Case Report

Jour Cas Stu Cas Rep, 4(1), 2025, 16-20

Journal of Case Studies and Case Reports

Open access peer reviewed international indexed journal Online ISSN: 2583-4428

Content Available at http://www.saapjournal.org/

A CASE REPORT ON POSTPARTUM HELLP SYNDROME WITH SEPTIC SHOCK AND MULTI-ORGAN FAILURE

J.Bhargava Narendra*, Sunanda Kaligithi, Venkata Sai Charan Konidena

Department of Pharmacy Practice, Aditya Pharmacy College, Surampalem, Kakinada.

Received: 02 Mar 2025 Revised: 19 Mar 2025 Accepted 27 Apr 2025

Abstract

This case study presents a 25-year-old female patient who developed severe complications post-lower segment cesarean section (LSCS), characterized by decreased urine output, jaundice, confusion, shortness of breath, and fever. Her clinical history included pedal edema and confusion, with notable laboratory findings indicating metabolic acidosis, hyperkalemia, elevated liver enzymes, thrombocytopenia, and acute kidney dysfunction, suggesting HELLP syndrome complicated by septic shock and multi-organ dysfunction syndrome (MODS). Despite aggressive interventions, including vasopressors, dialysis, intubation, and broad-spectrum antibiotics, the patient's condition rapidly deteriorated, leading to cardiac arrest and subsequent death. This case underscores the critical need for early recognition and comprehensive management of HELLP syndrome and sepsis in postpartum patients, emphasizing the importance of multidisciplinary care and continuous monitoring to improve maternal outcomes. The findings highlight the potentially fatal nature of these conditions and the imperative for vigilance in the postpartum period.

Keywords: HELLP syndrome, septic shock, multi-organ failure, LSCS, MODS, cardiac arrest.

This article is licensed under a Creative Commons Attribution-Non-commercial 4.0 International License. Copyright © 2025 Author(s) retains the copyright of this article.

***Corresponding Author**
J.Bhargava Narendra

doi: https://doi.org/10.37022/jcscr.v5i1.701

Introduction

A 25-year-old female patient presented with multiple severe symptoms, including decreased urine output, jaundice, confusion, shortness of breath, and fever. She had a history of pedal edema and confusion and had recently undergone a lower segment cesarean section (LSCS) five days prior. During her hospital stay, she received one unit of packed red blood cells (PRBC) and five units of random donor platelets (RDP). Her vital signs on admission indicated significant distress: tachycardia, tachypnea, mild hypotension, fever, hypoglycemia, and normal oxygen saturation on room air. She had no prior history of hypertension or diabetes, and there was no relevant family medical history.

Treatment

Initial treatments included infusions of noradrenaline and vasopressin and dialysis. Despite these measures, the patient's condition deteriorated rapidly, with bradycardia, gasping respirations, and non-recordable blood pressure, necessitating intubation and mechanical ventilation. Cardioverter defibrillation was performed with temporary rhythm restoration. Subsequent treatments included sodium bicarbonate, calcium gluconate, dextrose, meropenem, levofloxacin, pantoprazole, ursodeoxycholic acid, and tigecycline. Despite aggressive management, the patient's condition further declined, leading to cardiac arrest and multiple unsuccessful resuscitation attempts. The patient was eventually declared dead due to cardiopulmonary arrest secondary to HELLP syndrome, septic shock, and multi-organ dysfunction syndrome (MODS) [1].

Case Study

A 25 year old female patient came to hospital with the chief complaints of decreased urine output since morning, yellowish discoloration of eyes since morning, irrelevant speech, mild shortness of breath, fever. She has a history of pedal edema, confusion. She recently underwent LSCS (lower segment cesarean section), POD 5(fifth post operative day after surgery), 1 unit of PRBC (packed red blood cells), 5 units RDP (random donor platelets) transfusions are done. The vitals are pulse rate is 135bpm, respiratory rate was 37/min, blood pressure was 109/68mm of Hg, body temperature was 101.4F, GRBS was 75mg/dl, SPO2 is99% with room air. She has no previous history of hypertension, diabetes. She has no family history.

