

Acute Fatty Liver of Pregnancy and Mimicking Alleviating Factors: A True Diagnostic Challenge in Resource-Limited Settings. Case Report and Literature Review

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ABSTRACT

Acute fatty liver of pregnancy (AFLP) is a rare but potentially life-threatening obstetric complication, with an estimated incidence ranging from 1 in 7,000 to 20,000 pregnancies. Despite advances in diagnosis and treatment, its high maternal–fetal morbidity and mortality rates make it a true clinical challenge, particularly in hospitals with limited resources. This paper presents a complex clinical case with multiple variants simulating other pathologies, along with a comprehensive literature review that integrates international, regional, and national evidence. The analysis focuses on the diagnostic difficulty posed by differential entities such as HELLP syndrome, intrahepatic cholestasis, viral hepatitis, autoimmune diseases, dyslipidemias, and abdominal tumors. In addition, key clinical and laboratory tools—particularly the Swansea criteria—are highlighted as essential for standardizing diagnosis when specialized tests are unavailable. Based on the literature synthesis and the case analysis, a diagnostic algorithm and a table of pragmatic strategies tailored for low-resource settings are proposed, aiming to reduce delays and improve maternal–fetal outcomes.

KEYWORDS: Acute fatty liver of pregnancy; HELLP syndrome; differential diagnosis; autoimmunity; dyslipidemia; low-resource settings; maternal–fetal morbidity and mortality.

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PROBLEM STATEMENT

Acute fatty liver of pregnancy (AFLP) is a rare complication of pregnancy, with an estimated global incidence of 1 in 7,000 to 20,000 pregnancies. ⁶ Although maternal mortality has been reduced from historical figures above 70% to current ranges of 7–12%, and fetal mortality to 9–15%, this disease still represents a significant threat to maternal-fetal health. ⁹ In Latin America, evidence is limited to isolated reports and small series showing late diagnoses and higher morbidity and mortality, largely due to lack of access to specialized tests and underutilization of clinical algorithms. ¹⁷

In Mexico, the cases described come mainly from tertiary hospitals, which suggests an epidemiological underreporting and a high risk of underdiagnosis in general hospitals with limited resources.

Therefore, the central problem is THAT AFLP presents with clinical and biochemical characteristics similar to multiple diseases, which generates delays in diagnosis and in early obstetric interruption, considered the most effective intervention to reduce mortality. ¹⁵

The purpose of this review is to integrate global, regional, and national evidence, delve deeper into diseases that mimic this

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pathology, and offer diagnostic tools applicable even in resource-constrained settings, where the clinical challenge is greater.

INTRODUCTION

Acute fatty liver of pregnancy (AFLP) is a rare condition, with an estimated incidence of 1 in 7,000 to 20,000 pregnancies, reflecting both its low frequency and the difficulty of obtaining large series to guide clinical practice^{6,9}. Despite this rarity, it represents a problem of great importance due to its high maternal-fetal morbidity and mortality, as it constitutes a true diagnostic and therapeutic challenge, since it shares clinical manifestations with entities such as HELLP syndrome, intrahepatic cholestasis, viral hepatitis, autoimmune diseases, and certain metabolic disorders.

This paper presents a complex clinical case with multiple clinical variations that mimic other pathologies, illustrating the difficulty of managing it in hospital settings. To provide greater clarity and depth, a literature review is conducted, integrating data reported in international and regional studies, highlighting the importance of timely diagnosis and immediate obstetric management as fundamental measures for improving maternal-fetal prognosis.

Thus, the analysis of this complex clinical case and the literature review aim to deepen the understanding of acute fatty liver of pregnancy, clarify the multiple diseases that can mimic its presentation, and provide useful diagnostic and therapeutic tools for healthcare professionals. The goal is to offer a clearer and more well-founded overview that contributes to the timely recognition of this condition and the reduction of its morbidity and mortality in hospital settings, particularly those with limited resources.

BACKGROUND

Acute fatty liver of pregnancy (AFLP), first described in 1934 by Stander and Cadden as “idiopathic acute liver disease of pregnancy,” is now considered one of the most serious and rare obstetric complications. Its worldwide incidence is estimated at 1 in every 7,000 to 20,000 pregnancies, making it a rare but clinically significant condition.⁶

Historically, associated maternal mortality exceeds 70% and fetal mortality 85%. However, early diagnosis and timely termination of pregnancy have significantly reduced these figures, reaching approximately 7–12% for the mother and 9–15% for the fetus in recent international reports.⁹

Several studies have shown that AFLP shares clinical and laboratory characteristics with multiple entities, making its recognition difficult. These include HELLP syndrome, intrahepatic cholestasis, viral hepatitis, autoimmune hepatitis, and certain inherited metabolic disorders, in addition to less frequent differential diagnoses such as renal or gallbladder tumors.¹⁵ This overlap explains why it is considered a diagnostic challenge, especially in contexts where resources

are limited and specialized tests are not immediately available.¹⁷

In Latin America, the available evidence is limited to case reports and small series, reflecting epidemiological underreporting and a gap in the development of clinical guidelines adapted to the region. In Mexico, reports are scarce and come mainly from tertiary hospitals, where most patients arrive with advanced disease and associated complications, increasing morbidity and mortality.

The development of clinical criteria such as the Swansea criteria, which integrate clinical, laboratory, and imaging findings, has improved diagnosis in the absence of liver biopsy. However, even these criteria have limitations when applied in hospital settings with limited infrastructure, reinforcing the need for literature reviews that integrate international evidence with local experiences to guide clinical practice.

THEORETICAL FRAMEWORK

Clinical relevance of Acute Fatty Liver of Pregnancy

The clinical relevance of acute fatty liver of pregnancy (AFLP) lies in its low frequency as an obstetric complication, but one that is potentially fatal and considered a medical emergency. Its global incidence is estimated to be between 1 in 7,000 and 1 in 20,000 pregnancies. Despite this low frequency, its clinical impact is significant, as it can rapidly progress to hepatic and renal failure and coagulopathy.

