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Original Article

HELLP Syndrome in a Pregnant Woman: A Case Report

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Abstract:

Introduction: HELLP syndrome is a severe complication of hypertensive pregnancy disorders. This report describes a case of postpartum-onset HELLP syndrome with atypical presentation.

Patient Concerns: A 42-year-old pregnant woman at 36 weeks presented with severe hypertension (180/109 mmHg). HELLP syndrome was diagnosed postoperatively based on laboratory findings: elevated liver enzymes (AST 1394.7 IU/L, ALT 667.5 IU/L), high LDH (2517.1 U/L), and low platelets (35 × 10^9/L). The patient showed tea-colored urine, indicating hemolysis.

Diagnosis: HELLP syndrome.

Interventions: Management included magnesium sulfate for seizure prophylaxis, urapidil and nicardipine for blood pressure control, liver protection therapy, and corticosteroids.

Outcomes: After 4 days of ICU care, the patient's condition stabilized with improved laboratory parameters.

Clinical Significance: HELLP syndrome can develop postpartum and requires vigilant monitoring and multidisciplinary management.

Abbreviations: HELLP syndrome = hemolysis, elevated liver enzymes and low platelets count syndrome

Keywords: HELLP syndrome; Postpartum; Case report; Hypertension; Pregnancy complications

1. Introduction

HELLP syndrome (Hemolysis, Elevated Liver enzymes, and Low Platelets) represents a critical complication of hypertensive disorders during pregnancy, characterized by highly variable clinical manifestations. These range from asymptomatic presentations to spontaneous liver rupture, with severity levels that may threaten both maternal and fetal lives. It is important to note that maternal risks associated with HELLP syndrome do not cease upon termination of pregnancy. Postpartum patients remain vulnerable to multiple complications, including stroke, eclamptic seizures, hepatic dysfunction, and subcapsular liver hematoma. With the increasing incidence of HELLP syndrome, anesthetic and postoperative management for these patients presents substantial challenges[1]. This article reports a case of HELLP syndrome with complex and subtle clinical features, where timely diagnosis and intervention led to successful maternal recovery and discharge.

2. Case Report

A 42-year-old female, with a height of 160 cm, weight of 68 kg, and BMI of 22.58 kg/m², was admitted as an emergency on September 17, 2023, at 15:38 due to "cessation of menses at 36 weeks, elevated blood pressure for 2 days, and worsening dizziness and blurred vision for 1 day." She had been previously healthy with no history of systemic diseases or family genetic disorders. Regular prenatal check-ups had been initiated at the Changchun Maternity Hospital from 13 weeks

of gestation.

Upon admission, she reported elevated blood pressure for two days and worsening symptoms over the past day. Her blood pressure was 180/109 mmHg, heart rate 80 bpm, and respiratory rate 20 breaths/min. She had been taking oral labetalol and nifedipine for hypertension. The patient reported no chest pain, abdominal pain, or vomiting. Immediate management included ECG monitoring, peripheral IV access, administration of magnesium sulfate for anticonvulsant therapy, and completion of auxiliary and laboratory tests. Laboratory results upon admission were as follows: complete blood count: WBC 8.68×10⁹/L, HGB 122.0 g/L, PLT 133.0×10⁹/L; coagulation function: PT 10.6 s, APTT 29.6 s, INR 0.91; cardiac injury marker: NT-proBNP 2704 pg/ml. Following admission, her blood pressure remained at 180/109 mmHg. Treatment with nifedipine, labetalol, and magnesium sulfate led to some symptomatic relief. An ECG showed no abnormalities. The patient initially declined surgical intervention; however, after repeated discussions regarding the unstable and deteriorating condition, the family consented to emergency surgery for termination of pregnancy.

The patient underwent the procedure under epidural anesthesia. Intraoperative circulation was stable, the surgery was completed successfully within one hour, with an estimated blood loss of less than 300 ml and a urine output of 100 ml. Postoperative management included adjustment of antibiotics to cefotaxime for infection prophylaxis, continued intravenous magnesium sulfate, nifedipine and labetalol for blood pressure control, and restricted fluid intake. Six hours post-surgery, the patient developed nausea, vomiting, and dizziness, but no blurred vision. She passed approximately 800 ml of tea-colored urine. Continuous monitoring of ECG, blood pressure, and oxygen saturation was maintained, with low-flow oxygen via nasal cannula. Emergency laboratory tests were performed. Results confirmed HELLP syndrome: ALT 667.5 IU/L, AST 1394.7 IU/L, LDH 2517.1 U/L, total bilirubin 72.7 μmol/L, platelet count 35×10⁹/L. The patient's condition deteriorated rapidly several hours after cesarean delivery, presenting critical challenges: severe hypertension increasing myocardial load; elevated AST, ALT, LDH indicating liver involvement; and significantly reduced platelets. Changes in laboratory findings and thromboelastography are shown in Tables 1, 2, and Picture 3. The change in urine color is shown in Picture 4.The following targeted interventions were implemented:

1. Magnesium sulfate for anticonvulsant therapy; oral nifedipine and labetalol for hypertension. Due to inadequate blood pressure control, urapidil and nicardipine were administered via intravenous infusion.

