RESEARCH PAPER

Maternal Leptospirosis and Adverse Fetal Outcomes: Evidence of Placental and Vertical Transmission – Case Series

Prathyusha Bandila[1*], Herosha[2], A. Kala[3]

[1]Postgraduate, Department of OBGY, Meenakshi Medical College Hospital & Research Institute, Kanchipuram. Email: prathyushabandila289@gmail.com (Corresponding Author)

[2]Senior Resident, Department of OBGY, Meenakshi Medical College Hospital & Research Institute, Kanchipuram

[3]Professor, Department of OBGY, Meenakshi Medical College Hospital & Research Institute, Kanchipuram

ABSTRACT

Leptospirosis is a zoonotic infection seen commonly in tropical regions and is often misdiagnosed during pregnancy as it is clinically and laboratory similar to conditions like HELLP syndrome, acute fatty liver of pregnancy, and severe preeclampsia. Symptoms including fever, jaundice, hepatic dysfunction, myalgia, thrombocytopenia, and renal impairment contribute to diagnostic confusion. Maternal leptospirosis is associated with adverse pregnancy prognosis, especially when the infection occurs during the first trimester. Fetal compromise occurs even in mild maternal illness. We report two pregnant women diagnosed with leptospirosis, both complicated by placental dysfunction and fetal involvement, emphasising the importance of early recognition, prompt treatment, and appropriate counselling.

Keywords: Pregnancy, Leptospirosis, Placental dysfunction, Fetal outcome, Vertical transmission

How to cite this article: Bandila P, Herosha, Kala A. Maternal Leptospirosis and Adverse Fetal Outcomes: Evidence of Placental and Vertical Transmission – Case Series. Int J Drug Deliv Technol. 2026;16(22s): 408-410. DOI: 10.25258/ijddt.16.22s.47

Source of support: Nil.

Conflict of interest: None

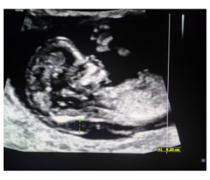
INTRODUCTION

Leptospirosis is an frequently under-diagnosed zoonotic infection caused by spirochetes of the genus Leptospira[3]. There is an increased incidence during monsoon seasons due to exposure to contaminated water and soil[4]. Humans acquire infection via contact with urine of rodents. Due to delay in diagnosis and lack of strong clinical suspicion, there is increased risk of neonatal , maternal morbidity and mortality. We report a case series of two pregnant women diagnosed with leptospirosis , with placental involvement and adverse fetal out come[5].

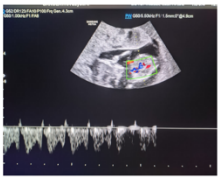
CASE 1

A 22-year-old Gravida two Para one living one, belonging to low socio-economic status, presented at 11 weeks and 5 days of gestation with complaints of dull , lower abdominal pain for 15 days , fever for 10 days, nausea for 5 days, and dry cough for 4 days.

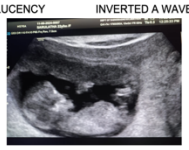
She had been admitted for one week at a peripheral government hospital in view of fever, where Widal test was positive, and was treated with intravenous Ceftriaxone for five days. She was discharged on being asymptomatic but continued to have intermittent fever spikes. Her obstetric history revealed a previous full-term normal vaginal delivery , current pregnancy was spontaneously conceived. On examination, the patient was ill-built with a BMI of 14.4 kg/m²(Severe undernutrition). There was no pallor, icterus, edema, or lymphadenopathy.On per abdominal examination , tenderness noted in the hypogastric and bilateral iliac regions. On Per vaginal examination uterus was corresponding to 10 weeks' size with cervical os closed.



INCREASED NUCAL TRANSLUCENCY



INVERTED A WAVE REVERSAL IN DUCTUS VENOSUS



INHOMOGENOUS ANTERIOR PLACENTA WITH MILDLY EDEMATOUS FETUS

Routine laboratory investigations were done as part of fever evaluation. Serological testing showed elevated Leptospira IgM antibodies (13.63 Panbio units), diagnosing acute infection. C-reactive protein was elevated (72.5 mg/dL).

First-trimester ultrasound showed -Increased nuchal translucency, Reversal of A-wave in ductus venosus, Inhomogeneous anterior placenta and a Mildly oedematous fetus. These findings predicts poor fetal prognosis.

As the first-trimester ultrasound findings were indicating towards poor fetal prognosis, patient was counselled about the risks of continuation of pregnancy , advised medical termination. However, patient declined termination and wanted to continue the pregnancy. She was lost to follow-up, and the final fetal outcome could not be noted.

FIGURE 3 -Inhomogeneous anterior placenta with middle oedematous fetus

CASE 2

A 26-year-old primigravida at 28 weeks and 3 days of gestation presented with high-grade fever, severe myalgia, and decreased fetal movements for 5 days. She had a history of recent exposure to stagnant water. Further examination revealed ,fever and mild icterus. Laboratory reports showed thrombocytopenia (68,000/mm³) with elevated liver enzymes, hyperbilirubinemia , and raised serum creatinine. Serology for dengue, malaria, and viral hepatitis was negative, on the other hand, Leptospira IgM ELISA was positive.