Internationally, geographical variations in the prevalence and severity of cases have been described. In Europe, the incidence is estimated at 1 in 8,000 pregnancies, while in Asia the frequency may be higher due to LCHAD enzyme deficiency, which is associated with a worse prognosis.^{4,17} In Latin America, evidence is limited to case reports and small series, reflecting epidemiological underreporting. In Mexico, reported cases come mainly from tertiary hospitals, indicating late diagnosis and a high risk of complications in general hospitals with limited resources.

The most widely accepted pathophysiological mechanism involves a deficiency in mitochondrial β -oxidation of long-chain fatty acids, particularly due to fetal mutations in the LCHAD enzyme. This leads to the accumulation of toxic metabolites in the maternal liver and diffuse microsteatosis, with manifestations of hypoglycemia, jaundice, hyperbilirubinemia, and, in severe cases, multiple organ failure.^{9,17}

Pregnancy is physiologically associated with progressive hyperlipidemia, mediated by counterregulatory hormones and changes in insulin resistance. However, when these increases exceed physiological ranges, they become risk factors for complications. The monograph in the Argentine Journal of Endocrinology and Metabolism shows that excessive hypertriglyceridemia and decreased HDL increase the risk of preeclampsia, gestational diabetes, and preterm

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birth, in addition to promoting atherogenic lipid profiles in both the mother and offspring.^{1,2}

Additionally, a systematic review published in the Journal of Negative and No Positive Results confirms that elevated levels of total cholesterol, LDL and triglycerides during pregnancy are associated with a higher risk of preeclampsia and gestational diabetes mellitus, while high pre-pregnancy BMI and excessive weight gain enhance hyperlipidemia and its vascular complications.²

These findings support the idea that congenital or acquired dyslipidemias can mimic or worsen AFLP, complicating differential diagnosis in clinical settings, and it is precisely the lipid levels that remain elevated from the beginning and at the date of the last assessment.

Intrahepatic cholestasis of pregnancy (ICP) is the most common specific liver disorder of pregnancy. It is characterized by nocturnal palmar-plantar pruritus and elevated bile acids, with a significant risk of fetal morbidity and mortality, including intrauterine distress and preterm delivery. Unlike acute gastroenteritis, ICP is not accompanied by hypoglycemia or multiple organ failure, although clinically it can be confused with it due to the presence of jaundice and abnormal liver function tests. In Mexico, the lack of routine availability of bile acid testing limits diagnostic capacity, forcing the use of clinical suspicion as the primary tool.

The nonspecific nature of the symptoms (nausea, vomiting, abdominal pain, jaundice) and their similarity to other liver diseases of pregnancy make the application of diagnostic algorithms essential. The Swansea criteria, which require six or more clinical and laboratory findings (hypoglycemia, coagulopathy, hyperbilirubinemia, leukocytosis, elevated creatinine, among others), are one of the most useful tools for standardizing the diagnosis, especially in contexts where advanced studies are not available.^{15, 7}

The main barrier to timely diagnosis in general hospitals is the lack of specialized tests (bile acids, genetic studies, magnetic resonance imaging). Therefore, integrating clinical criteria and basic tests—glucose, AST/ALT, bilirubin, PT/INR, creatinine, ultrasound—constitutes a pragmatic strategy that allows for timely obstetric decision-making. This approach is fundamental in health systems like Mexico's, where advanced diagnostic resources are not available at all levels of care.¹⁷

Association with autoimmune diseases

Acute fatty liver of pregnancy (AFLP) shares multiple biochemical and clinical manifestations with other liver diseases, particularly autoimmune diseases. In the case presented, the radiological findings suggested a probable autoimmune disease, reflecting the diagnostic challenge in these scenarios. Among the entities to consider are systemic lupus erythematosus (SLE) and autoimmune hepatitis (AIH), both of which can present during pregnancy with abnormal

liver function tests, jaundice, and nonspecific systemic symptoms.^{7,17}

Autoimmune markers and diagnostic confusion

During pregnancy, the detection of autoantibodies such as ANA, anti-DNA, SMA, or anti-LKM1 may point toward a diagnosis of autoimmune hepatitis (AIH) or active lupus. However, in the context of acute gestational hypertension (AGE), these findings can be misleading.

•Making: Elevated transaminases, jaundice, and coagulopathy can be mistaken for an autoimmune hepatic flare, especially if autoantibodies are identified without a prior clinical correlation. In the case presented, this confusion became evident, as the patient exhibited clinical and analytical data compatible with both entities.

•Aggravation: In women with an underlying autoimmune disease, the inflammatory and immunological state of pregnancy can exacerbate liver dysfunction, resulting in a more severe condition than isolated AFLP.

A population-based study in Canada, with more than 1.7 million births, demonstrated that obstetric complications such as preeclampsia, spontaneous preterm birth, and severe fetal growth restriction are associated with an increased risk of developing maternal autoimmune diseases in the years following childbirth, with the highest incidence in the first three years.¹³ This evidence supports that inflammatory and autoimmune processes related to pregnancy not only predispose to chronic diseases, but in the context of AFLP they act as aggravating factors, capable of intensifying multi-organ dysfunction and complicating its differential diagnosis. Increased maternal-fetal risk

Patients with SLE have a higher risk of hepatic, renal, and hematological complications during pregnancy. If this is compounded by the development of AFLP, the risk of multiple organ failure increases considerably.⁷ Furthermore, a Canadian population study demonstrated that obstetric complications such as preeclampsia, preterm birth, and fetal growth restriction are associated with an increased risk of developing autoimmune diseases in subsequent years, especially during the first three years after delivery, reinforcing the role of autoimmunity as an aggravating factor in the context of AFLP.¹³

Mexican clinical evidence

A case series published at the “Agustín O’Horán” General Hospital (Autonomous University of Yucatán) underscores that the differential diagnosis of AFLP should include HELLP syndrome, intrahepatic cholestasis, viral and autoimmune hepatitis, since the overlap of clinical and laboratory findings can delay timely obstetric delivery. This delay translates into higher maternal and fetal morbidity and mortality, emphasizing the need to apply standardized diagnostic tools such as the Swansea criteria and correlate them with autoimmune serology and the clinical context of each patient.¹⁰

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Relationship with systemic lupus erythematosus or other autoimmune diseases.

