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Case Report

Jaundice in pregnancy and its causes: A case report

Monica George[1,*], **Purvi Parikh**[2], **Akanksha Chandekar**[1], **Prachi Meghani**[2]

[1]*Smt. NHL Municipal Medical College, Ahmedabad, Gujarat, India*
[2]*Dept. of Obstetrics & Gynecology, SVP Hospital, Ahmedabad, Gujarat, India*

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ABSTRACT

Jaundice in pregnancy is an uncommon condition, affecting less than 5% of pregnant women globally and it carries a high risk of maternal and perinatal mortality. Although there are various causes of jaundice in pregnancy, viral hepatitis infection is the most common cause in India. This is a case of a 28-year old woman, in her third trimester who presented with severe nausea, vomiting and edema in her extremities. Laboratory tests revealed severe oligohydramnios with altered blood and electrolyte profile. A clinical diagnosis of jaundice in pregnancy was made and the patient underwent an emergency caesarean section due to the high-risk nature of her pregnancy. The causes of jaundice in pregnancy include acute fatty liver of pregnancy (AFLP), hyperemesis gravidarum, hemolysis and elevated liver enzymes and low platelets (HELLP) syndrome, viral hepatitis and intrahepatic cholestasis of pregnancy. Due to the acute onset of her condition and based on the principle of elimination, acute fatty liver of pregnancy was suspected as the cause of jaundice in this patient. After delivery, the patient received several blood transfusions and was placed on conservative treatment for a week. Both, mother and child, recovered well and were discharged without any complications.

1. Introduction

Several physiological changes occur in a woman's body during pregnancy to accommodate the growing fetus and aid its development. The mother's plasma volume increases significantly resulting in hemodilution and a low hematocrit due to a decrease in her serum protein concentrations, importantly albumin and coagulation factors.[1] However, for diagnosis and treatment purposes, physiological changes must be distinguished from pathological changes.

Pregnant patients with pre-existing liver diseases like portal hypertension and cirrhosis have to be well monitored and treated timely to prevent further complications.[2] Certain liver diseases that are exclusive to pregnancies include acute fatty liver of pregnancy (AFLP), hyperemesis gravidarum, hemolysis and elevated liver enzymes and low platelets (HELLP) syndrome and intrahepatic cholestasis of pregnancy.[3] Acute viral hepatitis may also occur in a normal pregnancy without liver involvement or if the patient has had a prior liver transplantation. Patients who develop liver disease during their pregnancies often suffer from nausea, vomiting, jaundice, dizziness, peripheral edema and/or abdominal pain.[4] However, these signs and symptoms are not specific and cannot determine the underlying cause of liver involvement.

Laboratory investigations provide a standard for differential diagnosis of liver disease in pregnancy. Serum albumin levels typically drop as early as the first trimester but alanine and aspartate aminotransferase activity (previously known SGPT, SGOT respectively) levels in the serum remain relatively stable as compared to a non-pregnant woman.[1] In such cases, altered liver enzymes

* *Corresponding author*.
E-mail address: georgemonica33@gmail.com (M. George).

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prove to be an important diagnostic tool for liver disease in pregnancy.

2. Case Presentation

The patient, a 28-year old primigravida, 35 weeks of gestation, complained of severe nausea, vomiting and considerable fatigue five days prior to her hospital visit. She was up-to-date with her antenatal checkups and her first two trimesters were fairly uncomplicated apart from mild anemia and vomiting early on in the first trimester. An ultrasound, taken two weeks prior to her hospital visit, showed normal physiological changes. The liver and kidney scans, at the time, were normal and the patient had mild hydronephrosis and dilated ureters which are common sequels of pregnancy (Figure 1). However, the patient had low liquor and her AFI was 3 cm (Figure 2). A typical amniotic fluid index (AFI) score is 5-25 cm and less than 5 cm is considered oligohydramnios.[5]

