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Maternal-Fetal Complications of Pregnancy Complicated by Cirrhosis at the Kara University Hospital Center (CHU Kara)

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Abstract

Introduction: the occurrence of pregnancy in a woman with cirrhosis represents a major medical challenge, owing both to the potential complications and to the often limited access to specialized care within the African context. **Objective:** to describe the various maternal and fetal complications, as well as the avenues for improving the management of cirrhosis during pregnancy. **Method:** a case series of pregnancies complicated by cirrhosis was conducted at the Kara University Hospital Centre (CHU Kara) over a three-year period (January 2022-December 2024). **Results:** twenty cases of singleton pregnancies complicated by cirrhosis were recorded. The mean age of the pregnant women was 29.9 years, ranging from 22 to 44 years. Among them, 15 were multigravid and 16 were multiparous. One pregnant woman had pre-existing hypertension, and 11 had a history of untreated hepatitis B infection. Twelve women had a gestational age between 15 and 28 weeks of amenorrhea (WA). The functional symptoms observed included asthenia and pallor (60%), as well as abdominal pain (50%). Ascites was present in all patients (100%), clinical anemia in 70%, and splenomegaly in 40%. Elevated liver enzymes were observed in all pregnant women (100%), while anemia was noted in 80%, hypoglycemia in 70%, and hyperkaliemia in 60%. The main etiology of cirrhosis was hepatitis B (80%). The various maternal-fetal complications included ascitic decompensation (100%), hepatic encephalopathy (40%), renal failure (45%), hepatocellular carcinoma (30%), and prematurity (20%). Management was symptomatic and focused on treating complications, with medical termination of pregnancy performed in eight patients. There were 12 cases of ma-

ternal death and six stillbirths. **Conclusion:** the management of cirrhosis during pregnancy remains a major challenge in our country, which has a high prevalence of hepatitis B, resulting in delayed diagnosis and catastrophic maternal-fetal complications. This underscores the importance of prevention, as well as the early diagnosis and treatment of chronic liver diseases.

Keywords

Pregnancy and Cirrhosis, Complications, Hepatitis B, Kara University Hospital Centre

1. Introduction

Liver cirrhosis, the advanced stage of numerous chronic liver diseases, constitutes a major public health concern worldwide, particularly in sub-Saharan Africa, where chronic viral infections such as hepatitis B and C are endemic. The occurrence of pregnancy in a woman with cirrhosis represents a significant medical challenge, owing both to the potential maternal and fetal complications and to the often-limited access to specialized care across the African continent.

A study conducted in the United States demonstrated that pregnant women with cirrhosis had a threefold increased risk of developing severe complications, with an overall maternal mortality rate of 10% [1]. Similarly, 25% of pregnancies in women with cirrhosis result in stillbirth, while the rate of prematurity reaches 35% [2].

In Africa, the management of this dual pathology cirrhosis and pregnancy faces several obstacles, including delayed diagnosis, the scarcity of specialized hepatology centres, and the poor integration between obstetric and hepatic care. Nonetheless, early and multidisciplinary management is essential to improving the prognosis of these high-risk pregnancies.

A study conducted in Gabon in 2022 reported a maternal mortality rate of 12% and a neonatal complication rate of 28% among pregnant women with cirrhosis [3].

In Togo, a 2016 study conducted at the Sylvanus Olympio University Hospital Centre (CHU Sylvanus Olympio) in Lomé, examining four cases of pregnancy complicated by cirrhosis, reported maternal complications in 50% of cases, notably gastrointestinal hemorrhages and infections [4].

This challenge raises critical questions: What are the specific risks for both mother and child? How can management protocols be adapted in resource-limited settings? And which strategies could be implemented to enhance monitoring and obstetric outcomes within this unique African context?

This study aims to characterize the spectrum of maternal and fetal complications and to examine the challenges, implications, and potential strategies for improving the management of cirrhosis during pregnancy in Africa.

2. Materials and Methods

Study setting: this study was carried out at the Kara University Hospital Centre (CHU Kara), which serves as the referral centre for the entire northern region of Togo.

Study Design and Period: a retrospective case series was conducted, with data collected over a three-year period from 1 January 2022 to 31 December 2024.

