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Evaluation of Preeclampsia Patients – 3 Years of Data

Preeklampsi Hastalarının Değerlendirilmesi – 3 Yıllık Veri

Güven Arslan[1], Erkan Mavigök[2], Ayşe Nur Mavigök[1]

[1]Kahramanmaraş Necip Fazıl City Hospital, Kahramanmaraş, Türkiye
[2]Nizip Private Adn Hospital, Gaziantep, Türkiye

ABSTRACT

Introduction: Preeclampsia is the most important cause of maternal, fetal, and neonatal morbidity and mortality worldwide, affecting approximately 4% of all pregnancies.
Objective: Patients admitted to our clinic and diagnosed with non-severe preeclampsia, severe preeclampsia, HELLP syndrome, and eclampsia were retrospectively examined, and the demographic, clinical, and laboratory data obtained from these patients were compared with the diagnostic groups.
Method: A total of 156 patients, including 63 with non-severe preeclampsia, 84 with severe preeclampsia, 6 with HELLP syndrome, and 3 with eclampsia, who were followed up and treated in our center, were evaluated. Patient characteristics were classified by comparing the groups regarding delivery methods, demographic characteristics, and clinical and laboratory parameters.
Results: In terms of maternal complications, peripartum hemorrhage and placental abruption were more common in the eclampsia and severe preeclampsia groups. At the same time, DIC was more common in the patient group diagnosed with HELLP syndrome, and these results were found to be statistically significant ($p<0.05$). When demographic, clinical, and laboratory data were compared with whether maternal complications developed, the rate of maternal complications was found to be significantly higher in patients with elevated AST and ALT. No maternal mortality occurred in any of the patient groups.
Conclusion: The higher rate of maternal complications in patients with elevated AST and ALT suggested that follow-up of this patient group in the intensive care unit will be beneficial in reducing maternal morbidity and mortality.

Keywords: Preeclampsia, Risk Factors, Disease Severity.

ÖZET

Giriş: Preeklampsi tüm gebeliklerin yaklaşık %4'ünü etkileyen, dünya çapında anne, fetus ve neonatal morbidite ve mortalitenin en önemli nedenidir.
Amaç: Kliniğimize başvuran ve gebeliğin hipertansif bozuklukları arasında yer alan, şiddetli özellik göstermeyen preeklampsi, şiddetli özellik gösteren preeklampsi, HELLP sendromu ve eklampsi tanısı alan hastaları retrospektif olarak incelenerek bu hastalardan elde edilen demografik, klinik ve laboratuvar verilerinin tanı grupları ile karşılaştırması yapılmıştır.
Metod: Merkezimizde takip ve tedavisi yapılan 63 şiddetli özellik göstermeyen preeklampsili, 84 şiddetli özellik gösteren preeklampsili, 6 HELLP sendromlu, 3 eklampsili olmak üzere toplam 156 hasta değerlendirildi. Doğum şekilleri, demografik özellikleri, klinik ve laboratuvar parametreleri açısından gruplar arasında karşılaştırma yapılarak hasta özellikleri sınıflandırıldı.
Bulgular: Maternal komplikasyonlar açısından peripartum hemoraji ve plasenta dekolmanı, eklampsi ve şiddetli özellik gösteren preeklampsi grubunda daha sık görülürken, DİC, HELLP sendromu tanılı hasta grubunda daha sıktı ve bu sonuçlar da istatistiksel olarak anlamlı bulundu ($p<0,05$). Maternal komplikasyon gelişip gelişmediği ile demografik, klinik ve laboratuvar verileri kıyaslandığında, AST ve ALT yüksekliği olan hastalarda maternal komplikasyon gelişme oranı anlamlı derecede yüksek bulundu. Hasta gruplarının hiçbirinde maternal mortalite gelişmedi.
Sonuç: AST ve ALT yüksekliği olan hastalarda maternal komplikasyon gelişme oranının daha yüksek bulunması, bu hasta grubunun yoğun bakım ünitesinde takibinin, maternal morbidite ve mortaliteyi azaltmak açısından faydalı olacağını düşündürmektedir.

Anahtar Kelimeler: Preeklampsi, Risk Faktörleri, Hastalık Şiddeti.

INTRODUCTION

Preeclampsia is the most important cause of maternal, fetal, and neonatal morbidity and mortality worldwide, affecting approximately 4% of all pregnancies. It is one of the few pathological conditions specific to pregnancy. Definitionally and nominally, it is a precursor to eclampsia, a potentially more severe disease, but itself can be fatal. The main treatment for centuries has been birth. It has not changed and is still the same. Its incidence has increased in recent decades even in developed countries (1).