Systemic lupus erythematosus (SLE) and autoimmune hepatitis can present during pregnancy with liver abnormalities similar to autoimmune hepatitis, including elevated transaminases, jaundice, and coagulopathy. These conditions should be considered, especially in patients with a history of autoimmune disorders, since pregnancy can exacerbate immune activity.⁷ The presence of specific antibodies (ANA, anti-DNA, anti-LKM1) and the clinical course after delivery can help differentiate between them.

How can autoimmune markers mimic or exacerbate liver dysfunction in pregnancy?

• In pregnancy, liver dysfunction can be due to pregnancy-specific conditions (e.g., AFLP, HELLP syndrome) or to liver diseases unrelated to pregnancy, including autoimmune hepatitis and other autoimmune diseases. Therefore, the presence of autoantibodies (ANA, ASMA, anti-LKM1, etc.) can bias clinical judgment toward an autoimmune flare and delay the recognition of an AFLP, which is an obstetric emergency requiring early termination of pregnancy. This distinction is part of the classification and diagnostic approach recommended in clinical guidelines for liver disease in pregnancy.

To avoid this confusion, it is recommended to prioritize the clinical and analytical criteria for AFLP. The Swansea score/criteria are based on laboratory data and signs of multi-organ dysfunction (hypoglycemia, coagulopathy, hyperbilirubinemia, elevated creatinine, etc.) and have proven useful not only for diagnosis but also for estimating maternal-fetal severity and complications. In other words, the presence of autoantibodies alone should not replace a syndromic diagnosis supported by Swansea when the clinical picture is consistent with AFLP; autoantibodies may coexist with or exacerbate the dysfunction, but they do not substitute for the characteristic clinical and biochemical pattern of AFLP.

Association with metabolic disorders

Acute fatty liver of pregnancy (AFLP) is closely related to various metabolic alterations, particularly those linked to lipid metabolism and mitochondrial oxidation of fatty acids, which can act as both predisposing factors and elements of diagnostic confusion.

Congenital and acquired dyslipidemias

Pregnancy is physiologically associated with a progressive increase in serum lipids, reaching increases of up to 200–300% in triglycerides during the third trimester. However, when this hyperlipidemia is supraphysiological or is superimposed on congenital dyslipidemia, it can mimic or exacerbate the AFLP. Patients with these conditions present with markedly elevated triglycerides, secondary hypoglycemia, and abnormal liver function tests, making it difficult to distinguish between primary dyslipidemia and true AFLP.⁷

Recent literature emphasizes that these alterations are not harmless. An Argentinian review reports that excessive increases in cholesterol and triglycerides are associated with a higher risk of preeclampsia, gestational diabetes, and preterm birth, in addition to an atherogenic lipid profile in both the mother and offspring.¹ Similarly, a systematic review in Europe found that elevated levels of total cholesterol, LDL, and triglycerides during pregnancy are related to a higher risk of metabolic and vascular complications, especially in overweight or excessively weight-gained women.² These findings confirm that gestational dyslipidemia constitutes a metabolic complication and a factor in diagnostic confusion in high-risk pregnancies. Alterations in mitochondrial beta-oxidation

The most widely accepted pathophysiological mechanism for AFLP is an inherited deficiency in the mitochondrial beta-oxidation of long-chain fatty acids, particularly a deficiency of the enzyme LCHAD (long-chain 3-hydroxyacyl-CoA dehydrogenase). Fetal transmission of this mutation results in a partial or total inability to oxidize fatty acids, causing the accumulation of toxic metabolites and lipid overload in the maternal liver.^{4,9}

This metabolic defect explains why AFLP most frequently manifests in the third trimester, a stage in which fetal energy demand is at its peak and the mother receives an excess of unmetabolized fatty acids. Clinical outcomes include diffuse hepatic microsteatosis, hypoglycemia, hyperbilirubinemia, and, in severe cases, multiple organ failure.¹⁷

The integration of this evidence allows us to affirm that AFLP should not be understood merely as an isolated event, but rather as the result of the interaction between pre-existing metabolic alterations (dyslipidemias) and genetic defects in mitochondrial oxidation, within the context of lipid overload characteristic of pregnancy. Identifying these risk factors, as well as monitoring maternal lipid profiles, can facilitate more timely diagnosis and preventive strategies that reduce maternal and fetal morbidity and mortality.

Clinical presentation and diagnosis

Acute fatty liver of pregnancy often begins with a nonspecific prodromal period, characterized by malaise, nausea, vomiting, epigastric pain, and jaundice, which delays its recognition.^{7,9} From a biochemical standpoint, it is associated with hyperbilirubinemia, hypertransaminasemia, hypoalbuminemia, hypocholesterolemia, hypoglycemia, and coagulation abnormalities, findings that can be confused with other liver diseases of pregnancy such as intrahepatic cholestasis or HELLP syndrome.⁵ Liver biopsy can confirm the diagnosis in atypical cases, although in clinical practice the Swansea criteria are used as the main standardization tool.¹⁷ Despite advances in management, maternal-fetal mortality still remains around 20%, highlighting the importance of early diagnosis and immediate termination of pregnancy as a definitive measure.

Associated tumors as differential diagnoses

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Acute fatty liver of pregnancy (AFLP) not only compromises liver function, but is frequently accompanied by acute renal dysfunction and can mimic abdominal neoplastic conditions (renal or gallbladder tumors), which broadens the spectrum of differential diagnosis.

Associated kidney disease

Pregnancy-related acute kidney injury (PR-AKI) is a common outcome in patients with acute gastric hyperglycemia. The pathophysiological mechanism involves both acute tubular necrosis secondary to hypoperfusion and fatty acid deposition nephropathy, which accompany the state of multiple organ failure.