Target population: the study included all medical records of pregnant women diagnosed with cirrhosis who were monitored and admitted to CHU Kara during the study period.

Inclusion criteria: pregnant women with a diagnosis of cirrhosis who received medical follow-up throughout pregnancy until delivery were included. The diagnosis of cirrhosis was established based on a combination of clinical, biological, and morphological criteria. Clinically, features of hepatocellular insufficiency and portal hypertension were considered. Biologically, diagnosis relied on findings such as reduced prothrombin time, hypoalbuminemia, hypogammaglobulinemia, the presence of a beta-gamma block, and thrombocytopenia. Morphological assessment included hepatic dysmorphia, a micronodular liver, and irregular hepatic contours.

Cirrhosis was classified according to severity using the Child-Pugh prognostic score, which incorporates five parameters: hepatic encephalopathy, ascites, total bilirubin, serum albumin, and prothrombin level. Stage A corresponds to compensated cirrhosis, with a score (5-6), with a favorable prognosis. Stage B denotes moderately decompensated cirrhosis, with a score (7-9) and stage C indicates severe cirrhosis score (10-15) with a poor prognosis.

Exclusion criteria: pregnant women with cirrhosis who did not undergo follow-up, as well as those with incomplete or missing medical records, were excluded from the analysis.

Data Sources: patient medical records served as the primary data source.

Data Collection Techniques and Tools

Techniques: systematic review and abstraction of hospital logbooks and individual medical records of pregnant women diagnosed with cirrhosis.

Data Collection Tools: a structured case report form was developed to capture:

- **Sociodemographic data**: age, marital status, occupation.
- **Comorbidities**: alcohol consumption, viral hepatitis, and metabolic syndrome.
- Obstetric **data**: gravidity, parity, and gestational age at presentation.
- **Clinical data**: cirrhosis stage, presence of ascites, and associated complications.
- Laboratory **results (biological data)**: liver function tests, coagulation profile, complete blood count, renal function tests, and relevant serological investigations.
- Maternal **and fetal complications**: including hepatic encephalopathy, hepatocellular carcinoma (HCC), hepatic decompensation, maternal and fetal mor-

tality, preterm birth, and low birth weight. HCC diagnosis was based on clinical evaluation (palpable hepatic mass) and morphological criteria (heterogeneous, macronodular liver observed on abdominal ultrasonography).

Data Analysis: Data were systematically entered and analyzed using Microsoft Word 2011 and Excel 2011. Analyses were primarily descriptive, with outcomes summarized using frequencies, percentages, and displayed in tables and figures for clarity.

Ethical Considerations: All patient data were anonymized to preserve confidentiality, in accordance with ethical standards for retrospective studies.

3. Results

Demographic Data: during the study period, 20 cases of pregnant women with cirrhosis were identified. The mean age of the cohort was 29.9 years, ranging from 22 to 44 years. The majority of patients (16) were under 35 years of age (Table 1), and 14 resided in rural areas.

Table 1. Distribution of pregnant women by age.

Age group (years)	n (Number of cases)
[20 - 30[	8
[30 - 40[	10
[40 - 50[	2
Total	20

Medical history: seven pregnant women had chronic, untreated hepatitis B virus infection, and one had a history of hypertension.

Obstetric characteristics: twelve women presented with a gestational age between 15 and 28 weeks of amenorrhea (WA). The obstetric characteristics of the cohort are summarized in Table 2.

Table 2. Distribution of pregnant women by gestational age, gravidity, and parity.

Gestational age	n (Number of cases)
≤14 SA	03
[15 - 28]	12
[29 - 40]	05
Gravidity	
[1 - 2]	6
[3 - 4]	11
≥5	3
Parity	
0	4
[1 - 2]	7
[3 - 4]	9

Clinical and paraclinical data: on admission, 12 pregnant women presented with asthenia and pallor as their primary symptoms. The distribution of patients according to functional symptoms is presented in Table 3.

Table 3. Distribution of subjects according to functional symptoms upon admission.

Functional Symptoms	n (Number of cases)
Asthenia	12
Pallor (Paleness)	12
Abdominal Pain	10
Headaches	4
Hematemesis/Melena	4
Jaundice (Icterus)	4
Dizziness (Vertigo)	4
Abdominal Distention	2
Epigastric Pain	2
Pelvic Pain	2
Abdominal Dullness	2
Lower Limb Edema	2

All patients (100%) presented with ascites upon physical examination. Clinical anemia was found in 70% (Figure 1).

