Volume 3, Issue 9, September 2025 ISSN (E): 2938-3765

LIVER DAMAGE IN HELLP SYNDROME

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Abstract

HELLP Syndrome (Hemolysis, Elevated Liver Enzymes, Low Platelet Count) – a severe complication of pregnancy associated with preeclampsia. This condition involves liver injury, significantly increasing the risk of maternal and perinatal mortality. HELLP syndrome is classified among the most severe pregnancy complications requiring urgent medical intervention. According to the World Health Organization, the prevalence of this syndrome ranges from 0.1% to 0.8% of all pregnancies; however, among women with preeclampsia and eclampsia, this figure reaches 10–20% [6]. In cases of delayed diagnosis and lack of timely treatment, maternal mortality rates can reach up to 25% [1]. In recent decades, an increase in hypertensive disorders during pregnancy has been observed, making the HELLP syndrome particularly significant. Studies show that approximately 15% of cases remain undiagnosed, which increases the risk of complications such as hepatic rupture, acute renal failure, and disseminated intravascular coagulation (DIC) [8]. The syndrome is more frequently diagnosed in women over 30 years old, with chronic illnesses, obesity, and multiple pregnancies [5].

Introduction

Pathogenesis: The mechanisms underlying HELLP syndrome are not fully elucidated. The causes of this multifactorial disease are attributed to abnormal vascular tone and coagulation defects, but no definitive link has been established between them. The syndrome appears to be a terminal manifestation of preeclampsia, where microvascular endothelial injury leads to intravascular platelet activation. This results in the release of thromboxane A2 and serotonin, causing vasospasm, further platelet agglutination and aggregation, and endothelial damage. This process creates a self-perpetuating vicious cycle.

Hemolysis in HELLP syndrome is a microangiopathic hemolytic anemia. Erythrocytes become fragmented as they pass through small blood vessels, with associated endothelial injury and fibrin deposition. Peripheral blood smears may reveal spherocytes, schistocytes, triangular cells, and burr cells.

Increased liver enzyme levels are considered secondary to obstruction of hepatic blood flow caused by fibrin deposits in the sinusoids. This occlusion can lead to periportal necrosis, and in severe cases, intracapsular hemorrhage, subcapsular hematoma, or hepatic rupture. Thrombocytopenia results from increased consumption and/or destruction of platelets. Although some researchers suggest that disseminated intravascular coagulation (DIC) is a primary process in HELLP syndrome, most patients do not show coagulation abnormalities in standard tests. Patients who develop DIC typically have HELLP syndrome, but not all with HELLP exhibit coagulopathy.

Hepatic lesions in preeclampsia can be heterogeneous: some changes are subclinical, such as fibrin deposition in hepatic sinusoids, while others are ischemic, leading to infarctions, subcapsular

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hematomas, or hepatic rupture in extensive hematomas. Liver injury in HELLP syndrome involves several pathological processes. Microangiopathic hemolysis causes endothelial damage in hepatic vessels and microthrombus formation [4]. DIC induces microthromboses, hepatocyte ischemia, and necrosis [7]. Vascular hypoperfusion exacerbates hepatic ischemia, further damaging the tissue [2]. Increased vascular permeability causes hepatic edema and intraparenchymal hemorrhages [3]. Clinical manifestations**:** Patients with HELLP syndrome may present with right upper quadrant pain, nausea, vomiting, jaundice, elevated ALT and AST levels, subcapsular hematomas, and in rare cases, hepatic rupture. Diagnosis: Key diagnostic methods include laboratory investigations (elevated ALT, AST, thrombocytopenia, hemolysis markers), coagulation profile (to detect DIC), liver ultrasound (edema, hematomas), MRI, and CT scans for detailed assessment of hepatic damage. Management**:** Main approaches include urgent delivery, infusion therapy, corticosteroids, platelet transfusions, antihypertensive treatment, and renal function monitoring. HELLP syndrome remains one of the most serious pregnancy pathologies, requiring early diagnosis and comprehensive management. Proper obstetric care reduces maternal and perinatal mortality risks. Further research is necessary to optimize management strategies for pregnant women affected by this condition.

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