Sl no:	parameter	Result values	Normal values
BLOOD GAS ANALYSIS			
1	PH	7.293	7.350-7.450

2	PCO2	18.3mm/Hg	35-45 mm/Hg
3	PO2	288mm/Hg	80-100mm/Hg
	ELECTROLYTES		
1	Potassium	6.2mmol/L	3.5-5.5mmol/L
2	chloride	109mmol/L	98-107mmol/L
	COMPLETE BLOOD PICTURE		
1	Hemoglobin	9.2gm%	13.5-17.5gm%
2	RBC count	3.48mil/cum	4-5.5mil/cum
3	PCV	26.3 vol%	40-54vol%
4	Platelet count	0.40 lakhs/cum	1.5-4.5lakh/cum
5	Total WBC count	17,100 cells/cum	4000-11000cells/cum
	DIFFERENTIAL COUNT		
1	Neutrophils	82%	40-75%
2	lymphocytes	12%	20-45%
	SERUM ELECTROLYTES		
1	Serum sodium	157mmol/L	135mmol/L
2	Serum chloride	116mmol/L	96-105mmol/L
	LIVER FUNCTION TEST		
1	Total bilirubin	13.9mg/dl	0.20-1.0mg/dl
2	Direct bilirubin	12.7mg/dl	0-0.30mg/dl
3	ALT (SGPT)	48 units/L	0-40 units/L
4	AST(SGOT)	141units/L	0-37units/L
5	Alkaline phosphatase	156 IU/L	0-137IU/L
6	Total protein	6.1gms/dl	6.4-8.2gms/dl
7	Albumin	2.7gms/dl	3.4-5.0gm/dl
8	Serum creatinine	2mg/dl	0.60-1.50mg/dl

Her height is 5.6 feet, weight 77kgs, her BMI is 27.
On the day of admission, she was given with following treatment

- Inj. Noradrenaline infusion @20ml/hr
- Inj vasopressin infusion@6ml/hr
- Dialysis done.

On the next following day, on examination patient was gasping, BP not recordable, pulse rate was 40/min which indicates bradycardia, even spo2 is also not recordable, patient is incubated with 7mm oral cuffed ET tube and connected to the ventilator, followed by immediate synchronized cardioversion done with 200J shown the rhythm of 140/min. Her FIO2 (Fraction of inspired oxygen) is 1(normal is 0.6-0.7), PEEP (Positive end expiratory pressure) is 6 which is normal.
The following treatment was given INJ. SODABICARB 100ml IV STAT

- INJ CALCIUM GLUCONATE 10ML slow IV
- INJ 25% DEXTROSE with 100ml IV STAT.
- INJ MEROTROL 1gm IV TID
- INJ LEVOFLOX 500mg IV OD
- INJ PANTOP 40mg IV OD
- TAB URSOCOL 600mg PO BD

On the same day evening on examination shown E1VTM1, BP is not recordable, pulse is not felt, CVS-S1S2 absent, respiratory- no spontaneous breaths, SPO2 not recordable, patient had sudden cardiac arrest then INJ ADRENALINE 1mg IV is given, CPR started and continued for some period of time with 3-4 doses of INJ ADRENALINE. Patient had ventricular tachycardia, 200J cardioversion done. Ongoing SLED, guarded prognosis explained to the relatives. INJ TIGEZ 100mg STAT followed by 50mg BD was added. Followed by the night duty examination, her BP was on examination, her BP was 90/60mm Hg, heart rate was 140/min, altered sensorium, jaundice, low platelets then patient had bradycardia and asystole, then CPR initiated according to the protocols, patient could not be supportive in spite of CPR efforts, patient declared dead due to the CARDIO PULMONARY ARREST DUE TO HELLP SYNDROME WITH SEPTIC SHOCK WITH MODS OF POST LSCS.