Corresponding Author: Arslan Güven, e-mail: guvenarslan27@gmail.com
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Preeclampsia is a part of hypertensive disorders of pregnancy, and other disorders can be listed as gestational hypertension, chronic hypertension, and preeclampsia developing based on chronic hypertension. Hypertensive disorders during pregnancy cause clinically serious and complex complications and constitute a significant burden of disease in both developed and underdeveloped countries. Eclampsia (seizures associated with preeclampsia) and HELLP (hemolysis, elevated liver enzymes, low platelet value) Syndrome are other serious disorders of pregnancy that can develop without or before hypertension (2, 3).

In early-onset disease, premature and defective placental development occurs. In late-onset preeclampsia, underlying metabolic and cardiovascular risks cause endothelial dysfunction due to over-activated systemic inflammation. Its multifactorial pathogenesis, which can occur in different phenotypes, has not yet been fully explained, and it is still impossible to predict and prevent the disease (4). Symptomatic clinical management should be aimed at preventing maternal morbidity (e.g., eclampsia) and mortality. In early-onset preeclampsia, approaches to continue pregnancy aimed at improving perinatal outcomes should not cause incorrect timing of birth, which is the only definitive treatment method. Preeclampsia increases the incidence of cardiovascular and metabolic diseases later in life, thus necessitating lifestyle education and research for the post-illness period (5).

Within the scope of this research, we aimed to elucidate the status of the patients who applied to our clinic with diagnoses of non-severe preeclampsia, severe preeclampsia, and HELLP syndrome to determine which data can be utilized as signs of maternal and fetal mortality and morbidities.

METHOD

In our study, the demographic and clinical data of 156 pregnant women diagnosed with severe preeclampsia, non-severe preeclampsia, and HELLP syndrome who had delivery at Kahramanmaraş Sütçü İmam University Health Practice and Research Hospital Gynecology and Obstetrics Clinic, were evaluated retrospectively.

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from our institution with protocol number 14/465-18, and informed consent has been obtained from all participants.

For the diagnosis of preeclampsia, systolic blood pressure ≥140 mmHg or diastolic blood pressure of ≥90 mmHg measured at least 4 hours apart, systolic blood pressure ≥160 mmHg and diastolic blood pressure ≥110 mmHg in a single measurement in emergency situations; additionally urinary protein excretion of 300 mg or more in 24 hours or detection of ≥ +1 proteinuria by dipstick and development of hypertension after the 20th week of gestation in a previously normotensive patient were used as criteria. Patients who did not meet the criteria were not included in the study. Patients were evaluated for thrombocytopenia, renal failure, liver dysfunction, pulmonary edema, and cerebral or visual disorders that indicate systemic involvement.

The patients were divided into four groups: preeclampsia without severe features, preeclampsia with severe features, HELLP syndrome, and eclampsia. In the preeclampsia group with severe features, detection of blood pressure ≥160 mmHg systolic or ≥110 mmHg diastolic in at least two measurements with an interval of 4 hours, thrombocytopenia (platelet count <100,000/μL), impaired liver functions (2-fold increase in liver enzymes) were considered. The patients were examined for the presence of persistent right upper quadrant/epigastric pain unresponsive to medication, progressive renal insufficiency (serum creatinine >1.1 mg/dL or doubling of creatinine level without another renal disease), pulmonary edema, cerebral or visual disturbances. Patients who met one of these criteria but were not evaluated as HELLP or eclampsia were included in the 'severe preeclampsia' group. Patients who did not have these features and were not evaluated as HELLP or eclampsia were also included in the 'non-severe preeclampsia' group. In patients evaluated with HELLP syndrome. They met the criteria of elevated liver enzymes [AST (Aspartate aminotransferase) and/or ALT (Alanine aminotransferase) ≥ 80 IU/L], thrombocytopenia (<100000 μ/L) and hemolysis [LDH (Lactate dehydrogenase ≥ 600 IU/L). While creating the eclampsia patient group, the patients were included according to the presence of

seizures that were not caused by a different etiology and meeting the preeclampsia criteria. According to these criteria, the patients were evaluated and: 63 patients had preeclampsia without severe features, 84 patients had preeclampsia with severe features; a total of 156 patients, six patients with HELLP syndrome and three patients with eclampsia, were included in the study.