A recent systematic review estimates that the global incidence of PR-AKI is approximately 2% of pregnancies, with maternal mortality reaching 12.7% and a high burden of neonatal complications.¹⁶ In patients with AFLP, the presence of acute renal failure is correlated with a worse maternal-fetal prognosis and a higher risk of needing intensive care.

Furthermore, it has been documented that women with chronic kidney disease or at risk of renal function decline experience greater reproductive complications, including fetal loss and a worse perinatal outcome. This is relevant in clinical practice, as pre-existing kidney disease can amplify the severity of acute liver failure, increasing the difficulty in distinguishing between primary kidney injury and that secondary to hepatic syndrome.⁸

Renal and gallbladder tumors as differential diagnoses

Abdominal pain, jaundice, and elevated liver enzymes, also present in AFLP, can also be found in patients with renal or gallbladder tumors. In obstetric practice, these tumors are often diagnosed incidentally during imaging studies ordered for cases of jaundice or persistent abdominal pain.

Although imaging findings in acute fatty liver of pregnancy are often nonspecific, the presence of renal or gallbladder masses can mislead the initial diagnosis, delaying the identification of AFLP. Therefore, it is essential to integrate laboratory findings (hypoglycemia, hyperbilirubinemia, coagulopathy) and the Swansea criteria to differentiate these tumors from acute liver of pregnancy.

Complications of acute fatty liver of pregnancy

Acute fatty liver of pregnancy (AFLP) is a condition with high maternal and fetal morbidity and mortality due to the frequency and severity of its complications. These complications arise from both liver involvement and the development of characteristic multi-organ failure as the disease progresses.

Acute renal failure

Acute kidney injury (AKI) is a frequent complication of acute fatty liver of pregnancy (AFLP), reported in 60% to 97% of cases (Santana et al., 2005). Although usually moderate and reversible, in some patients it progresses to severe kidney failure, contributing to the development of multiple organ failure. Unlike AKI associated with preeclampsia or HELLP syndrome, in AFLP it can occur in the absence of

hypertension, proteinuria, or microangiopathy, which is a relevant differentiating factor. The pathophysiology is not yet fully understood, but it has been linked to the accumulation of toxic non-oxidized metabolites and the systemic involvement characteristic of diffuse hepatic microsteatosis.

In the clinical case described by Santana et al., a pregnant woman at 29 weeks' gestation developed acute renal failure (ARF) with a creatinine level of 3.6 mg/dL, hypoglycemia, jaundice, and disseminated intravascular coagulation (DIC), in the context of multiple organ failure. The diagnosis was confirmed by liver biopsy, which demonstrated vesicular microsteatosis, a pathognomonic finding for AFLP.

Coagulation disorders

Disseminated intravascular coagulation (DIC) is another severe and frequent complication of AFLP, resulting from liver dysfunction and excessive consumption of clotting factors. Clinically, it manifests as obstetric hemorrhage, hematomas, and persistent bleeding after cesarean section or hysterectomy. It is considered a major determinant of maternal mortality.

Fulminant hepatic failure

Liver involvement in AFLP can progress to fulminant acute liver failure, characterized by hepatic encephalopathy, hyperbilirubinemia, severe hypoglycemia, and serious coagulation abnormalities. The rapid progression of this condition necessitates immediate termination of pregnancy and the initiation of intensive life support measures.

Pancreatitis, seizures, and sepsis

Other described complications include acute pancreatitis, non-epileptic seizures secondary to hypoglycemia and sepsis, which increase clinical complexity and raise maternal mortality.

Multiple organ failure and prognosis

In most severe cases, the final outcome is multiple organ failure (MOF), which combines hepatic, renal, hematologic, and respiratory dysfunction. Despite diagnostic and therapeutic advances, maternal mortality can reach up to 20%, while fetal mortality can be even higher.^{11,17}

Justification

Acute fatty liver of pregnancy (AFLP) is one of the most serious and high-risk liver diseases encountered in obstetric practice. Despite its low incidence (1 in 10,000–20,000 pregnancies), it poses a significant threat to maternal and fetal life, with reported maternal mortality rates as high as 20% and even higher rates in the fetus.^{11,17}

The main difficulty lies in its timely diagnosis, since the clinical picture usually begins with nonspecific symptoms (nausea, vomiting, abdominal pain, general malaise) that can be confused with more common pregnancy pathologies, such as preeclampsia, HELLP syndrome, or intrahepatic cholestasis. This clinical and biochemical overlap leads to delays in identifying the disease and, consequently, to an increase in maternal and fetal morbidity and mortality.

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Additionally, current literature demonstrates that AFLP should not be understood as an isolated event, but rather as the result of a complex interaction between metabolic factors (gestational dyslipidemia, defects in mitochondrial β -oxidation of fatty acids), immunological factors (autoimmunity and inflammatory states), and obstetric factors (preeclampsia, preterm delivery). Recognizing these elements allows for a better understanding of the pathophysiology and the establishment of a comprehensive approach to differential diagnosis.

The relevance of this work lies in its provision of an updated academic analysis that integrates both international evidence and regional and national reports, allowing the disease to be contextualized in different clinical settings. It also highlights the need for healthcare professionals to have clear diagnostic criteria (Swansea criteria) and support tools to differentiate AFLP from other conditions with which it is often confused. In this sense, the present study seeks to highlight the importance of early diagnosis and multidisciplinary management, with the aim of reducing maternal-fetal morbidity and mortality and generating evidence that contributes to clinical practice and academic training in maternal-fetal medicine.

General Objective

To analyze acute fatty liver of pregnancy and link it to other pathologies that simulate a similar clinical picture, through bibliographic review and case report, in order to identify diagnostic patterns that allow anticipating complications in resource-limited environments, and thus generate applicable inter-institutional guidelines through a clinical algorithm and scientific evidence intended for publication in 2025.

