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Case Report

Diagnostic difficulties of leptospirosis during pregnancy: a maternal near miss

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ABSTRACT

A 24-year-old G2A1 at 34 weeks of gestation was admitted with complaints of nausea, vomiting, pedal edema and high blood pressure recordings. She developed imminent symptoms after admission for which she received prophylactic magnesium sulphate therapy and a provisional diagnosis of severe preeclampsia with imminent symptoms was made. With worsening hematological, liver and renal parameters as she did not fulfill the Swansea's criteria for acute fatty liver of pregnancy (AFLP), partial hemolysis elevated liver enzymes and low platelet count (HELLP) was suspected. She was delivered by cesarean section. Infectious disease work up was sent in view of rising counts and elevated liver enzymes which was positive for leptospirosis. There was also history of walking in the rice fields bare foot and rat infestations in the fields supporting the diagnosis. Both the mother and baby were discharged in a healthy condition. The diagnosis becomes challenging in pregnancy as it mimics pregnancy induced hypertension, acute fatty liver of pregnancy, partial HELLP, obstetric cholestasis and viral hepatitis.

Keywords: Leptospirosis, HELLP syndrome, Pregnancy

INTRODUCTION

Leptospirosis is a zoonotic disease caused by spirochete bacteria in the genus leptospira. In pregnancy the disease poses a major dilemma in diagnosis and management as it mimics diseases such as pregnancy induced hypertension, acute fatty liver of pregnancy, HELLP syndrome, Cholestasis of pregnancy and viral hepatitis. Therefore, diagnosis tends to be missed leading to delay in treatment and adverse outcomes.

CASE REPORT

A 24-year-old G2A1 at 34 weeks of gestation was referred to our hospital with a diagnosis of gestational hypertension and history of nausea and vomiting on and off for the past one week. She had generalized swelling of both lower limbs, hands and face. Her blood pressure was 144/99 mm Hg on admission, and it was 140/90 mm Hg after 15 minutes. She had mild pallor, muddy conjunctiva, bilateral and pedal edema. Her knee jerks were normal and urine protein was 4+. Ophthalmic examination showed normal fundus. Per abdomen showed fundal height corresponding to 30 weeks, foetus was in cephalic presentation with good foetal heart rate and liquor felt average. She was continued on anti-hypertensives and prophylactic magnesium sulphate therapy was started as she developed imminent symptoms the following day. Investigations at admission showed elevated creatinine, bilirubin and liver enzymes and hence the diagnosis of severe preeclampsia was made and induction of labour was undertaken. Haematological investigations showed peripheral smear picture suggestive of normocytic normochromic RBCs with no evidence of hemolysis but platelets were in the falling trend. Renal function, bilirubin and liver enzymes were of increasing trend. Lactate dehydrogenase (LDH) was 700 IU/l and coagulation parameters showed elevated d-dimer and low fibrinogen levels whereas prothrombin, thrombin and activated partial thromboplastin time (aPTT) were normal. Serological tests for viral hepatitis A, B, C, D, E, Urine

bile salts and bile pigments were negative. Serum uric acid levels, amylase and lipase levels were elevated.

Course

She underwent caesarean section for failed induction and an alive preterm male baby weighing 1.2 kg was born who was shifted to neonatal intensive care unit in view of prematurity, low birth weight and meconium-stained liquor. Post-operatively she had chills, low grade fever, myalgia, abdominal pain, conjunctival suffusion and ecchymosis around the abdomen (Figure 1). As total leucocyte counts, liver enzymes and serum bilirubin were in the increasing trend infectious work-up was done. Leptospira IgM was reported to be positive. History regarding her life-style revealed walking barefoot in rice fields with rat infestations, A repeat test for Leptospirosis was positive and a final diagnosis of leptospirosis was made after consultation with physicians. She was given injection azithromycin 500 mg iv 12 hours for 14 days. Her renal parameters, liver enzymes improved and she was discharged on postoperative day 22. Investigations throughout the course of hospital stay are shown in Table 1.

Table 1: Investigations during the course of hospital stay.