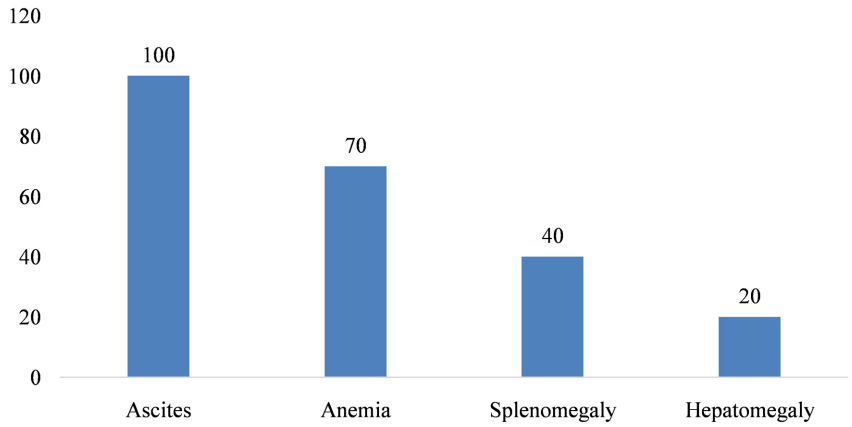

Figure 1. Distribution of subjects according to clinical signs.

All patients (100%) exhibited cytolysis, with transaminase levels exceeding five times the upper limit of normal in eight cases. Elevated gamma-glutamyl transferase (γ-GT) levels were observed in 16 women, and eight presented with acute renal failure. Hypoglycemia was detected in 14 patients, while anemia was noted in 16 cases, nine of which were severe, with hemoglobin levels below 7 g/dL. Among the anemic cases, six were normocytic and normochromic. Thrombocy-

topenia was identified in 12 patients. Electrolyte disturbances were frequent, including hyponatremia in 10 cases and hyperkaliemia in 12 cases. All patients had a reduced prothrombin ratio (PR) below 60%. Morphological assessment revealed splenomegaly in 10 patients (Table 4). Upper gastrointestinal endoscopy, performed in two patients, identified large Grade 3 esophageal varices with red signs in both instances.

Table 4. Distribution of subjects according to radiological signs.

Radiological Sign	n (Number of Cases)
Macronodular Liver	4
Micronodular Liver	16
Hepatomegaly (Liver Enlargement)	5
Splenomegaly (Spleen Enlargement)	10
Ascites	20

Causes of cirrhosis: sixteen pregnant women were chronic carriers of hepatitis B virus (HBV), and regular alcohol consumption was reported in 12 cases.

Maternal and fetal complications: all patients (100%) exhibited edematous-ascitic decompensation (Table 5). Cirrhosis was classified as Child-Pugh B in 10 patients and Child-Pugh C in the remaining 10.

Table 5. Distribution of subjects based on complications.

Complication	n (Number of Cases)
Decompensation (Ascites)	20
Acute Renal Failure (ARF)	9
Hepatic Encephalopathy (HE)	8
Hepatocellular Carcinoma (HCC)	6
Upper Gastrointestinal Bleeding (UGIB)	2
Ascitic Fluid Infection	1
Maternal Death	12

Eight medical terminations of pregnancy (MToP) were performed following multidisciplinary consensus, occurring at 10 weeks of amenorrhea (WA) in two cases and between 20 and 25 WA in six cases. Additionally, six women delivered vaginally, including four preterm and two full-term births, while six pregnancies resulted in stillbirths.

4. Discussion

4.1. Study Limitations

Although limited by its small sample size and retrospective design, this study provides a primary local dataset on a topic that remains under-investigated in Togo.

Some incomplete records were excluded, reflecting constraints inherent to retrospective analyses and suboptimal medical record archiving. Furthermore, the absence of neonatal follow-up data precluded assessment of medium-term outcomes.