Specific objectives

1. Review the scientific literature published between 2000 and 2025 on AFLP, its complications and most frequent differential diagnoses, in a period of six months.
2. Describe a clinical case of AFLP and compare it with pathologies that simulate the same picture (preeclampsia, HELLP, cholestasis, autoimmune hepatitis, renal and gallbladder tumors), in order to establish a differential diagnostic pattern.
3. Design a clinical algorithm applicable in resource-limited settings, based on reviewed scientific evidence and case analysis, to guide professionals in early diagnosis and management.
4. Generate public scientific evidence and propose inter-institutional guidelines that strengthen obstetric practice.

Clinical case presentation

This is a 21-year-old female patient, originally from and residing in Cancún, Quintana Roo. She has a university education, lives in a common-law relationship, practices the Christian faith, and has blood type O Rh positive. From an obstetric standpoint, she is a primigravida, currently in her third trimester of a singleton pregnancy, apparently

progressing normally, with a male fetus. She reported adequate prenatal care, with eight documented visits. She denied any history of chronic illnesses, drug allergies, or regular medication use.

Regarding family history, he denied chronic degenerative diseases, heart disease, or immunological or endocrinological disorders. His non-pathological history included an incomplete vaccination schedule, a semi-sedentary lifestyle, and adequate nutrition, all within the context of urban housing with basic services; he denied any history of substance abuse.

The patient presented to the emergency department with a 31.3-week pregnancy, as determined by a second-trimester transplotted ultrasound. She reported generalized pruritus and lower back pain of three days' duration, as well as 24 hours' jaundice. Vital signs were within normal limits. Laboratory tests performed outside the home showed elevated transaminases, hyperbilirubinemia, and leukocytosis, leading to an initial suspicion of intrahepatic cholestasis of pregnancy. Hospitalization was decided upon, and treatment was initiated with ursodeoxycholic acid 500 mg orally every 8 hours, along with a lung maturation regimen of betamethasone 12 mg intramuscularly every 24 hours for two doses. Close monitoring of the mother and fetus was maintained, and both remained stable throughout.

On the second day of hospitalization, she presented with generalized pruritus, scleral and cutaneous jaundice, nausea, vomiting on one occasion, and nonspecific abdominal pain predominantly in the mesogastric and hypogastric regions. Laboratory results confirmed mixed dyslipidemia, moderate elevation of transaminases, elevated alkaline phosphatase, hyperbilirubinemia primarily due to elevated direct bilirubin, and leukocytosis. Differential diagnoses considered included acute fatty liver of pregnancy, non-alcoholic steatohepatitis, and viral hepatitis. During her stay in the Gynecology and Obstetrics ward, an Internal Medicine consultation was requested, and they ordered viral panels for hepatitis B and C, both of which were negative. Despite the established treatment, an increase in transaminase levels was observed without significant clinical improvement, so omega-3 fatty acids and cholestyramine were added.

The presence of icteric serum and laboratory results showing a persistent cholestatic pattern, mild hepatocytolysis, and no evidence of severe liver dysfunction or glucose abnormalities were reported. Given the lack of available imaging studies in the unit and the undiagnosed liver disease, a consultation with the Intensive Care Unit (ICU) was requested. Since no evidence of organ failure or maternal-fetal compromise was found, it was suggested that management continue pending imaging studies to determine the intra- or extrahepatic etiology of the obstructive pattern.

The patient remained under treatment for suspected intrahepatic cholestasis of pregnancy and mixed dyslipidemia, with close fetal monitoring. Subsequently, a

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liver and biliary tract ultrasound was performed, which revealed diffuse increased echogenicity, hepatomegaly, gallstones without signs of exacerbation, an echogenic common bile duct of undetermined etiology, and bilateral obstructive uropathy, predominantly on the left. The obstetric ultrasound showed a pregnancy with a single live intrauterine fetus of 31.5 weeks, in cephalic presentation, with a grade II posterior placenta of maturity and an amniotic fluid index of 113 mm.

Subsequent laboratory tests revealed a quadrupling of transaminase levels, increased cholesterol and triglycerides despite treatment, rising uric acid, hypoglycemia, and persistent leukocytosis. Upon meeting five Swansea criteria, a high suspicion of acute fatty liver of pregnancy was established. Fetal neuroprotection with magnesium sulfate was initiated, and the patient was referred to the obstetrics ward for close monitoring and management reassessment.

It was decided to terminate the pregnancy via cesarean section for the benefit of both mother and fetus, given the imminent risk of acute liver failure. During the procedure, meconium-stained amniotic fluid was observed. A male newborn was delivered, weighing 1780 g, measuring 43 cm in length, with Apgar scores of 8/9 and a Capurro score of 33 weeks. He was admitted to the growth and development unit due to low birth weight and prematurity.

Following the cesarean section, the patient remained hemodynamically stable, with a satisfactory postpartum recovery. However, she was reassessed by the Intensive Care Unit due to persistent biochemical abnormalities indicative of acute liver disease.

During his stay in the ICU, renal dysfunction was added, with elevated creatinine (1.2 mg/dl), severe hypoglycemia (up to 48 mg/dl), elevated fibrinogen, persistent leukocytosis, elevated transaminases, hyperbilirubinemia, hypercholesterolemia, and hypertriglyceridemia.

A repeat hepatic and biliary tract ultrasound showed hepatomegaly, a thin-walled gallbladder, and an adjacent 15×10 mm image without acoustic shadowing, suggestive of a hydrocholecyst with a possible polyp versus a stone. Additional findings included polycystic kidneys: the right kidney with a 20×15 mm cyst; the left kidney with loss of morphology, multiple cysts in the parenchyma and renal pelvis, the largest measuring 120×53×68 mm, parenchymal thinning to 10 mm, and decreased corticomedullary differentiation, as well as pyelocaliceal dilation, without evidence of stones.

Management for intrahepatic cholestasis and mixed dyslipidemia was continued. The Surgery service evaluated the patient for gallstones, concluding that, since no signs of exacerbation were found, she could continue the protocol on an outpatient basis after discharge.