2. Maintenance of a quiet environment, rest, and prevention of eclampsia.

3. Intravenous administration of glycerin and glutathione for liver protection.

4. Correction of hypoalbuminemia.

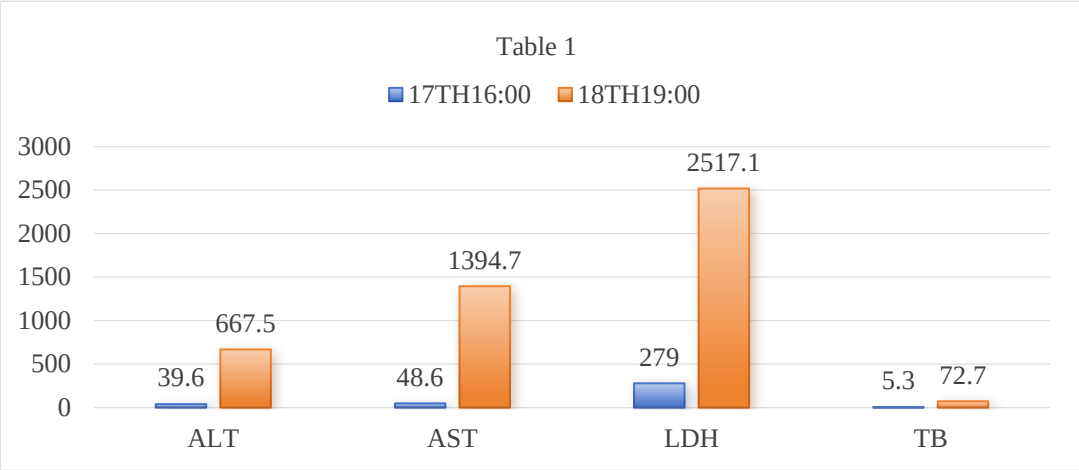
5. Prevention of cerebral edema and hemorrhage.

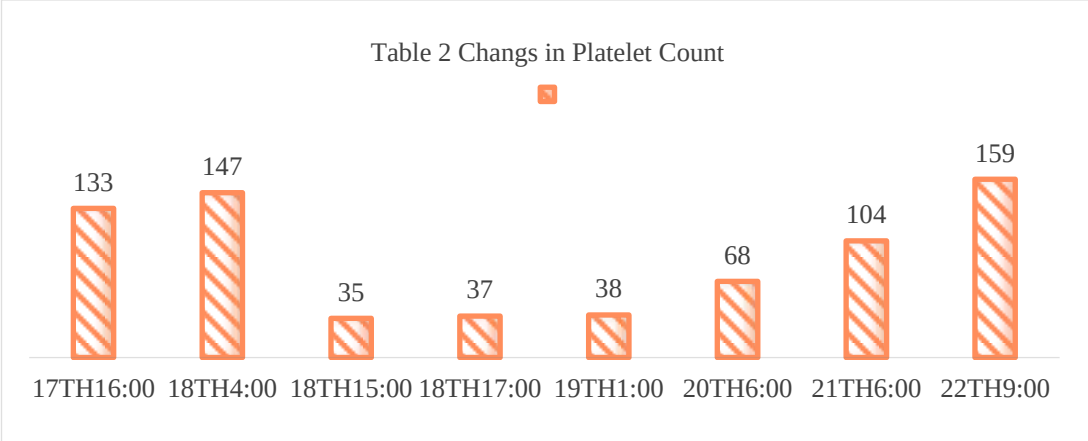
6. Intramuscular nadroparin for thrombosis prophylaxis.