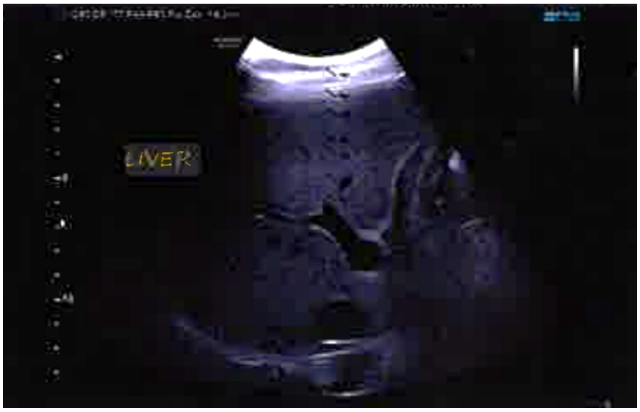

Fig. 1: Normal sized liver two weeks prior to hospital admission

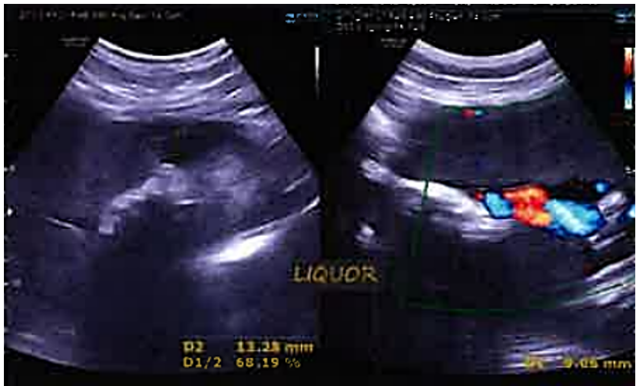

Fig. 2: USG scan, two weeks prior to the hospital admission, showing oligohydramnios

During clinical examination, the attending physician noted pedal edema and icterus; her blood pressure was elevated – 138/80 mmHg. The patient had no relevant medical history and has had no history of chronic paracetamol or aspirin usage. Her HIV status was negative and rapid tests of hepatitis B, hepatitis C and hepatitis E also resulted negative.

During this visit, her AFI, calculated with the help of ultrasound by taking the sum of the deepest vertical pockets in each abdominal quadrant, was only 1-2 cm indicating severe oligohydramnios.[5] Her abdominal scan showed a slightly enlarged liver with fatty changes (Figure 3). Laboratory investigations reported dimorphic RBCs with marked anisopoikilocytosis, leukocytosis and abnormal liver and renal function tests as well altered lipid profile. She was euglycemic but her blood pressure at the time of admission was 140/80 mmHg.

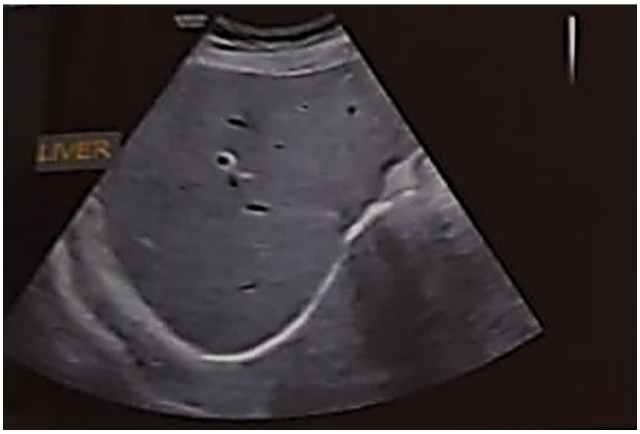

Fig. 3: USG scan of the patient showing mild hepatomegaly

The patient had a very low Bishop's score of 3, and she consented to an emergency lower segment caesarean section (LSCS). Prior to being anesthetized for the surgery, the patient received four fresh frozen plasma transfusions, two cryoprecipitate transfusions and four platelet transfusions. LSCS was performed without any complications, after which the patient's hematological tests were done (Table 1).

Both, mother and child, remained in the intensive care unit for a week.

Patient's lab values right after delivery which were compared to reference ranges. Results were altered LFTs, altered RFTs, anemia and coagulopathy. [Numbers in bold denote abnormal values].