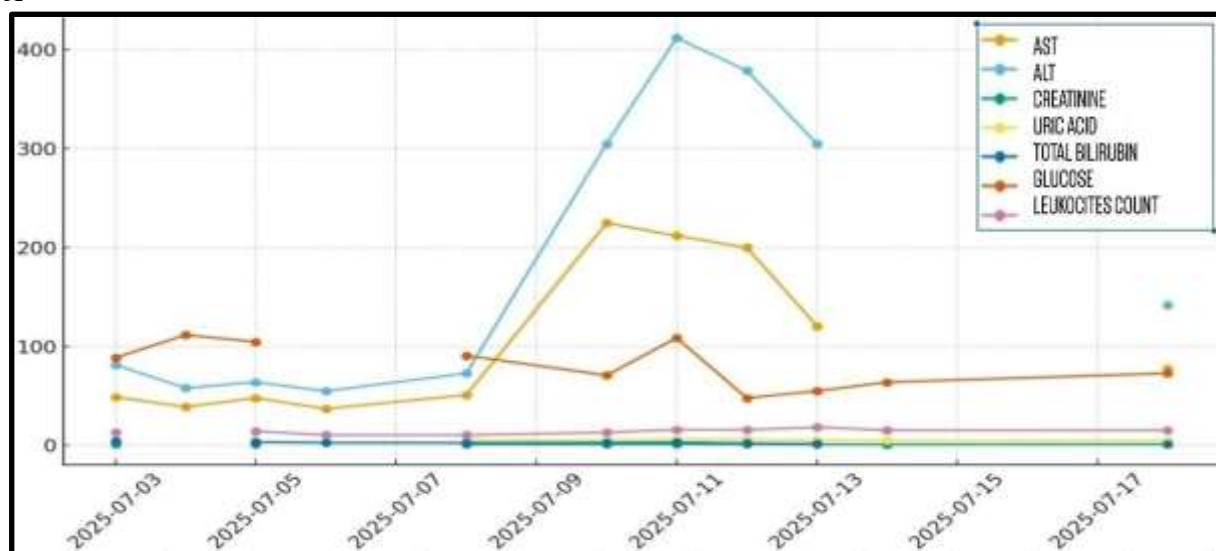
Given the renal findings, a computed axial tomography (CAT) scan and evaluation by Urology were requested; however, the patient requested voluntary discharge before obtaining results.

One week later, she returned for suture removal. Follow-up laboratory tests showed persistent leukocytosis, hyperbilirubinemia, hypercholesterolemia, and hypertriglyceridemia, although these were trending downward, along with a decrease in jaundice and other symptoms. A contrast-enhanced abdominal CT scan revealed a pulmonary pattern suggestive of autoimmune disease, right polycystic kidney disease, left extrarenal pelvis, hepatomegaly, and gallstones.

During hospitalization, serial monitoring of biochemical and hematological parameters was performed with the aim of assessing the progression of liver damage.

Evolution of laboratory parameters (July 2025), with elevated transaminases and bilirubin upon admission, persistent leukocytosis, and an episode of critical hypoglycemia, in the context of acute liver damage. (Own elaboration.)

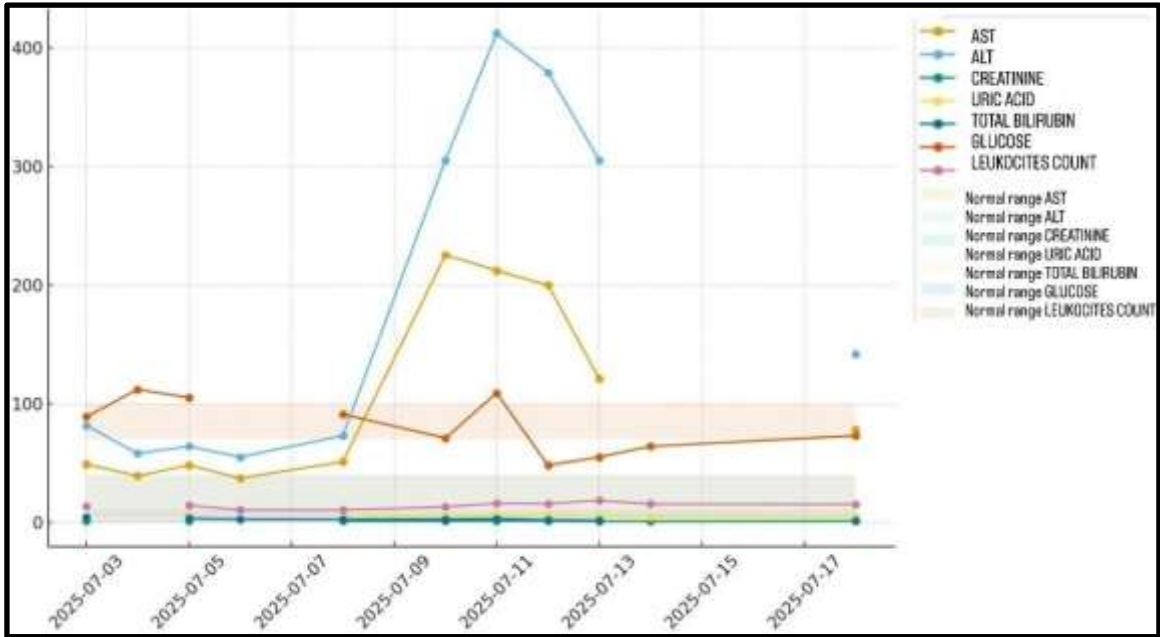
Graph A



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Graph A shows the evolution of transaminases, total bilirubin, creatinine, glucose, uric acid and leukocytes between July 3 and 17, 2025. Showing a pattern of marked elevation of transaminases and bilirubin on admission, persistent leukocytosis and an episode of critical hypoglycemia, compatible with a picture of acute liver damage.

Graph B



Graph B shows the evolution of biochemical and hematological parameters compared to reference ranges. A pattern of acute hepatocellular damage is observed, with marked peaks in transaminases (AST/ALT) and elevated bilirubin upon admission, which gradually decreased throughout the follow-up period. A critical hypoglycemic episode on July 12th stands out, accompanied by persistent leukocytosis, indicative of a sustained inflammatory state. Creatinine remained within normal ranges, ruling out significant renal involvement.