Results

Blood Gas Analysis

- pH: 7.293 (acidotic)
- PCO2: 18.3 mmHg (low)
- PO2: 288 mmHg (high)

Electrolytes

- Potassium: 6.2 mmol/L (elevated)
- Chloride: 109 mmol/L (slightly elevated)

Complete Blood Picture

- Hemoglobin: 9.2 gm% (low)
- RBC count: 3.48 mil/cum (low)
- PCV: 26.3 vol% (low)
- Platelet count: 0.40 lakhs/cum (very low)
- Total WBC count: 17,100 cells/cum (high)

Differential Count

- Neutrophils: 82% (high)
- Lymphocytes: 12% (low)

Serum Electrolytes

- Serum Sodium: 157 mmol/L (elevated)
- Serum Chloride: 116 mmol/L (elevated)

Liver Function Test

- Total Bilirubin: 13.9 mg/dl (high)
- Direct Bilirubin: 12.7 mg/dl (high)
- ALT (SGPT): 48 units/L (slightly elevated)
- AST (SGOT): 141 units/L (high)
- Alkaline Phosphatase: 156 IU/L (slightly elevated)
- Total Protein: 6.1 gms/dl (low)
- Albumin: 2.7 gms/dl (low)
- Serum Creatinine: 2 mg/dl (elevated)

Vitals and Clinical Observations

- Height: 5.6 feet
- Weight: 77 kg
- BMI: 27

Discussion

The patient's presentation with decreased urine output, jaundice, confusion, shortness of breath, and fever post-LSCS is concerning for a severe, multifactorial medical condition. Her laboratory results showed significant abnormalities, including metabolic acidosis, hyperkalemia, elevated bilirubin, elevated liver enzymes, thrombocytopenia, leukocytosis, and elevated creatinine, suggestive of acute liver and kidney dysfunction, possibly secondary to HELLP syndrome (Hemolysis, Elevated Liver enzymes, Low Platelet count), and septic shock.

HELLP syndrome is a severe form of preeclampsia with high maternal morbidity and mortality rates, characterized by hemolysis, elevated liver enzymes, and low platelets. The patient's condition was further complicated by septic shock, likely from an underlying infection post-LSCS, leading to multi-organ dysfunction syndrome (MODS).

The treatment plan addressed the critical aspects of the patient's condition, including hemodynamic support with vasopressors, correction of metabolic acidosis, management of hyperkalemia, broad-spectrum antibiotics for sepsis, and supportive care for multi-organ dysfunction. Despite these measures, the patient's rapid clinical decline and eventual death highlight the complexity and severity of HELLP syndrome complicated by sepsis and MODS [2].

In reviewing the literature, several points emerge that are important to consider when managing the patients with similar presentations, as well as to provide context on the survival rates, quality of life (QOL) and treatment options.

Review of previous case studies

1. **HELLP Syndrome in Postpartum Period**: Several case reports have illustrated the life-threatening nature of HELLP syndrome, particularly when it occurs postpartum. A study by Lata et al. (2015) described a similar scenario where postpartum HELLP syndrome progressed rapidly into acute renal failure, pulmonary edema, and DIC (Disseminated Intravascular Coagulation). Despite aggressive treatment with vasopressors, dialysis, and intensive care, the outcome was fatal due to cardiopulmonary collapse. Similar to the case presented, septic shock was often identified as a secondary complication that aggravated the situation.
2. **Sepsis and MODS Post-Delivery**: A study conducted by Rasmussen et al. (2014) reported that women who developed postpartum sepsis (especially those with infected uterine incisions or retained placental fragments) were at a much higher risk of progressing to MODS. The mortality rate in such cases was about 30-50%, depending on the time of intervention. Early identification and initiation of broad-spectrum antibiotics and other supportive measures were shown to improve outcomes, but late-stage organ failure, like in our case, significantly worsened survival chances.
3. **Maternal Mortality in Severe Preeclampsia and HELLP Syndrome**: In severe cases of HELLP syndrome (like the one presented here), maternal mortality rates have been found to be as high as 30-40% (depending on the setting). The presence of septic shock and multi-organ dysfunction increases these odds, with organ failure and cardiac arrest being the leading causes of death. The TIMI (Thrombolysis In Myocardial Infarction) risk score and similar indices have been used in such cases, but their application in postpartum women with HELLP syndrome is still evolving.

