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ORIGINAL ARTICLE

FREQUENCY OF HELLP SYNDROME IN PATIENTS WITH HYPERTENSIVE DISORDERS AT KHALIFA GUL NAWAZ TEACHING HOSPITAL, BANNU.

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Abstract

Background: HELLP syndrome is a severe form of hypertensive disorder in pregnancy characterized by hemolysis, elevated liver enzymes, and low platelet count. It is associated with high maternal morbidity and mortality and contributes significantly to adverse maternal and perinatal outcomes.

Objectives: To determine the frequency of HELLP syndrome among pregnant women with hypertensive disorders and to assess its association with selected maternal and clinical characteristics.

Materials and Methods: A cross-sectional study was conducted at Khalifa Gul Nawaz Teaching Hospital from January to June 2024, involving 161 women diagnosed with gestational hypertension, preeclampsia, or eclampsia after 20 weeks of gestation or within 10 days postpartum. Women with pre-existing hepatic, renal, or hematologic disease were excluded. Data on maternal age, gestational age, parity, seizure presentation, and prior hypertensive disorders were collected. HELLP syndrome was diagnosed using standard laboratory criteria. Associations were analyzed using chi-square tests.

Results: HELLP syndrome was identified in 41.0% (n=66) of patients. The mean maternal age was 28.4 ± 4.5 years and mean gestational age was 36.7 ± 1.8 weeks. HELLP syndrome showed no significant association with maternal age (p=0.43), gestational age (p=0.64), parity (p=0.54), antenatal versus postnatal presentation (p=0.83), or prior hypertensive disorder (p=0.76). A near-significant association was observed between HELLP syndrome and presentation with seizures (p=0.07).

Conclusion: HELLP syndrome was frequent among women with hypertensive disorders in this setting; however, it was not significantly associated with demographic or routine clinical characteristics. This indicates that HELLP syndrome may occur even in women without obvious risk factors, underscoring the importance of vigilant monitoring and timely laboratory screening for early detection.

Keywords: HELLP Syndrome, Hypertensive Disorders of Pregnancy, Preeclampsia, Eclampsia, Maternal Outcomes.

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Introduction:

Hypertensive disorders of pregnancy are a significant cause of maternal and perinatal morbidity and mortality and almost 500,000 women die due to complications of pre-eclampsia related issues every year, with HELLP syndrome—defined as Hemolysis, Elevated Liver enzymes, and Low Platelets—being one of the most severe complications[1,2]. Its progression can result in multi-organ failure, maternal death, and adverse neonatal outcomes[2].

The Tennessee classification system divides HELLP syndrome into complete and partial (or incomplete) forms. Complete HELLP syndrome requires the presence of three key components: microangiopathic hemolytic anemia, elevated liver enzymes, and low platelet count while Partial or incomplete HELLP syndrome is diagnosed when only one or two of these components are present3.HELLP syndrome is a critical obstetric Complication affecting 0.1–0.6% of all pregnancies globally and occurs in 10–20% of patients with severe preeclampsia.[4]It leads to approximately 3.4–25% of maternal mortality and up to 34%-60% of perinatal mortality[5].

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The incidence of preeclampsia varies significantly across regions, posing challenges in estimating its global burden and formulating universal preventive strategies as reported in a meta-analysis showing global incidence of preeclampsia 4.6%, with notable regional differences, such as 1.0% in the Eastern Mediterranean and 5.6% in Africa6.Pakistan has high prevalence reaching up to 15% of hypertensive disorders of pregnancy, including HELLP syndrome7causing high maternal mortality, with three women losing their lives every hour due to hypertensive pregnancy complications in Pakistan[8].

In developed countries, advancements in antenatal care and early diagnosis have significantly reduced maternal and neonatal mortality associated with HDP. However, in developing countries, including Pakistan, the burden remains disproportionately high due to delayed diagnosis, lack of access to quality healthcare, and inadequate management protocols[9].