Ultrasound showed severe oligohydramnios, placental thickening, fetal growth restriction, and absent end-diastolic flow in the umbilical artery doppler. She was treated with intravenous Ceftriaxone for 5 days. Although, maternal improvement was noted, fetal wellbeing was detoriated, indicating emergency cesarean section at 29 weeks.A preterm male neonate (1.1 kg) was delivered who required ventilatory support. Neonatal leptospira IgM was positive, thus confirming vertical transmission. The neonate developed sepsis and multi-organ dysfunction and died on day 4 of life.

DISCUSSION

Leptospirosis is one of the major under-diagnosed zoonotic infection during pregnancy[1]. Its clinical picture mimics other febrile illnesses, leading to delayed diagnosis[6]. During pregnancy, this delay can lead to serious maternal and fetal outcomes. In first case , initial diagnosis of enteric fever based on a positive Widal test resulted in missed early detection of leptospirosis, highlighting the limitations of nonspecific serological testing in endemic areas.

The pathophysiology of placental involvement is due to hematogenous spread of Leptospira at the leptospiremic phase[3]. These spirochetes penetrate the maternal bloodstream and localize in the intervillous space, thus causing endothelial injury, inflammatory cell infiltration, and placental vasculitis[7]. This leads to disruption in the placental barrier, impaired uteroplacental circulation, and occurance focal ischemia and infarction. Placental inflammation causes deprivation in nutrient and oxygen exchange, leading to fetal growth restriction.Infection during early gestation is noted to be associated with spontaneous abortion, fetal demise, and high risk of congenital infection. In contrast, late gestational infection may result in fetal growth restriction, oligohydramnios, preterm birth, or neonatal leptospirosis, even when maternal symptoms are mild.The presence of Leptospira-specific IgM antibodies in neonates, as observed in our second case, supports in utero infection, since IgM does not cross the placenta[2]. This gestational age–dependent variation in fetal outcome highlights the importance of early recognition and close fetal monitoring.

Early diagnosis and prompt initiation of pregnancy-safe antibiotics are essential to reduce maternal and neonatal morbidity and mortality. Ceftriaxone is an effective and safe option in pregnancy and resulted in rapid clinical improvement in the above two cases. Although, fetal outcomes may remain poor while infection occurs at early organogenesis, despite maternal recovery.

In a retrospective study conducted by Shaked et.al,it was noted that they are more likely to spontaneously abort if the infection occurs during the early months of pregnancy[8].Hence, early pregnancy is more susceptible to the disease and the fetal outcome is unfavourable.This case series emphasises the need for a strong clinical suspicion for leptospirosis in pregnant women presenting with prolonged fever in endemic areas to make timely diagnosis, treatment, and informed counselling about the fetal prognosis.

CONCLUSION

Leptospirosis during pregnancy presents with nonspecific clinical symptoms and findings that

often lead to delayed diagnosis. Early gestational infection shows high risk of adverse fetal outcomes due to placental vasculitis and ischemia. Abnormal first-trimester ultrasound markers indicates early fetal compromise secondary to infection. Prompt serological testing and early start of pregnancy-safe antibiotics are key to improve maternal and neonatal outcomes. Although, fetal prognosis remains guarded when infection occurs during organogenesis.Increased awareness among obstetricians in endemic regions will promote timely diagnosis and management[4].

REFERENCES

1. Selvarajah S, Ran S, Roberts NW, Nair M. Leptospirosis in pregnancy: a systematic review. PLoS Negl Trop Dis. 2021;15(9):e0009747.
2. Sengupta M, Latha T, Mandal S, Mukhopadhyay K. Foetal outcome of Leptospira and rickettsial infections during pregnancy: a systematic review. Trans R Soc Trop Med Hyg. 2024;118(12):814–828.
3. Dwivedi JS, Shah DR, Desai GS, Mali KA, Mayadeo NM. Maternal and foetal outcomes of leptospirosis in pregnancy: an observational descriptive study at a tertiary care centre in Western India. J Obstet Gynaecol India. 2025;75(3):213–219.
4. Singh S, Acharya N, Karnik M, et al. Leptospirosis-associated acute respiratory distress syndrome in pregnancy: a rare presentation. Cureus. 2024;16(6):e61809.
5. Guleria S, Dev K, Pathania K. Leptospirosis in pregnancy: a case report. Int J Reprod Contracept Obstet Gynecol. 2022;11(12):3418–3420.
6. Rajandran P, Papa D. Diagnostic difficulties of leptospirosis during pregnancy: a maternal near miss. Int J Reprod Contracept Obstet Gynecol. 2023;12(3):e1–e4.
7. Tong C, Mathur M. Leptospirosis in pregnancy: a rare condition mimicking HELLP syndrome. J Med Cases. 2018;9(10):320–323.
8. McGready R, Ashley EA, Wuthiekanun V, et al. Management of leptospirosis in pregnancy with azithromycin and ceftriaxone. Clin Infect Dis. 2014;58(6):e88–e96.
9. Bharti AR, Nally JE, Ricaldi JN, et al. Leptospirosis: a zoonotic disease of global importance. Lancet Infect Dis. 2003;3(12):757–771.
10. World Health Organization. Human leptospirosis: guidance for diagnosis, surveillance and control. Geneva: WHO; 2003.
11. Karpagam KB, Ganesh B. Leptospirosis: a neglected tropical zoonotic infection of public health importance—an updated review. Eur J Clin Microbiol Infect Dis. 2020;39(5):835–846.
12. Shrestha M, Choudhury SS, Carolin SV, et al. Leptospirosis in pregnancy: prevalence, risk factors, clinical characteristics, and outcomes in a North Indian population. medRxiv. 2022. doi:10.1101/2022.