4.2. Sociodemographic Data

The mean age of patients with cirrhosis was 29.9 years, ranging from 22 to 44 years. Tchangai *et al.*, in Togo, similarly reported that the majority of cirrhotic women were aged between 25 and 35 years [5]. Likewise, Ndongo *et al.*, in Senegal, observed a high prevalence of cirrhosis among women under 40 years, with a mean age of 31 years, often progressing silently until pregnancy [6]. This predominance of cirrhosis in young and middle-aged women aligns with a well-documented pattern in developing countries, particularly in sub-Saharan Africa, where signs of hepatic decompensation and progression to cirrhosis typically manifest between 20 and 40 years of age. In contrast, in Western countries, the mean age of pregnant women with cirrhosis tends to be higher. For example, Orman *et al.*, in a large US cohort, reported a mean age of 35 years [7]. This discrepancy reflects regional differences in epidemiological dynamics, likely attributable to variations in underlying etiologies. The occurrence of cirrhosis during pregnancy in young women represents a significant public health concern, associated with delayed diagnosis, inadequate screening for chronic viral hepatitis, and the near absence of preconception care. These findings underscore the need to reinforce systematic screening for liver diseases in women of childbearing age, particularly in regions with high viral endemicity, and to ensure long-term follow-up of HBsAg-positive women prior to subsequent pregnancies.

4.3. Place of Residence

The majority of pregnant women with cirrhosis (70%) resided in rural areas, underscoring both delayed diagnosis and limited access to specialized care in these settings. These patients frequently present with more advanced stages of cirrhosis at the time of consultation, owing to restricted access to referral hospitals and a lack of awareness regarding the early manifestations of liver disease [8]. This observation is corroborated by a 2017 study in Senegal by Ndongo *et al.*, which demonstrated a correlation between rural origin and greater clinical severity at admission, particularly with an increased prevalence of ascites and hepatic encephalopathy [6]. The situation is further exacerbated by the insufficiency of qualified personnel and diagnostic resources in peripheral healthcare facilities [9]. Patients managed at tertiary centres benefit from more comprehensive multidisciplinary care, which significantly improves both obstetric and hepatic outcomes [10]. This geographical disparity in healthcare access largely accounts for the poorer maternal and fetal outcomes observed in rural populations, including preterm delivery, medical termination of pregnancy, and elevated mortality rates. Moreover, limited health education and widespread unawareness of hepatitis B and cirrhosis in rural

areas contribute to these diagnostic delays. These findings highlight the urgent need to strengthen community health strategies, particularly through the training of rural healthcare workers in the detection of cirrhosis, alongside the implementation of mandatory viral hepatitis screening during antenatal consultations at primary healthcare facilities.

4.4. Obstetric Data

Fifty percent of the cirrhotic patients were multiparous, with parity ranging from three to four, and presented with a poor prognosis (Child-Pugh Class C). These findings indicate a predominance of cirrhosis among women who have experienced multiple previous pregnancies. Multigravidity has been identified in several studies as a factor that may increase obstetric risk in women with chronic liver disease. According to the literature, women infected with HBV who have undergone several pregnancies are considered at higher risk of progression to cirrhosis due to chronic hormonal fluctuations and repeated immune stimulation during successive gestations [11]. These multiparous cirrhotic patients are also more likely to experience hemorrhagic complications, particularly during labor and delivery, owing to fragile vasculature and altered coagulation parameters [10]. Furthermore, multiparity may delay consultation, especially in rural women who, having previously experienced uncomplicated pregnancies, may underestimate the severity of cirrhosis symptoms. This socio-behavioral factor was highlighted by Balaka *et al.*, who recommended enhanced monitoring of multiparous women with a history of hepatopathy [8].

Overall, these data support the integration of systematic hepatic monitoring into the antenatal care of at-risk multiparous women, particularly in resource-limited settings such as the Kara region. In 70% of cases, cirrhosis was diagnosed during the second trimester. Severe complications-including massive ascites, hepatic encephalopathy, and gastrointestinal bleeding-predominantly arose from 28 weeks of amenorrhea, consistent with Riely *et al.*, who reported that hepatic decompensation most frequently occurs during the third trimester, when hemodynamic load is maximal [12]. Early screening for cirrhosis in pregnant women would substantially improve obstetric and neonatal outcomes, particularly by facilitating multidisciplinary management from the first trimester [13]. Conversely, diagnosis during the third trimester, as observed in 30% of our patients, was associated with frequent obstetric complications, notably prematurity. These findings are consistent with those of Orman *et al.*, who reported a prematurity rate of up to 35% in pregnant women with cirrhosis, predominantly in cases of delayed diagnosis [7].

