital syphilis [4,7,8].

Patients were also educated regarding the possibility of Jarisch–Herxheimer reaction following penicillin therapy. This reaction occurs due to rapid destruction of treponemes and usually develops within 4–6 hours after treatment [3]. Pregnant women treated during the second half of pregnancy should be monitored for uterine contractions, fetal distress, or preterm labor.[7]Management of sexual partners is essential because up to 60% of sexual partners of patients with syphilis may also be infected [1]. In this report, both adult patients were married and had recent unprotected sexual contact; therefore, treatment of both partners was necessary to prevent reinfection and disease progression.

Treatment response should be evaluated clinically and serologically using VDRL or RPR titers at regular follow-up intervals. Successful therapy is generally defined as at least a fourfold decline in nontreponemal titers within 6–12 months for early syphilis [4]. In the first patient, VDRL remained reactive at 1:4 for six months after therapy, and continued monitoring was planned. In the second patient, VDRL titers decreased from 1:16 to 1:8 within three months, indicating a favorable serological response. In the third patient, follow-up serology three months after Procaine Penicillin G therapy showed nonreactive VDRL, indicating a good therapeutic response (Table 1).

Thus, treatment success in this case should not be determined solely based on clinical improvement but should also be supported by serial serological monitoring using quantitative VDRL testing. If the VDRL titer decreases at least fourfold compared with the baseline titer within an appropriate follow-up period, this indicates an adequate therapeutic response. However, if the titer remains stable without a significant decrease, increases again, or is accompanied by new clinical symptoms, the possibilities of a serofast state, reinfection, treatment failure, suboptimal treatment adherence, or central nervous system involvement should be considered according to the patient's clinical context.

CONCLUSION

Syphilis infection can be vertically transmitted from mother to fetus, resulting in congenital syphilis. In this case report, the first and second patients, a married couple, were diagnosed with secondary syphilis. Following Benzathine Penicillin G therapy, the first patient remained under serological monitoring up to 12 months to evaluate treatment response, while the second patient showed a favorable serological response. The third patient, diagnosed with possible congenital syphilis, was successfully treated with Procaine Penicillin G. This case report emphasizes the importance of routine syphilis screening during pregnancy, appropriate management, and treatment of sexual partners to prevent transmission and further complications.

ACKNOWLEDGMENT

The authors express their sincere gratitude to the patient and her family for their cooperation and for providing consent to publish their medical information. Their permission and support were indispensable to the completion of this case report and to the advancement of medical knowledge.

CONFLICT OF INTEREST

In the interest of transparency, the authors confirm that they have no conflicts of interest pertaining to the publication of this work.

REFERENCES

1. Purnamasari I, Barakbah J, Martodihardjo S, Murtiastutik D, Sari M, Widyantari S, et al. Secondary Syphilis During Pregnancy: The Importance of Screening and Clinical Management. 2021.p.145-8. DOI: https://doi.org/10.20473/bikk.V33.2.2021.145-149
2. World Health Organization. WHO guideline on syphilis screening and treatment for pregnant women. Geneva: World Health Organization; 2017
3. Penerbit S, Kelima E, Fahrni S, Hanny D, Wresti N, Makes Farida B, et al. Infeksi Menular Seksual. Edisi ke 5. Fakultas Kedokteran Indonesia.2017.h. 103
4. Panduan Praktik Klinis. Perhimpunan Dokter Spesialis Kulit dan Kelamin Indonesia. 2024.p.736-43.
5. European Centre for Disease Prevention and Control. Annual epidemiological report for 2023 – syphilis. 2023.p.1-2.
6. Tuddenham SA, Zenilman JM. Syphilis. In: Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, Wolff K, editors. Fitzpatrick's Dermatology in General Medicine. 9th edition. New York : Mc Graw Hill. 2019. p. 3145-68.
7. Sankaran D, Partridge E, Lakshminrusimha S. Congenital Syphilis-An Illustrative Review. Children (Basel). 2023;10(8):1310. Published 2023 Jul 29. DOI: 10.3390/children10081310
8. Workowski KA, Bachmann LH, Chan PA, Johnston CM, Muzny CA, Park I, et al. Sexually transmitted infections treatment guidelines, 2021. MMWR Recomm Rep. 2021;70(4):1–187. doi:10.15585/mmwr.rr7004a1.
9. Shafi T, Radolf D, et all. Congenital Syphilis. In: Nelson RA editors. Sexually Transmitted Disease. 4th edtition. New York: Mc Graw Hill. 2008. p.1577
10. Fang J, Partridge E, Bautista GM, Sankaran D. Congenital Syphilis Epidemiology, Prevention, and Management in the United States: A 2022 Update. Cureus. 2022;14(12):e33009. Published 2022 Dec 27. DOI: 10.7759/cureus.33009
11. Djuanda A. Menaldi SL, Bramono K, Indriatmi W. Editors. Ilmu Penyakit Kulit dan Kelamin. 2019.p.455-464.
12. Kementerian Kesehatan Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan IR. Pedoman Nasional Penanganan Infeksi Menular Seksual. 2015.p.12-21.
13. Irawan Y, Chelsea E, Surya R. Syphilis Elimination in Indonesia by 2030: Keeping in the Right Track. Vol. 50
14. World Health Organization (WHO). Global Health. Observatory. http://apps.who.int/gho/data/node. main. Accessed November 18, 2022
15. Walensky RP, Jernigan DB, Bunnell R, Layden J, Kent CK, Gottardy AJ, et al. Morbidity and Mortality Weekly Report Sexually Transmitted Infections Treatment Guidelines, 2021 Centers for Disease Control and Prevention MMWR Editorial and Production Staff (Serials) MMWR Editorial Board. 2021. DOI: 10.15585/mmwr.rr7004a1
16. Yu W, You X, Luo W. Global, regional, and national burden of syphilis, 1990–2021 and predictions by Bayesian age-period-cohort analysis: a systematic analysis for the global burden of disease study 2021. Front Med (Lausanne). 2024. DOI: 10.3389/fmed.2024.1448841
17. Santis M, Luca C, Mappa I, Spagnuolo T, Licameli A, Straface G. Syphilis infection

during pregnancy: fetal risks and clinical management. Hindawi Publishing Corporation Infectious Diseases in Obstetrics and Gynecology. 2012. p. 1-6. DOI: 10.1155/2012/430585

18. Aziz MA, Wantania J, Aryasatiani E, Bernolian N, dkk. Editors. Manajemen Triple Eliminasi Hepatitis B, HIV dan Sifilis. Kelompok Kerja Infeksi Saluran Reproduksi Pengurus Pusat POGI. 2019.p.11.
19. Kielaite D, Januskiene S, Paliulyte V. Syphilis infection during pregnancy: the possible effect on the course of pregnancy and fetal outcomes—a case report and literature review. Biomedicines. 2025;13(1):169. doi:10.3390/biomedicines13010169.
20. Desjardins AA, Amaral E, Miranda J, Pasupathy D, Martins ML, Buga E, et al. Syphilis in pregnancy: a practical guide for prenatal care providers. Int J Gynaecol Obstet. 2025;171(2):601–610. doi:10.1002/ijgo.70511.