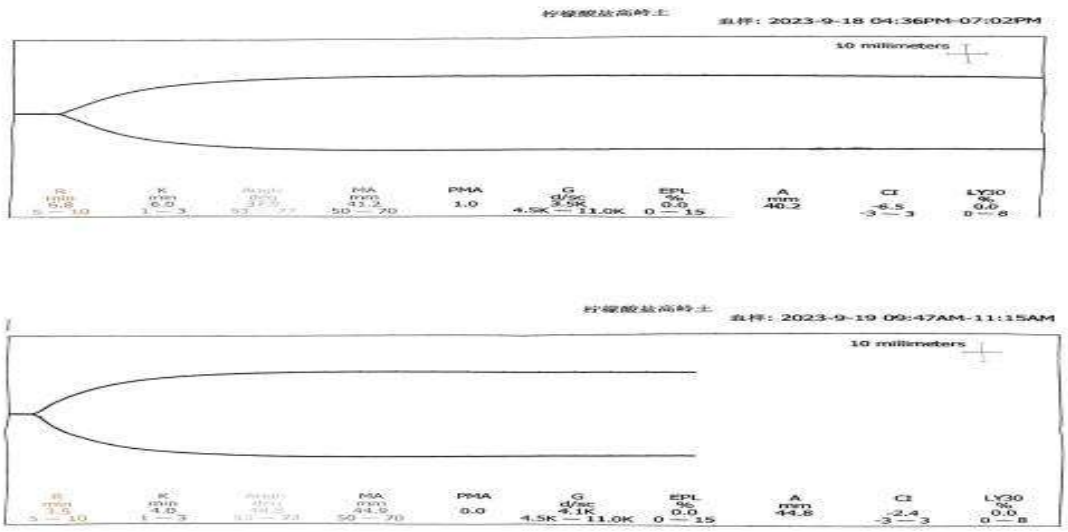
7. Administration of hydrocortisone.

8. Ambroxol via aerosol inhalation for expectoration. 9. Oral vitamin B6 and raw malt for lactation suppression, alongside enhanced nutrition.

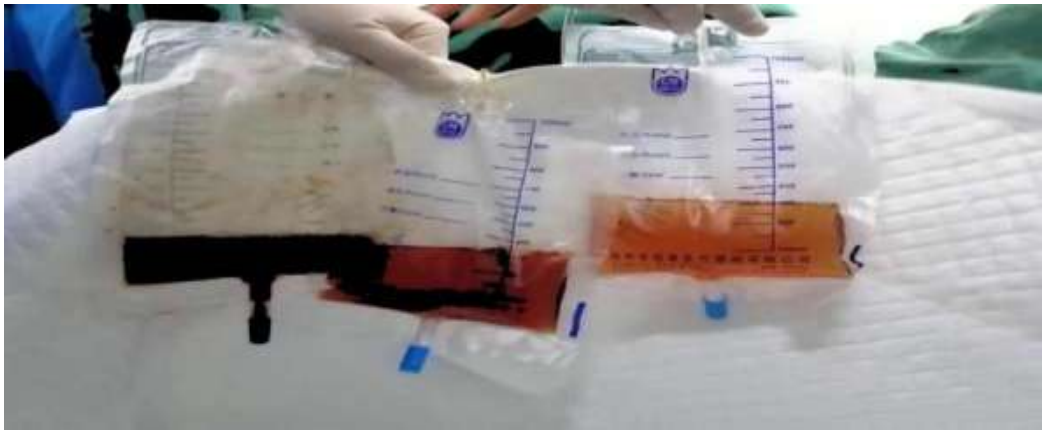
After four days of treatment in the ICU, the patient's condition improved, allowing for transfer back to the general ward.







Picture 3 TGE



Picture 4 Changes in Urine Color

3. Discussion

HELLP syndrome, characterized by hemolysis, elevated liver enzymes, and low platelet count, is a severe complication of hypertensive disorders in pregnancy. It occurs most frequently during the mid to late stages of gestation, with approximately 70% of cases diagnosed antepartum and 30% diagnosed postpartum. Historically, HELLP syndrome was considered a serious complication of severe preeclampsia, with 5% to 20% of patients with severe preeclampsia progressing to HELLP syndrome[2].Current perspectives indicate that HELLP syndrome is recognized as an independent disease entity, although its pathophysiological processes closely resemble those of severe preeclampsia[3].Maternal complications of HELLP syndrome include disseminated intravascular coagulation (DIC), placental abruption, subcapsular liver hematoma, pulmonary edema, pleural effusion, acute renal failure, significant ascites, wound hematoma, retinal detachment, vitreous hemorrhage, and blindness. Maternal mortality rates range from 1% to 30%, while fetal mortality rates vary between 7.4% and 34%[4].

The pathogenesis of HELLP syndrome is similar to that of preeclampsia[5], It is primarily attributed to vascular endothelial damage and placental dysfunction, with involvement of autoimmune mechanisms, leading to erythrocyte destruction, platelet activation and consumption, and hepatocyte necrosis[6].HELLP syndrome occurs in approximately 0.5% to 0.9% of all pregnancies and accounts for about 20% of cases of severe preeclampsia. The pathogenesis of subcapsular liver hematoma in HELLP syndrome remains unclear. It may result from vasospasm causing endothelial cell injury, fibrin deposition leading to hepatic sinusoidal congestion, followed by hepatocellular ischemia, hypoxia, and necrosis. This hepatic necrosis progresses to intrahepatic hemorrhage, which expands until a subcapsular hematoma forms, most commonly occurring in the right lobe of the liver[7] .