This study aims to assess the frequency of HELLP syndrome in patients presenting with hypertensive disorders at Khalifa Gul Nawaz Hospital, Bannu. Although this topic has been widely studied around the globe but there is a lack of sufficient data in Pakistan, especially in rural regions. HELLP syndrome typically occurs in the context of preeclampsia and is characterized by specific laboratory findings. Early identification and management are crucial to improving outcomes for both mothers and infants. Limited data are available on the incidence of HELLP syndrome in the region, which may hinder effective clinical management and resource allocation. This study aims to determine the frequency, demographic and clinical characteristics associated with HELLP syndrome among patients with hypertensive disorders presenting to Khalifa Gul Nawaz Teaching Hospital.

Material and Method:

Study time and duration:

This cross-sectional study was conducted at Khalifa Gul Nawaz Teaching Hospital, from January to June 2024,

Study Design and Settings:

This prospective cross-sectional study was conducted among pregnant women presenting with hypertensive disorders at Khalifa Gul Nawaz Teaching Hospital.

Sample size calculation:

The sample size was calculated using the OpenEpi sample size calculator, based on a prevalence of HELLP syndrome of 18.6% reported in a previous study10, with a 95% confidence level and a margin of error of 6%. This yielded a required sample size of approximately 161 participants to estimate the frequency of HELLP syndrome accurately.

Inclusion criteria:

we studied all patients admitted during pregnancy or within 10 days postpartum who had blood pressure elevation first detected after mid-pregnancy (≥20 weeks gestation) including gestational hypertension (elevated blood pressure without proteinuria), **preeclampsia,** defined as a minimum blood pressure of 140/90 mmHg after 20 weeks of gestation with proteinuria >300 mg in a 24-hour urine collection or 1+ on a dipstick test, and **eclampsia**, defined as seizures not attributable to other causes in women with preeclampsia. Gestational age was determined through last menstrual period date and early pregnancy ultrasonography and HELLP syndrome was defined as a triad of hemolysis (hemoglobin level<10.5g/dl), elevated liver enzymes (AST>30 IU/L, serum bilirubin>1mg/dl), and low platelets(<150,000/microliter) including Partial HELLP syndrome when only one or two components of this triad were present.

Exclusion criteria:

Patients with chronic hypertension, liver disease, renal disease, or hematological disorders prior to pregnancy were excluded.

Data Collection Procedure:

Data were collected prospectively from all pregnant women presenting with hypertensive disorders at Khalifa Gul Nawaz Hospital. Upon admission, patients were screened to determine eligibility based on the inclusion and exclusion criteria. Demographic and clinical information, including age, parity, gestational age at admission, presentation of fits and history ofhypertensive disorders in previous pregnancy was recorded. Laboratory investigations were performed to diagnose HELLP syndrome including hemoglobin levels, platelet counts and liver enzyme levels (SGPTand serum bilirubin). All collected information was recorded in a predesigned Proforma.

Ethical Considerations:

Approval was obtained from the hospital's ethical review board of Khalifa Gul Nawaz Teaching Hospital. Informed consent was obtained from all participants and patient confidentiality was maintained throughout the study.

Data Analysis:

Data analysis was conducted using SPSS software, version 25. Continuous variables such as age, gestational age, were summarized as means and standard deviations. Categorical variables, including parity, presenting symptoms of fits, history of hypertensive disorders in previous pregnancy (HDP), and the presence of HELLP syndrome, were analyzed as frequencies and percentages. The frequency of HELLP syndrome was calculated as the proportion of patients diagnosed with the condition out of the total participants. Subgroup analysis was performed to assess the relationship between HELLP syndrome and demographic

or clinical characteristics such as age, gestational age, parity, and presenting symptoms of fits and previous history of HDP. Chi-square test was used to compare proportions between subgroups and p-value of ≤0.05 was considered statistically significant.

Results:

Out of the 161 women included in the study, 66 (41.0%) were diagnosed with HELLP syndrome, whereas 95 (59.0%) did not have HELLP (Figure 1). The overall mean age was 28.4 ± 4.5 years, and the mean gestational age at the time of diagnosis was 36.7 ± 1.8 weeks (Table 1), indicating that most patients presented in late pregnancy. Among the study population, 59 (36.6%) were nulliparous and 102 (63.4%) were nulliparous (Table 2), reflecting a predominance of women with previous pregnancies.

When maternal characteristics were compared between those with and without HELLP syndrome, no statistically significant associations were observed for age, gestational age, parity, antenatal or postnatal presentation, or previous history of hypertension ($p > 0.05$). Although not statistically significant, patients who presented with seizures showed a noticeable trend toward a higher frequency of HELLP syndrome, suggesting that seizure onset may be an important clinical indicator in this population (Table 3).