4.5. Clinical Data

The predominant functional symptoms observed were asthenia (profound fatigue) and pallor, affecting 60% of patients, followed by abdominal pain (50%), headaches, and dizziness. Although these manifestations are not specific to hepatic decompensation, they should prompt clinical vigilance in the context of preg-

nancy. Sarin *et al.*, in India, similarly reported such non-specific signs in the early stages of cirrhosis in pregnant women, particularly asthenia and epigastric pain [14]. Hematemesis and melaena, although less frequent in our series (20%), represent severe indicators of portal hypertension with variceal rupture, constituting both obstetric and hepatological emergencies.

Pallor and headaches are generally attributable to anemia, a common complication of cirrhosis, as confirmed by biological parameters showing anemia in 70% of cases. According to Nguyen *et al.* (2016), these signs must be interpreted within a comprehensive clinical context, as they may mimic other obstetric pathologies, including preeclampsia or hemolytic syndromes [13].

4.6. On Physical Examination

All patients (100%) presented with ascites, which represents the most specific and consistent clinical sign of advanced cirrhosis, a stage where therapeutic options are particularly limited in our setting. Ascitic decompensation constitutes the primary complication of cirrhosis. In the series reported by Runyon et al. (2013), ascites was present in 50% to 85% of cases of decompensated cirrhosis and is considered a marker of poor prognosis [15]. In pregnant women, its detection is often obscured by the physiological increase in abdominal volume, which may be mistaken for uterine enlargement. The presence of ascites in all patients in our series reflects delayed diagnosis in routine clinical practice.

Splenomegaly was observed in 50% of patients, consistent with the pathophysiology of decompensated cirrhosis, in which portal hypertension induces splenic congestion and increased splenic volume. This prevalence is lower than that reported by Sarin *et al.* in India, who observed splenomegaly in 75% of cases [14]. A thorough clinical examination, even within an obstetric context, combined with systematic abdominal ultrasonography, is essential for prompt diagnosis and early detection of complications.

Paraclinically, several biochemical abnormalities were identified in the pregnant cirrhotic patients, reflecting the severity of hepatic involvement and its systemic consequences. Ninety percent of patients exhibited cytolysis, indicative of hepatocellular necrosis. These findings are consistent with those of Nguyen *et al.*, who reported moderate to severe cytolysis in 85% of pregnant women with cirrhosis [13]. All patients (100%) demonstrated a low prothrombin ratio (PR) below 50%. In the series by Terrault *et al.*, a PR below 50% was observed in more than half of the pregnant cohort [11]. A reduced prothrombin ratio is significantly associated with an increased risk of complications, such as gastrointestinal bleeding. This hemorrhagic risk is further compounded by thrombocytopenia, present in 40% of these patients, particularly during the perinatal period.

Morphologically, ultrasonography is an indispensable investigation for the diagnosis of cirrhosis. It confirmed the diagnosis by demonstrating a dysmorphic liver, ascites, and, in some cases, splenomegaly. Ascites is detected by ultrasound in over 80% of cases of decompensated cirrhosis [11], while splenomegaly, a classic indicator of portal hypertension, is reported in 60% to 80% of cases according

to Sarin *et al.* [14]. Abdominal ultrasonography should therefore be performed systematically in the presence of any non-specific signs during pregnancy.

4.7. Etiologies

Seventy percent of cirrhosis cases in pregnant women were attributable to chronic hepatitis B virus (HBV) infection. The predominance of HBV as a cause of cirrhosis in predominantly young pregnant women is well established in sub-Saharan Africa and aligns with trends reported in multiple African studies, in which HBV infection is frequently acquired during childhood, but hepatic decompensation and progression to cirrhosis typically manifest between 20 and 40 years of age [6]. In contrast, in developed countries, the most common etiologies of cirrhosis include alcohol-related liver disease, hepatitis C virus (HCV) infection, and metabolic dysfunction-associated steatohepatitis (MASH) [16]. The high prevalence of mother-to-child transmission of HBV, coupled with delayed screening, accounts for the elevated incidence observed in our setting. Metabolic and autoimmune causes are often underdiagnosed owing to the limited availability of specific diagnostic tests.