HELLP syndrome typically manifests between 27 and 37 weeks of gestation. Its clinical presentation often includes upper abdominal pain, nausea, vomiting (occurring in 30%–90% of cases), headache (30%–60%), visual disturbances (20%), and jaundice (5%). Notably, approximately 15% of cases exhibit an insidious onset or atypical symptoms[8]. A small number of patients may experience ankle edema, hematuria, petechiae or ecchymoses, proteinuria, ascites, intrauterine growth restriction, papilledema, and pulmonary rales. The fetus may exhibit

intrauterine growth restriction; however, the clinical presentation in this parturient was atypical[9].

The diagnosis of HELLP syndrome primarily relies on laboratory findings. The main diagnostic criteria, as established by the American College of Obstetricians and Gynecologists (ACOG), are as follows[10]: LDH ≥600 U/L, elevation of ALT and AST to more than twice the upper limit of normal, and a platelet count <100×10⁹/L.

Therapeutic Principles for HELLP Syndrome: The definitive management for HELLP syndrome involves termination of pregnancy as the primary intervention, accompanied by comprehensive supportive care aimed at controlling hypertension, administering corticosteroids, implementing judicious platelet transfusion, and actively preventing and managing complications[11].

Anesthetic Management for Parturients with HELLP Syndrome: Due to airway mucosal edema, significant weight gain, limited neck mobility, and increased Mallampati score, the risk of difficult intubation after induction in parturients with HELLP syndrome is 8 times higher than in the general population[12]. Thus, airway management must be emphasized in their anesthesia care. The selection of anesthesia for parturients with HELLP syndrome requires comprehensive consideration of multiple factors, including the patient's platelet count, the urgency of the surgery, and the patient's overall condition. Generally, neuraxial anesthesia is preferred when feasible. Additionally, meticulous blood pressure management is crucial, as both hypertension and hypotension can lead to adverse outcomes. During general anesthesia, special attention must be paid to preventing a sharp increase in blood pressure caused by tracheal intubation or extubation. Conversely, during neuraxial anesthesia, the primary goal is to avoid the occurrence of hypotension[13]. Although patients with HELLP syndrome are in a state of absolute hypovolemia, fluid administration during anesthetic management must be strictly controlled, typically at a rate of approximately 100 mL/h[14]. Prehydration is not recommended prior to neuraxial anesthesia, as it significantly increases the risk of acute cardiac insufficiency and pulmonary edema. Given the elevated risk of hemorrhage, continuous monitoring of platelet counts is essential in these parturients. Platelet transfusion should be considered when the count falls below 50×10⁹/L to prevent the onset of disseminated intravascular coagulation (DIC) or placental abruption—a condition known to predispose to DIC. Postpartum, women with HELLP syndrome require vigilant monitoring for complications such as persistent hypertension, pulmonary edema, and impaired renal or hepatic function, as the risks associated with the syndrome extend beyond delivery[15].

Postpartum management of women with HELP syndrome: HELLP syndrome poses significant risks that do not resolve immediately upon delivery. Postpartum patients remain vulnerable to serious complications, including stroke, eclampsia, pulmonary edema, persistent hypertension, increased risk of deep vein thrombosis, cardiac insufficiency, renal dysfunction, abnormal liver function, and subcapsular liver hematoma[16]. A thorough evaluation of individual organ system functions and implementing targeted supportive therapies are essential. Consequently, a deeper understanding of the disease process, enabling early detection, accurate diagnosis, and appropriate management of these life-

threatening conditions through timely and effective clinical intervention, is crucial for improving maternal and neonatal outcomes.

4. Conclusion

This case report presents a comprehensive analysis of a 42-year-old parturient with postpartum-onset HELLP syndrome, highlighting the critical importance of vigilant monitoring and multidisciplinary management in achieving positive maternal outcomes.

Author contributions

Analysis and interpretation of data, drafting the article for important intellectual content, and final approval: Dan Han.

Conception, design, and acquisition of data: Dan Han.

Conceptualization: Zijian Guan.

Data curation: Dan Han.

Funding acquisition: Zijian Guan.

Investigation: Dan Han.

Methodology: Dan Han.

Writing - original draft: Dan Han.

Writing - review and editing: Zijian Guan.

Conflicts of Interest: The authors declare no conflicts of interest.

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