Investigation	Date	11-8-21	12-8-21	14-8-21	15-8-21	18-8-21
Complete hemogram	Hb (g/dl)	13	13.6	11.4	8.3	8.1
	Total count (cells/µl)	30220	31070	31730	37720	19120
	Differential count	N85; L10	N84; L10	N83; L18	N76; L16	N66; L18
	Platelet count (lakh/l)	2.10	2.05	1.69	1.64	2.2
Renal function tests	Urea/creatinine (mg/dl)	38/1.27	50/1.49	60/1.46	80/1.46	46/0.7
	Na+/K+ (mEq/l)	127/5.3	128/4.3	127/4.9	128/5.1	131/4.6
Liver function tests	Total bilirubin (mg/dl)	3.8	3.2	3.1	2.7	1.8
	Direct bilirubin(mg/dl)	2.3	1.9	1.7	0.7	2.7
	AST/ALT (IU/l)	167/259	145/244	99/203	135/162	45/45
	Total protein/ albumin (mg/dl)	5.1/2.4	5.1/2.3	5/2.2	5.8/3	5.7/2.7
Coagulation parameters	Bleeding time	1 min 30 s	aPTT	26 s	aPTT=Activated partial thromboplastin time	
	Clotting time	2 min 30 s				
	Prothrombin time	13.8 s	Fibrinogen	169 mg/dl		
	International normalized ratio (INR)	1.17	d-dimer	0.73		
Microbiological tests for sepsis	Blood culture	Sterile	Leptospira 22.8.21	Positive for Igm antibodies		
	Urine culture	Sterile				
Febrile illness panel 19.8.21	Serum Widal-negative					
	Dengue-NS1 antigen-negative					
	Malarial parasite-negative					
	Leptospira antibodies-IgM-positive					

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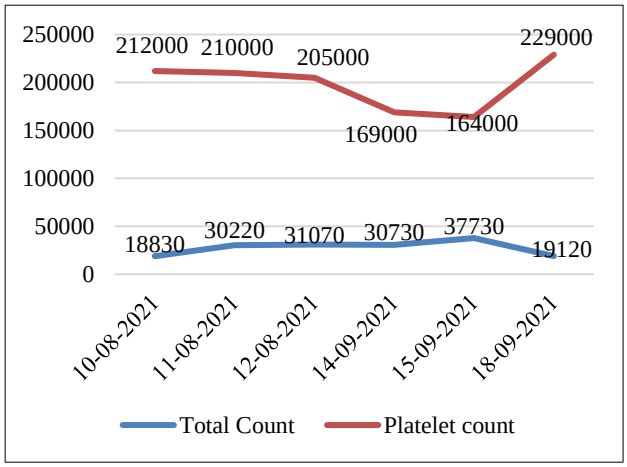

Figure 1: Trend of total count and platelet count during the hospital stay.

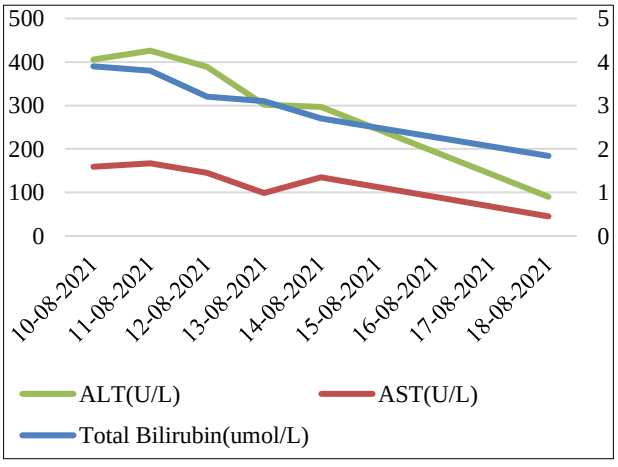

Figure 2: Trend of liver enzymes during hospital stay.

