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Epidemiological, Clinical, Therapeutic, and Prognostic aspects of HELLP Syndrome at the Mother and Child University Hospital center of N'djamena

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Abstract
Introduction: HELLP syndrome is a severe complication of pre-eclampsia. It represents a major obstetric emergency that can be life-threatening for both mother and fetus.
Objective; study its epidemiological, clinical, therapeutic and prognostic aspects of the HELLP syndrome
Patients and Methods: This was a descriptive cross-sectional study covering the period from January,1st 2020 to August, 31st 2024. It concerned the files of patients hospitalized in the gynecology and obstetrics department of N'Djamena Mother and child university hospital. Pregnant patients (term ≥ 20 weeks of gestation) or in the postpartum period with a complete assessment meeting the criteria for the definition of HELLP syndrome.
Data was collected using a survey form containing sociodemographic, clinical, paraclinical, therapeutic and prognostic variables. The analysis was performed using Word and Excel software.
Results: We collected 47 cases amo,g 21,026 patients admitted in the department, giving a frequency of 0.22%. The average age was 24±6.91 years, and the most represented age group was 20-24 years (34.04%). Primigravidas accounted for 38.30%. The diagnosis was often made in antepartum representing 78.72%) The most commonly reported symptoms were headaches and convulsions, occurring in 68.09% and 57.45% of cases, respectively. Caesarean sections accounted for 64.86% of deliveries. Maternal deaths and stillbirths accounted respectively for 27.66% and 40.54%.
Conclusion: HELLP syndrome remains a serious condition with high maternal and fetal mortality. Rapid, multidisciplinary and protocol-based management is essential to improve prognosis.

Keywords: HELLP syndrome, gynecology - obstetrics, CHU-ME.

Introduction
HELLP syndrome is a syndrome consisting of hemolysis, elevated liver enzymes and low platelet count [1]. It most often complicates 10% of severe pre-eclampsia cases, but can exceptionally occur in 10-20% of cases without high blood pressure [2].
In the United States, 15% of pregnant women with pre-eclampsia develop HELLP syndrome [3]. The prevalence of HELLP syndrome is estimated to be 2.2% in Africa [4]. In Mali, Bacoum *et al*. found a prevalence of 1.91% in a hospital study in 2024 [5]. In Cameroon, a prevalence of 6.7% in 2023 was observed by Yimlefack *et al*. [6]. In Ethiopia, a prevalence of 0.57% was found in a study conducted by Arusi *et al*. in 2022 [7].
In Chad, a few studies have focused on pre-eclampsia, but few studies have focused on HELLP syndrome.
It is one of the reasons for admission to our health facilities, and its management presents several challenges, particularly related to delayed diagnosis, the high financial cost of treatment and, above all, high maternal mortality. In view of this, we decided to conduct this study to evaluate the management and prognosis of HELLP syndrome.

Patients and Method
The Gynecology-Obstetrics Department of N'Djamena Mother and Child University Hospital served as the setting for our study. This was a descriptive cross-sectional study conducted over a two-year period (2020-2024).
It involved the files of patients admitted to the department of Gynecology-Obstetrics Department of the Mother and Child University Hospital during the study period.

We Included in this study patients hospitalized pregnant (term ≥ 20 weeks) or those in the postpartum period with a complete assessment meeting the criteria for HELLP syndrome. Data was collected using a survey form containing sociodemographic, clinical, paraclinical, therapeutic and prognostic variables. The analysis was performed using Word and Excel software.

Results

We recorded 47 cases of HELLP syndrome among 21,026 patients during the study period, giving a frequency of 0.22%.

Table 1: Sociodemographic data

Données sociodémographiques	n	%
Age		
≤ 20	12	25,28
[20-24]	16	34,04
[25-29]	4	8,51
[30-35]	7	14,89
≥35	8	17,02
Profession		
Ménagère	27	57.44
Élève/étudiante	11	23.40
Commerçante	6	12.77
Fonctionnaire	2	4.26
Coiffeuse	1	2.13
Residence		
Urban	38	80.85
Rural	9	19.15

The age group [20-24] accounted for 34.04%. The average age was 24±6.91 years. The extremes were 16 and 40 years. They were housewives in 57.44% of cases and came from rural areas in 80.85% of cases.

Clinical data

Table 2: Antécedenthistory

Antécédent	n	%
Gravida		
Primigravida	18	**38,30**
Paucigravida	17	36,17
Multigravida	7	14,90
Grand multigravida	5	10,63
Parity		
Nullipara	14	29,79
Primipara	7	14,89
Paucipara	15	31,91
Multipara	6	12,77
Grand multipara	5	10,64
Antecedents		
Intra uterine fetal death	2	4.26
Eclampsia	4	8.52
Gestational hypertension	3	6.38
Abruptio placenta	3	6.38

Primigravidas and nulliparas accounted for 38.30% and 29.79% respectively.
Eclampsia was observed in 8.52% of cases.