Patient's biochemical investigations showed abnormal lipid profile. HDL levels were severely low while VLDL levels were increased. The cholesterol-to-HDL ratio was significantly high as well.

3. Discussion

In India, every 1 in 1000 cases of pregnancy is complicated by jaundice, mostly due to viral hepatitis, leading to increased maternal and fetal morbidity.[6] To successfully identify and treat the causes of jaundice in pregnancy, it is

Table 1: Laboratory investigations obtained immediately post-LSCS

Lab investigations	Patient's values	Normal Range
Hemoglobin (g/dL)	8.4	9.5 – 15
Total Leucocyte count ($\times 10^9$/L)	20.09	6 – 16
Platelet ($\times 10^9$/L)	179	145 – 400
Blood Urea (mg/dL)	10.7	5 – 20
Uric Acid (mg/dL)	6.4	2.4 – 6.0
Creatinine (mg/dL)	1.19	0.4 – 0.8
Serum LDH (U/L)	774	82 – 524
Plasma Na^+(mmol/L)	134	130 – 140
Plasma K^+ (mmol/L)	4.52	3.3 – 5.1
Blood Ammonia (μg/dL)	130.8	19 – 60
ALT (U/L)	168	10 – 49
AST (U/L)	214	0 – 34
Serum Alkaline Phosphatase (U/L)	264	0 – 129
Gamma Glutamyl Transferase (U/L)	664	5 – 55
Total Bilirubin (mg/dL)	8.70	0.3 – 1.2
Direct Bilirubin (mg/dL)	7.16	0 – 0.3
Indirect Bilirubin (mg/dL)	1.54	0.1 – 0.5
Serum Protein (g/dL)	4.54	5.7 – 8.2
Serum Albumin (g/dL)	2.29	3.2 – 4.8
Serum Globulin (g/dL)	2.25	2 – 3.5
Albumin/Globulin Ratio	1.02	1.5 – 2.5
PT (seconds)	42.9	8.6 – 12.4
APTT (seconds)	69.7	26 – 35
D-DIMER (μg/mL)[3]	20.1	0.14 – 2.82

Table 2: Lipid profile (follow-up visit)

Lab investigations	Patient's values	Normal Range
Cholesterol (mg/dL)	106.0	110 – 200
HDL (mg/dL)	8.0	40 – 60
Triglycerides (mg/dL)	282.0	40 – 200
VLDL (mg/dL)	56.4	10 – 40
LDL (mg/dL)	73.00	0 – 100
Cholesterol/HDL ratio	13.25	0 – 4.1

important to differentiate various causes of liver diseases present during pregnancies such as acute fatty liver of pregnancy (AFLP), hyperemesis gravidarum, hemolysis and elevated liver enzymes and low platelets (HELLP) syndrome, viral hepatitis and intrahepatic cholestasis of pregnancy.[2]

Excessive vomiting during pregnancy, especially during 2^{nd} and 3^{rd} trimester, should raise suspicions of liver involvement. Hyperemesis gravidarum is extreme and persistent nausea and vomiting, resulting in rapid weight loss due to the perpetual state of dehydration and electrolyte imbalance throughout the course of the pregnancy.[7] This patient, however, had a steady weight gain throughout her pregnancy progressed and her vomiting presented acutely, five days prior to her admission, leaving her tired and unable to get up from bed.

Although viral hepatitis is the leading cause of jaundice in pregnancy in India, this patient has had no prior liver transplantation or history of liver disease. Hepatitis B and hepatitis C rapid tests returned negative, ruling out viral hepatitis as a cause of jaundice in this case.

Intrahepatic cholestasis of pregnancy (ICP) results in persistent itching without a rash, especially during nighttime due to elevated serum bile acid levels.[8] Pruritus and other signs of ICP such as hematuria and pale stools were absent in this patient and therefore, intrahepatic cholestasis of pregnancy was ruled out as well.