4.8. Maternal and Fetal Complications

Several complications of cirrhosis were observed in the pregnant women, most notably hepatic encephalopathy (HE) in 40% of cases. This frequency is somewhat higher than that reported by Sarin *et al.*, who estimated it at approximately 15% - 20% [14], a discrepancy likely attributable to delayed patient management in our setting. Two patients (10%) experienced upper gastrointestinal bleeding (UGIB) due to ruptured esophageal varices secondary to portal hypertension. Upper gastrointestinal endoscopy in these patients revealed large Grade 3 esophageal varices with red signs. However, the lack of routine endoscopic screening constitutes a significant limitation, exacerbated by increased uterine height during pregnancy. In a United States cohort, Orman *et al.* reported a bleeding rate of 30% among pregnant women with cirrhosis [7]. Hepatocellular carcinoma (HCC), the ultimate complication of cirrhosis, was diagnosed in 30% of patients, a prevalence higher than that reported in the literature. Indeed, some studies indicate that HCC is rare during pregnancy, accounting for fewer than 5% of cases [11] [12]. HCC is notably more common in our context of HBV endemicity, where infection likely occurred during the neonatal period, compounded by delayed diagnosis. Spontaneous infection of the ascitic fluid was observed in one patient, representing a frequent and serious complication in decompensated cirrhotic patients. Analysis of ascitic fluid was not routinely performed by the gynecologists and obstetricians. Cirrhosis constitutes a vulnerable physiological state that predisposes patients to various spontaneous infections, including those of the ascitic fluid, urinary tract, lungs, and skin.

We observed an alarming maternal mortality rate of 60%. This high rate is, unfortunately, consistent with several contributing factors, notably delayed diagnosis, limited access to specialized care, and poorly controlled acute complications

that exacerbate prognosis. This rate exceeds that reported by Faye *et al.* in Senegal, who documented a maternal mortality of 30% among pregnant women with cirrhosis, often associated with severe complications [17]. In contrast, Orman *et al.* reported a maternal mortality of 0.45% in the United States, rising to 15% - 20% in cases of decompensated cirrhosis with multiple complications [7]. These figures reflect the benefits of multidisciplinary management in countries with more structured healthcare systems. Recent data indicate that pregnant women with cirrhosis face a 40-fold higher risk of maternal mortality compared with the general obstetric population (0.46% vs 0.01%) [18]. In our study, women who continued their pregnancy into the third trimester predominantly exhibited severe hepatic decompensation, with two maternal deaths recorded. In contrast, patients who underwent early medical termination of pregnancy experienced partial or transient stabilization of their hepatic status, likely attributable to the reduction in hemodynamic and hormonal stress following pregnancy termination. The third trimester represents a particularly critical period for cirrhotic women, with peaks in maternal mortality and hepatic complications [13]. Future studies could assess the potential benefits of early medical termination on maternal health in cirrhotic pregnancies within our context.

Regarding pregnancy outcomes and neonatal status, 40% of pregnancies were medically terminated, 30% resulted in stillbirths, and 20% ended in preterm delivery. These unfavorable outcomes are consistent with the findings of Riely, who reported that fewer than 25% of pregnancies in women with cirrhosis reach term without major complications [12]. Chronic fetal distress is likely attributable to placental hypoperfusion secondary to maternal hepatic decompensation [13]. Close monitoring from the onset of pregnancy is therefore essential to guide and optimize multidisciplinary management.

5. Conclusion

Pregnancy complicated by cirrhosis is associated with numerous severe complications that are challenging to manage in resource-limited settings. Maternal and fetal outcomes are frequently catastrophic. Several factors contribute to this situation, notably the high seroprevalence of hepatitis B virus infection, delayed diagnosis of liver diseases in general and cirrhosis in particular, limited access to specialized hepatology care, and the absence of established management protocols for pregnancies complicated by hepatobiliary disorders. Addressing this critical public health issue requires reinforcing awareness and screening for viral hepatitis, ensuring early management in women of childbearing age, and promoting timely diagnosis and multidisciplinary management of cirrhosis in pregnant women.

Conflicts of Interest

The authors declare that they have no conflict of interest.

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