Table 3: Pregnancy

Déroulement de la grossesse	n	%
Pregnancy term	n	%
Unknown	10	21,28
[20 – 29]	2	4,26
[29 – 35]	14	29,79
[35 – 37]	5	10,64
≥37	16	34,04
Nomber of prenatal cares		
NO	15	53,19
1-4	17	36,17
≥4	5	10,64

A gestational age of more than 37 weeks of amenorrhea was reported in 34.04% (n=16) of cases. In 53.19% of cases, the pregnancy was not monitored.

Functional signs

Table 4: Functional signs

Functional signs	n	%
Headache	n	68.09
Blindness	10	25.53
Nausea/vomitment	2	29,79
Epigastric pain	14	34.04
Acouphena	5	34.04
Dizzines		36.17
Dyspnea	16	12.77

Headaches were found in 68.09% (n=32) of cases.

Biological parameters

In 89.36% of cases, transaminases, particularly ASAT, were three times higher than normal. 34.04% of patients had impaired renal function. Patients with hemoglobin levels between 7 and 11 g/dl accounted for 63.83%.

65.96% of cases presented with moderate thrombocytopenia.
Therapeutic aspects

Medical aspects

Alpha methyldopa was the most commonly used antihypertensive drug in 76.60% of cases, combined with furosemide in 23.40% of patients.
Magnesium sulphate was the most commonly used anticonvulsant in 89.36% of patients. Corticosteroid therapy using betamethasone was used in 21.28% of cases. 68.09% of patients received whole blood transfusions, while 10.64% of patients underwent dialysis.

Obstetric aspects

64.86% of deliveries were by caesarean section, and 19.15% of these were indicated for eclampsia.

Complications and prognosis

The most common maternal complication was acute renal failure, observed in 34.04% of cases, although the prognosis was favorable in 72.34% of cases.
Deliveries resulted in 59.46% live births, 68.18% newborns with

a poor APGAR score and 48.65% hypotrophy. 27.23% of these newborns were resuscitated at birth. Prematurity was the reason for transfer to neonatology in 21.28% of cases. The fetal prognosis was favorable in 81.82% of cases.

Discussion

In our study, we observed a hospital prevalence of 0.22%. This rate is close to that reported by Paudyal *et al*. [8] in Nepal in 2022 and by Arusi *et al*. [7] in Ethiopia, who reported 0.23% and 0.57% respectively. However, Bacoum *et al*. [5] in 2024 in Mali and Yimlefack *et al*. [6] in Cameroon in 2023 found higher frequencies, 1.81% and 6.7% respectively. This discrepancy can be explained by the size of the populations studied.

The most represented age group was [20-24], with an average age of 24±6.91 years. This result is similar to that of Gadappa *et al*. [9] in India in 2023, who reported the [20-25] age group as the most represented with an average age of 24±8.12 years, and that of Biradar *et al*. [10] in 2020 in India, who observed 23.6±4.15 years. In contrast, Kali *et al*. [11] in Turkey in 2022 found an average of 29.6±5.9 years. This is due to marriage in Chad and the high frequency of childbearing in this age group.

Housewives accounted for 51.06%. This result is lower than that reported by Bacoum *et al*. [5] in their series of studies, which found a figure of 86.70%. This difference can be explained by the high number of uneducated patients in our study, on the one hand, and on the other hand, by the fact that medical information is not accessible to these patients, who are often financially dependent. This factor constitutes a handicap in the prevention of this disease.

In this study, the majority of patients resided in urban areas, i.e. 80.85%. This result is higher than that observed by Kali *et al*. [11], who obtained 44.20%. This can be explained, on the one hand, by the fact that the study setting is urban and, on the other hand, by the difficult access for patients living in rural areas due to the lack of road infrastructure and medical transport.

Primigravida were the most represented group, at 38.30%. Bacoum *et al*. [5] found a similar result, with a rate of 32.40%. However, Anitha *et al*. [12] in India (2020) and Arusi *et al*. [7] in Ethiopia (2022) reported 58.93% and 64.40% respectively.

This can be explained by the fact that HELLP syndrome is one of the complications of pre-eclampsia, which occurs frequently in primigravida due to a less mature adaptation of the maternal vascular system and a less developed immune response due to the mother's first exposure to trophoblastic villi containing foreign antigens.

The average gestational age in our study was 34.11±4.21 weeks. This result is close to that of Arusi *et al*. [7], who found 33.40±4.47 weeks. In contrast, Yeşiler *et al*. [14] in India and Kali *et al*. [11] obtained 32.20±4.80 weeks' gestation and 32.20±0.40 weeks' gestation, respectively. This result can be explained by the fact that HELLP syndrome occurs, in most cases, in the third trimester of pregnancy.

The majority of patients did not attend prenatal consultations, i.e. 53.19%. This result is significantly higher than that of Yimlefack *et al*. [6], who observed 18.80%. This discrepancy can be explained by the high number of patients whose level of education does not allow them to understand the importance of prenatal consultations and by a low socio-economic status that does not allow them to attend medical follow-up.