Hemolysis and elevated liver enzymes and low platelets (HELLP) syndrome, categorized under hypertensive disorders of pregnancy, is often confused with acute fatty liver of pregnancy due to overlapping signs of altered liver function tests, high WBC and low platelets.[9] Most patients suffering from this disease have new onset hypertension with blood pressure > 140 mmHg in their third trimester or within 48 hours of delivery. According to the Tennessee classification, all three criteria must be met to make a diagnosis of HELLP syndrome.[9] The criteria are:

1. Hemolysis with at least 2 of the findings – peripheral smear with schistocytes and burr cells or serum bilirubin >1.2 mg/dl or serum haptoglobin (<25mg/dl) or LDH> two times the upper level of the normal or severe anemia with hemoglobin <8 to 10 g/dL.
2. Elevated liver enzymes: AST or ALT > 2 times the upper level of normal.
3. Low platelets: <100,000 cells/ μL.

While this patient did have hypertension with elevated liver enzymes and low platelet count post-delivery, her blood pressure was always 140 mmHg or below. HELLP syndrome was not be confirmed in this case as the patient did not meet the criteria of hemolysis. Her peripheral blood smear did not reveal any burr cells or schistocytes. Her bilirubin levels were high but her hemoglobin remained above 8 g/dL and her LDH levels did not exceed 800 U/L (normal LDH during third trimester is 82 – 524 U/L).

Another rare liver disease of pregnancy is acute fatty liver of pregnancy (AFLP). It is linked to fetus' impaired fatty acid metabolism and is a potentially fatal complication that occurs during the third trimester.[10] AFLP is characterized by acute hepatitis failure resulting from fatty infiltration of the liver, leading to coagulopathy and in more severe cases, multi-systemic involvement.[10]

The 'Swansea criteria' is accepted as the tool for diagnosing AFLP in the absence of other causes of liver damage.[11] The criteria lists the fourteen symptoms and laboratory findings which normally occur in patients of AFLP including –

1. Vomiting
2. Encephalopathy
3. Abdominal pain
4. Polyuria or polydipsia
5. Hypoglycemia <72 mg %
6. Elevated bilirubin >14 μmol/L (0.8 mg %)
7. Elevated uric acid >340 μmol/L (5.7 mg %)
8. Leukocytosis >11 $\times$ 10^9/L
9. Ascites or bright liver (due to steatosis) on ultrasound
10. Elevated transaminases
11. Elevated ammonia
12. Creatinine > 1.7 mg %
13. Prothrombin time more than 14 seconds or activated partial thromboplastin time more than 34 seconds
14. Microvesicular liver steatosis (liver biopsy)

If six or more of the above features are present, then a diagnosis of AFLP can be made.[11] Hyperbilirubinemia is usually evident as a result of hemolysis but bilirubin levels in HELLP syndrome rarely exceed 2 mg/dL and most patients have a blood sugar level less than 72 mg%.

This patient met eight of the fourteen findings in Swansea criteria – vomiting, elevated bilirubin, elevated uric acid, leukocytosis, liver changes on USG, elevated serum transaminases, elevated ammonia level and prothrombin time > 14 seconds.

Through the process of elimination, acute fatty liver of pregnancy (AFLP) was suspected as the cause of this patient's jaundice due to the acute nature of her symptoms and altered coagulation profile. However, one of the main feature of HELLP that differentiates it from AFLP, that is, profound hypoglycemia was absent in this patient. She had normal blood glucose levels throughout the course of her monitoring. AFLP could not be confirmed as the definite diagnosis because a liver biopsy was not performed.[12]

3.1. Treatment & Outcome

The patient's post-partum blood pressure, pulse and temperature on repeated examinations were within standard range; her respiratory and cardiovascular clinical examinations were normal as well. The patient remained under observation for a week post-delivery and was primarily on conservative treatment with intravenous antibiotics, electrolytes and albumin daily for 5 days.

More than 72 hours after her delivery, her platelet count fell to 65.0$\times$$10^9$/L. She received series of blood transfusions with fresh frozen plasma and cryoprecipitate after which her platelet count returned to normal. USG scan of her abdomen, taken post-operatively, still showed mild hepatomegaly but there was significant decrease in her liver enzymes. Her blood investigations returned normal apart from mild anemia.