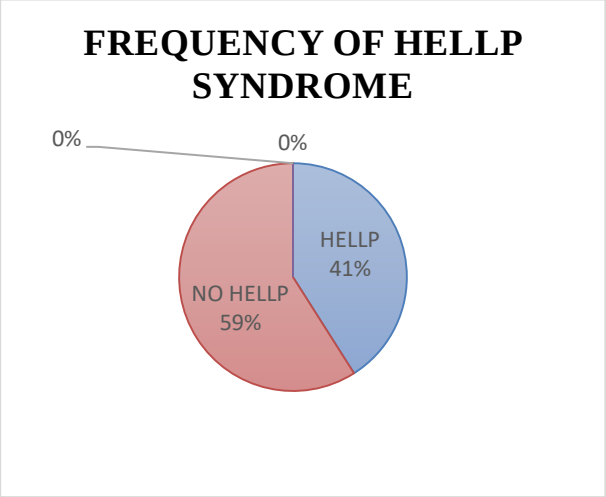

FIGURE I: FREQUENCY OF HELLP SYNDROME

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF PATIENTS

Variable	Mean	Std. Deviation	Minimum	Maximum
Age (years)	28.4	±4.5	18	42
Gestational Age (weeks)	36.7	±1.8	34	40

TABLE2: DISTRIBUTION OF PATIENTS BY PARTIY

Parity Group	Frequency (n)	Percentage (%)
Nulliparous	59	36.6%
Multiparous >1	102	63.4%
Total	161	100%

TABLE 3: PATIENT VARIABLES AND HELLP SYNDROME

Variable	Category	HELLP (yes)	HELLP (No)	Total	p-value
Age Groups	15-25 years	34	51	85	.774
	26–35 years	25	39	64	
	>35 years	6	6	12	
Gestational Age Groups	21-28 weeks	6	3	9	.103
	29-35 weeks	17	20	37	
	>36 weeks	31	60	91	
Parity Groups	Nulliparous	22	37	59	.544
	Multiparous	43	59	102	
Antenatal vs. Postnatal	Antenatal	54	84	138	.431
	Postnatal	11	12	23	
Fits	Present	37	41	78	.07
	Absent	28	55	83	
History of HDP	Yes	16	25	41	.839
	No	49	71	40	

Discussion:

The high frequency of HELLP syndrome (41%) observed in this study exceeds that reported in other studies (10–28%) [11, 12, 13.]While it is attributed to late presentation and inadequate antenatal care, the study did not collect direct data on these factors. Future studies should assess antenatal attendance patterns, referral delays, and healthcare access to validate this association.

The mean maternal age (28.4 ± 4.5 years) and predominance of multiparous women (63.4%) align with prior research, suggesting that HELLP syndrome commonly affects women in their late twenties14. Most cases occurred after 36 weeks of gestation, consistent with the literature indicating third-trimester predominance[15,16]. Seizures were a common presenting feature (47%), highlighting the severe clinical nature of HELLP syndrome in this cohort.

Clinical Implications

The findings underscore the importance of early detection and screening for hypertensive disorders during antenatal visits. Routine blood pressure monitoring, urine protein testing, and liver enzyme/platelet evaluations in high-risk pregnancies could enable earlier diagnosis. Additionally, improved obstetric training, health system strengthening,

and community awareness programs are vital to ensure timely recognition and management of HELLP syndrome, particularly in resource-limited settings.

Limitations

This study is limited by its small sample size and single-center design, which may affect generalizability. Moreover, the lack of biochemical confirmation of hemolysis (e.g., LDH levels) and the absence of neonatal outcome data restricts a comprehensive evaluation of disease severity and perinatal impact. Future multicenter studies with broader data collection are recommended.

Conclusion:

In conclusion, HELLP syndrome was identified in 41% of women with hypertensive disorders of pregnancy in our study, with most cases occurring in the third trimester and among multiparous women. The high incidence highlights the need for strengthened antenatal screening and clinical vigilance to enable early diagnosis and timely management. Addressing healthcare access barriers and improving provider training could significantly reduce the burden of HELLP syndrome and related maternal complications.

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