The mean systolic and diastolic blood pressures were 162.09±31.15 mmHg and 103.28±21.86 mmHg, respectively. This result is comparable to that of Kali *et al*. [11], who obtained 161±28.3 mmHg and 102±21.48 mmHg. In contrast, Abdullahi *et al*. [14] in Uganda (2024) reported 171±16.13 mmHg and 111.96±19.6 mmHg. This result can be explained by the fact that HELLP syndrome is one of the complications of pre-eclampsia, manifesting as high blood pressure; Furthermore, a large number of patients showed signs of pre-eclampsia.

Headaches are the most common functional sign in 68.09% of cases, followed by dizziness in 36.17% of cases, then epigastric pain and tinnitus in 34.04% of cases. This result is comparable to that of Bacoum *et al*. [5], who found headaches, dizziness and epigastric pain in 43.30%, 35.70% and 14.08% of cases, respectively. In contrast, Yimlefack *et al*. [6] highlight headaches in 93.80% and epigastric pain in 87.50%. The frequency of headaches can be explained by high blood pressure, while the difference in epigastric pain could be due to its underestimation in this study.

Convulsions were found in 57.45% of cases. This result is lower than that reported by Yimlefack *et al*. [6], who reported 75.00%. This may be explained by the administration of anticonvulsants prior to admission, as the majority of patients are referred.

The average creatinine level is 17.49±22.09 mg/L. This result is similar to that of Abdullahi *et al*. [14], who obtained 19±14 mg/L. However, it is higher than those reported by Kali *et al*. [11] and Yeşiler *et al*. [13], who reported 7±2 mL/L and 12±8 mL/L, respectively. This result can be explained, on the one hand, by renal hypoperfusion leading to acute toxic tubular and cortical necrosis during HELLP syndrome and, on the other hand, by the delay in performing tests.

The diagnosis is made antepartum in 78.72% of cases. This result is comparable to those reported by Paudyal *et al*. [15] and Arusi *et al*. [5], who report 90.90% and 89.10% respectively. This reflects the fact that HELLP syndrome is a pregnancy-related condition and that the majority of patients are referred for better obstetric care due to a lack of qualified personnel at the lower levels of the healthcare pyramid.

Magnesium sulphate and alpha-methyldopa were the most commonly used medical treatments, in 69.09% and 76.60% of cases respectively. This contrasts with Yimlefack *et al*. [6], who found 81.20% for magnesium sulphate and 87.5% for nicardipine. This discrepancy could be explained by compliance with the contraindications for magnesium sulphate in cases of renal failure in our study. Methyldopa is the antihypertensive drug of choice used at the CHU-ME, while nicardipine is reserved for very high blood pressure readings. Whole blood was the most commonly used blood product in 68.09% of cases. This result is similar to that of Padmini *et al*. [16], who found 54.70%, but lower than that of Arusi *et al*. [7], who found 81.81%. This result could be explained, on the one hand, by the number of patients with hemoglobin levels below 11 g/dL and, on the other hand, by complications such as postpartum hemorrhage. The high rate of caesarean sections may also explain this frequency.

Caesarean section was the most common mode of delivery in 64.86% of cases. This result is comparable to those of Seshadri *et al*. [17] in 2021 in India and Yimlefack *et al*. [6], who reported 62.90% and 62.50% respectively. This can be explained by the fact that patients present with complications on the one hand, and on the other hand, the unpredictable course of the disease requires immediate termination of pregnancy. The fastest method being caesarean section, this justifies the high rate observed.

The maternal mortality rate in our study was 27.66%. This result is higher than that reported by Bacoum *et al*. [5] and Padmini *et al*. [15], who report 2.90% and 9.10% respectively.

Yimlefack *et al*. [6] found a rate of 56.00%. This high mortality rate could be explained by delayed diagnosis, late treatment, a

lack of obstetric intensive care units, poor access to dialysis and difficulties in accessing specific biological tests in resource-limited settings.

The rate of fresh stillbirths is 24.32%. This result is comparable to that of Yimlefack *et al*. [6], who observed 31.20%, but lower than that of Bacoum *et al*. [5], who found 44.60%. This result can be explained, on the one hand, by the fact that the majority of patients were referred, implying a delay in obstetric care.

Our study reported 8.54% neonatal deaths. This result is lower than that of Padmini *et al*. in India in 2025 [15] and Seshadri *et al*. [16], who found 18.18% and 14.43% respectively. This result can be explained, on the one hand, by full-term gestational age and, on the other hand, by a low rate of transfer to neonatal care.

Conclusion

This study revealed a relatively low hospitalization rate. HELLP syndrome mainly occurs in young, primigravida, uneducated patients, with a diagnosis made mainly in the pre-partum period, around 34 weeks of amenorrhea. The dominant clinical signs were headaches and convulsions. Treatment is based on the administration of alpha-methyldopa and magnesium sulphate, combined with emergency fetal extraction, most often by caesarean section. The maternal-fetal prognosis remains worrying, with high rates of renal complications, maternal mortality and stillbirths.

Conflict of Interest

Not available

Financial Support

Not available

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