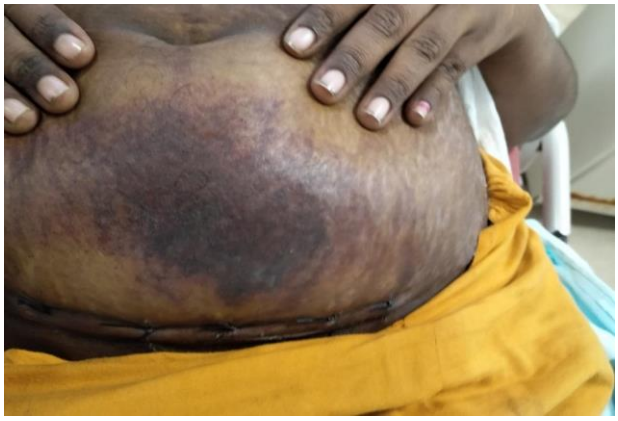

Figure 3: Ecchymotic patch on the abdomen.

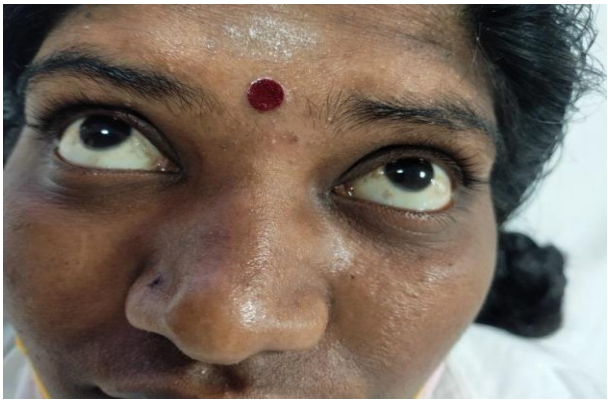

Figure 4: Conjunctival suffusion.

DISCUSSION

Leptospirosis is the most widespread zoonotic disease causing 60,000 deaths annually.[1,2] Majority of cases are reported during the monsoon months.[3] Our case was also reported during the monsoon period. The pathogen is spread by the urine of infected animals such as rodents, dogs, livestock and pigs.[4] Occupations involving direct contact with animals poses a major risk as the infected fluids enter through skin abrasions, mucous membranes and eyes.[5] Our case had a risk factor of exposure to paddy fields rat infestations by walking barefoot.[6] Clinical features vary and are highly non-specific leading to under diagnosis and under-reporting of cases.

Approximately 90% cases have mild symptoms such as fever, headache, chills, myalgia, abdominal pain, diarrhoea, anorexia and vomiting.[7] Nausea, vomiting and headache is present in 75-100%.[8] The severe form of leptospirosis is known as Weil's disease which manifest as pregnancy related hepatorenal diseases by infiltration of space of Disse in the liver leading to disruption of bile canaliculi causing leakage of bile and jaundice, increase in transaminases and proteinuria due to tubulointerstitial inflammation and tubular necrosis.[8,9] Elevated bilirubin out of proportion to rise of transaminases is seen at times due hepatocellular injury. Endothelial injury and capillary leakage predisposes to coagulopathy, haemorrhage in various organs and leads to shock.[7] Our case had renal impairment such as proteinuria, elevated creatinine, elevated bilirubin and transaminases, leukocytosis, thrombocytopenia, derangement in coagulation parameters, elevated d-dimer and fibrinogen which were initially thought to be due to severe pre-eclampsia. She also had characteristic conjunctival suffusion [5] which is seen in leptospirosis.

There was similar presentation of leptospirosis mimicking as AFLP and partial HELLP syndrome in the third trimester of pregnancy in literature.[8,9] This case is unique as she had hypertension requiring antihypertensives throughout the hospital course which were not seen in other cases. Mis-diagnosis occurred as pre-eclampsia in this case initially but the clinical and laboratory features after termination of pregnancy led to ultimate diagnosis of leptospirosis and hence this was a maternal near-miss. Fetal effects such as increased incidence of meconium-stained liquor pathological CTG abortions, stillbirth and low birth weight babies have been reported.[4,5]

Our case also had intrapartum meconium-stained liquor and was shifted to NICU in view of prematurity and low birth weight.

CONCLUSION

Leptospirosis during pregnancy may mimic pre-eclampsia. In the initial phase the symptoms of myalgia and chills may be absent and the haematological parameters mimic those of pre-eclampsia but do not reverse even after the termination of pregnancy. Conjunctival suffusion and echymosis may appear late in the course of the disease.

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