The child, with a birth weight of 2.76 kg, was kept under observation in the neonatal intensive care unit for a week. The patient and her child recovered steadily and had no complications. They were discharge thereafter.

However, during the follow-up a week later, her total bilirubin (3.63 mg/dL) and high ceruloplasmin level (36.8 mg/dL) were elevated again. Her ultrasound still showed increased liver size and she also had severely low HDL value but high triglyceride level (Table 2). She advised to make lifestyle modifications and was referred to the internal medicine department of the hospital.

Unfortunately, two weeks after the discharge, the child passed away due to unknown causes and the parents did not consent to a post-mortem examination of the baby.

4. Conclusion

AFLP is a life threatening disease that requires thorough monitoring and investigation. Suspicion of this disease should prompt immediate patient admission to permit an early diagnosis and urgent delivery of the child. Early intervention and treatment of complications are important in order to prevent maternal and fetal deaths due to AFLP.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Morton A. Hematological Normal Ranges in Pregnancy. In: Chen KK, Lowe S, editors. Maternal Medical Health and Disorders in Pregnancy. vol. Vol 8. UK: The Global Library of Women's Medicine's; 2021.
2. Desai A, Parikh S, Mishra S. Fetomaternal Outcome in Jaundice Complicating Pregnancy. *Indian J Obstet Gynecol*. 2020;8(1):9–14.
3. Mikolasevic I, Filipec-Kanizaj T, Jakopcic I, Majurec I, Brncic-Fischer A, Sobocan N, et al. Liver Disease During Pregnancy: A Challenging Clinical Issue. *Med Sci Monit*. 2018;24:4080–90.
4. Sharma AV, John S. Liver Disease In Pregnancy [Internet]. Treasure Island (FL): StatPearls Publishing; 2021. Available from: https://www.ncbi.nlm.nih.gov/books/NBK482201.
5. Hebbar S, Rai L, Adiga P, Guruvare S. Reference ranges of amniotic fluid index in late third trimester of pregnancy: what should the optimal interval between two ultrasound examinations be? *J Pregnancy*. 2015;2015:319204. doi:10.1155/2015/319204.
6. Singh K. Jaundice in pregnancy: A clinical case study in the Hospital of North India. *Asian J Biomed Pharm Sci*. 2016;6(57):51–3.
7. Sheehan P. Hyperemesis gravidarum–assessment and management. *Aust Fam Physician*. 2007;36(9):698–701.
8. Pillarisetty LS, Sharma A. Pregnancy Intrahepatic Cholestasis [Internet]. Treasure Island (FL): StatPearls Publishing; 2022. Available from: https://www.ncbi.nlm.nih.gov/books/NBK551503/.
9. Rao D, Chaudhari NK, Moore RM, B J. HELLP syndrome: a diagnostic conundrum with severe complications. *BMJ Case Rep*. 2016;p. 5015173–5015173.
10. Naoum EE, Leffert LR, Chitilian HV, Gray KJ, Bateman BT. Acute Fatty Liver of Pregnancy: Pathophysiology, Anesthetic Implications, and Obstetrical Management. *Anesthesiology*. 2019;130(3):446–61.
11. Hadi Y, Kupec J. Fatty Liver In Pregnancy. In: StatPearls [Internet. StatPearls Publishing; 2022.

12. Werner CJ, Zoller DP, Baskin WN, Eichmann RE. Acute Fatty Liver of Pregnancy Associated With Maternal and Fetal Metabolic Acidosis. *J Fam Pract*. 1988;26(2):198–3.

Author biography

Monica George, Intern Doctor https://orcid.org/0000-0001-9567-9527

Purvi Parikh, Assistant Professor https://orcid.org/0000-0002-5004-8374

Akanksha Chandekar, Intern https://orcid.org/0000-0001-6013-2150

Prachi Meghani, Resident https://orcid.org/0000-0001-5766-0155

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