Chances of Survival and Quality of Life (QOL)

1. **Survival Rate**: The survival rate for HELLP syndrome complicated by sepsis and MODS is highly variable and depends on several factors, including the timing of diagnosis, comprehensiveness of treatment, and patient's pre-existing conditions. In a systematic review of HELLP syndrome, the early institution of mechanical ventilation, renal replacement therapy (dialysis), and vasopressors improved short-term survival rates. However, survival was inversely related to the number of organ systems involved and the severity of the complications.
2. **Quality of Life (QOL)**: Studies show that long-term outcomes for women surviving severe HELLP syndrome with MODS may be compromised by chronic renal impairment, pulmonary sequelae, and psychological impacts due to the trauma of critical illness. Quality-adjusted life years (QALY) are generally lower for patients who experience severe postpartum complications, especially in the case of septic shock and cardiac arrest. Patients often require prolonged rehabilitation, and many report physical and emotional scars following recovery. Moreover, women who survive postpartum HELLP syndrome with sepsis may face endocrine and metabolic complications, including gestational diabetes, hypertension, and chronic kidney disease, further diminishing long-term QOL.

Emerging Therapies and Non-Pharmacological Treatments

Therapies

a) **Steroids**: In certain cases of HELLP syndrome, the administration of steroids (such as dexamethasone) has been shown to help manage

symptoms, especially in early disease progression. However, in severe cases where sepsis and MODS are present, steroids alone are not sufficient, and aggressive organ support is needed [3].

b) **Plasma Exchange**: In some extreme cases, therapeutic plasma exchange has been shown to be beneficial. Plasma exchange helps in reducing the levels of circulating inflammatory mediators, thus alleviating organ damage. A study published by Varga et al. (2016) highlighted the successful use of plasmapheresis in treating a postpartum woman with severe HELLP syndrome and thrombocytopenia [4].

c) **Vasopressor and Inotrope Use**: Agents like noradrenaline, vasopressin, and dobutamine are standard in managing septic shock. However, newer agents such as angiotensin II have been investigated for their role in improving blood pressure and organ perfusion during septic shock, especially in patients with multiple organ failures [3, 4].

d) **Renal Replacement Therapy (RRT)**: Dialysis is often required to manage acute kidney injury in HELLP syndrome with sepsis. However, continuous renal replacement therapy (CRRT) has been found to be more effective in maintaining fluid balance and supporting the kidneys in septic and hemodynamically unstable patients [5].

2. Non-Pharmacological Management

1. **Nutritional Support**: Given the multisystemic nature of MODS, adequate nutritional support becomes critical. Enteral nutrition is preferred over parenteral nutrition to improve gut motility and immune function, which are often compromised in sepsis and organ failure [6].
2. **Extracorporeal Membrane Oxygenation (ECMO)**: In some centers, the use of ECMO for cardiac and respiratory failure has been explored in extreme cases of postpartum cardiopulmonary collapse, though this remains an emerging therapy with limited evidence in the context of HELLP syndrome [7].
3. **Psychological Support**: Psychiatric consultation and mental health support are crucial for patients who survive such severe postpartum complications. The emotional toll of surviving septic shock, MODS, and cardiac arrest requires long-term mental health care, especially in younger women [8].