ETHICAL CONSIDERATIONS

The patient's consent was obtained for the procedures described in this case. The ethical principles of the Declaration of Helsinki were followed, and the General Health Law was complied with, taking the necessary measures to protect the patient's identity by removing any identifying details.

Discussion and justification of the diagnosis

Acute fatty liver of pregnancy presents a diagnostic challenge in obstetrics, as it shares clinical and biochemical manifestations with other liver and obstetric conditions. In resource-limited settings, this overlap can delay identification

and timely intervention, increasing maternal and fetal morbidity and mortality.

The main differential diagnoses include HELLP syndrome, preeclampsia with liver involvement, intrahepatic cholestasis of pregnancy, acute viral hepatitis, autoimmune hepatitis, systemic lupus erythematosus with liver involvement, thrombosis of the hepatic veins (Budd-Chiari syndrome) and, occasionally, extrahepatic pathologies such as cholecystitis or gallstones.

To facilitate clinical interpretation, the following comparative table is presented, summarizing the typical onset times, dominant clinical features, laboratory findings, imaging studies, and differentiating factors for each entity:

Table 1. Clinical, laboratory and imaging characteristics for the differential diagnosis of liver diseases in pregnancy.

Entity	Typical moment	Dominant clinic	Key laboratory	Image	Keys to differentiating
AFLP	T3 or postpartum (may include 2nd trimester)	Nausea, vomiting, abdominal pain, jaundice; rapid progression	Hypoglycemia, ↑ bilirubin, ↑ AST/ALT (moderate), coagulopathy (↑ PT), ↑ creatinine, leukocytosis; ≥6 Swansea criteria	US: hypo/hyperechoic liver, mild ascites; MRI safe in pregnancy; CT only if	Obstetric emergency; suspect if hypoglycemia + prolonged PT + acute renal failure; terminate pregnancy prematurely.

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				absolutely necessary	
HELLP/Hepatic PE	T3	Hypertension, headache, epigastric pain	Thrombocytopenia, hemolysis (↑ LDH, schistocytes), ↑ AST/ALT (usually higher than in AFLP), proteinuria	US: sometimes subcapsular hematoma; MRI if complications	Marked hypoglycemia and hyperbilirubinemia are less typical than in AFLP.
Intrahepatic cholestasis of pregnancy (ICP)	T2–T3	Pruritus (palms/soles), mild jaundice	Bile acids↑, mild bilirubin, moderate AST/ALT	normal biliary ultrasound	Pruritus + elevated bile acids suggest ICD; without hypoglycemia or severe coagulopathy.
Acute viral hepatitis	Any	Jaundice, malaise, fever	Very high transaminases (>> 10×), bilirubin↑; positive serologies	Non-specific US	AST/ALT much higher than in AFLP; no typical hypoglycemia.
Autoimmune hepatitis / SLE with liver involvement	Previous or first pregnancy	Jaundice, arthralgia, systemic symptoms	ANA/ASMA/anti-LKM1+, hypergammaglobulinemia; high AST/ALT, variable PT	Sometimes an inflammatory pattern	Autoantibodies can be confusing; if the condition is fulminant with hypoglycemia/TP↑, prioritize AFLP + Swansea and terminate the pregnancy.
Budd-Chiari / hepatic venous thrombosis	Anyone (hypercoagulable risk)	Right upper quadrant pain, ascites, hepatomegaly	AST/ALT↑, variable bilirubin; prothrombotic state	Venous Doppler: altered flow	Decisive Doppler; antithrombotic/specialized management.
Cholecystitis /lithiasis	Any	Colicky right upper quadrant pain, fever	Leukocytosis, slightly altered liver function tests	US: calculi, wall thickening	Colicky pain + positive US; PFH without AFLP pattern.

Source: Prepared by the author based on a literature review.

Table 1 shows that:

1. Marked hypoglycemia and prolonged PT are key to suspecting AFLP versus other entities.
2. In HELLP syndrome, thrombocytopenia and hemolysis differentiate it from pure AFLP.
3. Intrahepatic cholestasis is primarily guided by pruritus and an isolated increase in bile acids.
4. In viral hepatitis, transaminases reach much higher values than in AFLP.

5. The presence of autoantibodies in lupus or autoimmune hepatitis can be misleading, but the pattern of hypoglycemia and coagulopathy in AFLP helps to distinguish it.
6. Finally, pathologies such as cholecystitis, lithiasis or renal/gallbladder tumors should be considered when imaging studies reveal focal lesions or stones, absent in the AFLP. This comparative approach reinforces the need to use standardized clinical criteria such as those from Swansea, together with a multidisciplinary assessment, to shorten the diagnostic time and ensure early termination of pregnancy,

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the only definitive measure to improve the maternal-fetal prognosis.

Based on the bibliographic synthesis and case analysis, a diagnostic algorithm was designed (Table 1) that orders the

most relevant clinical and laboratory actions for the early identification of AFLP

Table 1. Diagnostic algorithm for acute fatty liver of pregnancy (AFLP)