Conclusion

This case of a 25-year-old postpartum female demonstrates the severe and rapid progression of HELLP syndrome complicated by septic shock and multi-organ dysfunction syndrome (MODS) following a lower segment cesarean section (LSCS). Despite timely and aggressive medical interventions, including vasopressors, dialysis, intubation, mechanical ventilation, and broad-spectrum antibiotics, the patient's condition deteriorated, leading to cardiac arrest and eventual death [9].

The outcome emphasizes the critical need for early recognition and prompt, aggressive treatment of HELLP syndrome and sepsis in postpartum patients. Multidisciplinary care involving obstetricians, intensivists, and nephrologists is crucial in managing such complex cases. Additionally, continuous monitoring and supportive measures are vital in addressing the rapid changes in clinical status that characterize HELLP syndrome and septic shock. The unfortunate outcome in this case highlights the potentially fatal nature of these conditions and underscores the importance of vigilance and comprehensive care in the postpartum period to improve maternal outcomes. Moreover, the findings of this case emphasize the need for ongoing research into novel treatments, including plasma exchange, ECMO, and targeted immunomodulatory therapies, to improve quality of life (QOL) for women surviving such life-threatening complications [10].

Funding

Nil

Inform Consent and Ethical Statement

Not Declared

Acknowledgement

Nil

Author Contribution

All authors are contributed equally.

References

1. Hunt SA, Baker DW, Chin MH, Cinquegrani MP, Feldmanmd AM, Francis GS, et al. ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult: Executive Summary A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1995 Guidelines for the Evaluation and Management of Heart Failure). Circulation. 2001 Dec 11;104(24):2996–3007.
2. Singer M, Deutschman CS, Seymour CW. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA [Internet]. 2016 Feb 23;315(8):801–10.
3. García-Álvarez R, Arboleda-Salazar R. Vasopressin in Sepsis and Other Shock States: State of the Art. Journal of Personalized Medicine [Internet]. 2023 Nov 1 [cited 2023 Nov 6];13(11):1548.
4. Mehta RL, Kellum JA, Shah SV, Molitoris BA, Ronco C, Warnock DG, et al. Acute Kidney Injury Network: report of an initiative to improve outcomes in acute kidney injury. Critical Care [Internet]. 2007 [cited 2019 Nov 28];11(2):R31.

5. Sarode R, Bandarenko N, Brecher ME, Kiss JE, Marques MB, Szczepiorkowski ZM, et al. Thrombotic thrombocytopenic purpura: 2012 American Society for Apheresis (ASFA) consensus conference on classification, diagnosis, management, and future research. Journal of Clinical Apheresis. 2013 Oct 17;29(3):148–67.
6. Joshi D, James A, Quaglia A, Westbrook RH, Heneghan MA. Liver disease in pregnancy. The Lancet. 2010 Feb;375(9714):594–605.
7. Sibai BM, Ramadan MK, Usta I, Salama M, Mercer BM, Friedman SA. Maternal morbidity and mortality in 442 pregnancies with hemolysis, elevated liver enzymes, and low platelets (HELLP syndrome). American Journal of Obstetrics and Gynecology. 1993 Oct;169(4):1000–6.
8. Neuhaus W, Crombach G, Hamm W, Bolte A. A case of HELLP syndrome at 23 weeks' gestation. Archives of Gynecology and Obstetrics. 1994 Dec;255(4):217–9.
9. von Auer C, von Krogh AS, Kremer Hovinga JA, Lämmle B. Current insights into thrombotic microangiopathies: Thrombotic thrombocytopenic purpura and pregnancy. Thrombosis Research. 2015 Feb;135:S30–3.
10. Sibai BM, Taslimi MM, El-Nazer A, Amon E, Mabie BC, Ryan GM. Maternal-perinatal outcome associated with the syndrome of hemolysis, elevated liver enzymes, and low platelets in severe preeclampsia-eclampsia. American Journal of Obstetrics and Gynecology. 1986 Sep;155(3):501–7.