Algorithm stage	Diagnostic action	Clinical keys	Utility	References
1. Initial suspicion	Identify pregnant women in their third trimester/postpartum period with jaundice, abdominal pain, vomiting, and malaise	Nonspecific symptoms, rapid progression	First clinical filter, activates protocol	Lim et al., 2021
2. Basic laboratories	Glucose, AST/ALT, bilirubin, PT/INR, creatinine, CBC, uric acid	Hypoglycemia, bilirubin ↑, moderate AST/ALT ↑, prolonged PT, creatinine ↑	Guides towards AFLP versus HELLP or viral hepatitis	Jouedi et al., 2020
3. Swansea Criteria	Apply ≥6 clinical-analytical criteria	Hypoglycemia, leukocytosis ↑, bilirubin ↑, AST/ALT, PT ↑, creatinine ↑, encephalopathy, ascites/US	Standardizes diagnosis, avoids delays	Tan & Hou, 2021
4. Differential exclusions	Blood pressure, proteinuria, bile acids, viral serologies, autoantibodies, liver Doppler	Hypertension, thrombocytopenia, pruritus, very high transaminases, positive antibodies	Differentiate between HELLP, viral hepatitis C, autoimmunity, and Budd-Chiari	Lim et al., 2021
5. Image	Hepatobiliary ultrasound; MRI is safe; CT scan only if absolutely necessary	US: shiny liver, ascites	Rule out tumors or blockages	Lim et al., 2021
6. Prognostic stratification	Evaluate PT, creatinine, encephalopathy	prolonged PT, ↑ creatinine, encephalopathy, thrombocytopenia	Define level of support and ICU need	Meng et al., 2021
7. Obstetric decision	Early termination of pregnancy	Caesarean section	Central therapeutic measure	Yemdu et al., 2023
8. Limited resources	Use only capillary glucose, AST/ALT, bilirubin, PT/INR, creatinine + basic ultrasound	If ≥6 Swansea criteria + organ failure => manage as AFLP	It guarantees timely diagnosis even without advanced studies	Tan & Hou, 2021

Source: Prepared by the author based on bibliographic references.

In addition, an analysis of the limitations inherent in resource-constrained environments was integrated, along with pragmatic strategies to overcome these barriers (Table 2).

Both proposals aim to serve as a basis for future inter-institutional guidelines that will standardize the approach to AFLP in Mexico

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Table 2. Limitations in resource-constrained environments and pragmatic strategies

Limitation	Clinical impact	Pragmatic solution	References
Lack of specialized tests	Delay in ruling out ICD, viral hepatitis, or autoimmunity	Presumptive diagnosis with Swansea criteria + basic panel (glucose, AST/ALT, bilirubin, PT/INR, creatinine)	Tan & Hou, 2021; Lim et al., 2021
Limited access to advanced imaging (MRI, Doppler, CT)	Difficulty in differentiating tumors, Budd-Chiari syndrome, or hemorrhagic complications	Ultrasound as first line of treatment; CT scan only in severe complications	Lim et al., 2021
Delay in laboratory results (PT, creatinine)	Delay in risk stratification and transfer	Frequent clinical monitoring + capillary glucose; prioritize PT/INR and creatinine in basic laboratory tests	Meng et al., 2021
Shortage of ICU beds and hemodialysis	Higher maternal mortality due to multiple organ failure	Use PT and INR to prioritize early transfer to a center with an ICU	Jouedi et al., 2020
Diagnostic confusion with HELLP, viral hepatitis, or autoimmunity	Delay in obstetric delivery	Simplified algorithms (Swansea + basic); do not delay cesarean section if compatible with AFLP	Yemde et al., 2023

Source: Own elaboration.

Table 2 shows the main limitations in resource-constrained settings for the diagnosis and management of acute fatty liver of pregnancy, its clinical impact, and the pragmatic strategies proposed in the literature to optimize decision-making.

INTERVENTION PROPOSAL

Acute fatty liver of pregnancy (AFLP/AFF) is a rapidly progressing condition with maternal and fetal mortality rates as high as 20%. One of the main challenges in its management is the clinical and biochemical overlap with other obstetric and hepatic pathologies such as HELLP syndrome, intrahepatic cholestasis, viral hepatitis, and autoimmune diseases. In this context, having a standardized diagnostic algorithm becomes essential to reduce delays in identifying the disease and to facilitate therapeutic decision-making.

The proposed algorithm is built from the synthesis of international literature and the analysis of reported cases, organizing the process in sequential stages that include: initial clinical suspicion, the use of basic laboratories available in most hospitals, the application of Swansea criteria, the systematic exclusion of differential diagnoses, the rational use of imaging, prognostic stratification and, finally, the obstetric decision as a definitive measure.

In addition, the limitations of resource-constrained environments, such as those found in many hospitals in Latin America, were considered, proposing pragmatic strategies that allow diagnostic accuracy to be maintained even in the absence of specialized tests or advanced infrastructure.

Thus, this algorithm not only seeks to serve as a clinical support tool, but also as the basis for future inter-institutional guidelines, with an impact on obstetric practice and on the reduction of maternal-fetal morbidity and mortality associated with AFLP.

LIMITATIONS IN THE RESOURCE-CONSTRAINED ENVIRONMENT

In resource-limited hospital settings, the management of serious conditions such as acute fatty liver of pregnancy (AFLP) faces diagnostic and therapeutic barriers that directly impact maternal and fetal outcomes. The lack of specialized tests, restricted access to advanced imaging studies, delays in laboratory results, and a shortage of intensive care units are frequent limitations in clinical practice. These deficiencies not only delay diagnostic confirmation and risk stratification but also increase mortality by hindering timely decision-making in critical situations.

Given this scenario, it is essential to develop pragmatic strategies to mitigate the limitations of the context and optimize available resources. Table 2 summarizes these limitations, their clinical impact, and applicable solutions in restricted scenarios, supported by recent scientific literature. The objective is to offer a realistic operational framework to guide the medical team in the early identification and prioritization of interventions, and the improvement of clinical outcomes.

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Implementing strategies adapted to the resource-limited hospital setting improves the detection and timely management of acute fatty liver of pregnancy, reducing the associated risks of maternal and perinatal morbidity and mortality. This work not only aims to optimize clinical practice through innovation and protocol adaptation, but also to provide educational opportunities for healthcare professionals.

GENERAL CONCLUSION

Managing acute fatty liver of pregnancy in resource-limited hospital settings presents a significant clinical and organizational challenge. The lack of specialized infrastructure, the difficulty in accessing advanced diagnostic studies, and the need for timely decisions in critical situations make the design of innovative, feasible, and evidence-based strategies essential.

This study demonstrates that, through the integration of simplified protocols, ongoing staff training, and the optimization of available resources, it is possible to reduce risks and improve maternal and perinatal outcomes. It also underscores the importance of applied research as a driver of transformation in clinical practice.

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