Demographic and clinical data were obtained from the patient's files. Maternal age at the time of admission, week of gestation when preeclampsia was diagnosed, gravida and parity values, whether or not they smoked, height (m) and weight (kg), systolic and diastolic blood pressure values, and BMI were determined. As laboratory data, maternal hemoglobin (g/dL) level, platelet count (μ/L), AST (IU/L), and ALT (IU/L) values were recorded before and after birth. Week of birth, systolic and diastolic blood pressure values, newborn weight (g), newborns' 5th-minute birth weight. APGAR scores, mode of delivery, postpartum transfusion need [erythrocyte, FFP (Fresh frozen plasma), platelet], intensive care unit hospitalization rates of mothers, maternal-fetal mortality, and complications were determined. In our study, the height and weight values of 41.3% of the non-severe preeclampsia group, 53.6% of the severe preeclampsia group, 33.3% of the HELLP syndrome group, and 33.3% of the eclampsia group could be reached, and BMI values were reached. could be calculated. BMI was calculated by dividing the patient's weight in kg by the square of their height in m. Based on the classification determined by WHO according to BMI, those with a BMI of 30 (kg/m2) or above are considered obese. In addition, those with a BMI below 18.5 were classified as underweight, those with a BMI between 18.5 and 24.9 were classified as normal, and those with a BMI between 25 (kg/m2) and 29.9 (kg/m2) were classified as overweight. Hospitalization times were calculated in hours.

Patients were evaluated for fetal complications according to the parameters of prematurity, fetal distress, oligohydramnios, IUGR (Intra-uterine growth retardation), intrauterine death, and early neonatal death. In terms of maternal complications, DIC was evaluated according to postpartum hemorrhage, placental abruption, AKI (Acute renal failure), ICH (Intra cranial hemorrhage), ARDS (Adult respiratory distress syndrome), and maternal mortality parameters.

Statistical Analysis

Patient data collected within the scope of the study were analyzed with the IBM Statistical Package for the Social Sciences (SPSS) for Windows 26.0 (IBM Corp., Armonk, NY) package program. Frequency and percentage for categorical data and mean and standard deviation for continuous data were given as descriptive values. For comparisons between groups, the “Independent Sample T–test” was used for two groups, and the “Pearson Chi-Square Test” was used to compare categorical variables. The results were considered statistically significant when the p-value was less than 0.05.

RESULTS

There were 156 pregnant women diagnosed with severe preeclampsia, non-severe preeclampsia, eclampsia, and HELLP syndrome who had delivery in our clinic. The patients were examined in 4 groups: 40.4% (n=63) of these patients had non-severe preeclampsia, 53.8% (n=84) had severe preeclampsia, 3.8% (n=6) had HELLP syndrome, 1.9% (n=3) had eclampsia. No statistically significant difference was observed between the groups in terms of BMI, mean gravida, and parity values. The average diagnosis week in the severe preeclampsia group was found to be higher than the other groups (mean=36.6±3). The average week of diagnosis in the HELLP syndrome and eclampsia groups was lower than in the other groups (mean=31.4±1.9, mean=32.1±3.3, respectively). The average week of birth was found to be high (mean=37.6±1.8) in the non-severe preeclampsia group. The mean week of birth was 34.6±3.6 in the severe preeclampsia group, 31.5±1.9 in the HELLP group, and 32.2±3.4 in the eclampsia group (Table 1).

When the mean platelet counts were compared, a significant statistical difference was detected between the non-severe preeclampsia and HELLP syndrome groups ($p<0.001$). Likewise, a statistically significant difference was found between the preeclampsia and HELLP syndrome groups regarding platelet counts ($p<0.001$). Platelet counts in HELLP syndrome patients were significantly lower than in both groups (Table 2). The AST value in the HELLP syndrome patient group was statistically significantly higher than that of the non-severe preeclampsia group ($p<0.001$). When the severe

preeclampsia group and the HELLP group were compared, the AST values of the HELLP syndrome group were statistically significantly higher (p<0.001). The AST values of the HELLP syndrome group were statistically significantly higher (p=0.03). The ALT values of the HELLP syndrome group were statistically significantly higher (p=0.001). ALT values were significantly higher in the HELLP syndrome group (p<0.001).

Table 1. Comparison of Patient's Demographic and Clinical Parameters

	Non-severe preeclampsia	Severe preeclampsia	HELLP Syndrome	Eclampsia
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Age (years)	29 ± 8	31 ± 7	30 ± 5	33 ± 9
Height (m)	162 ± 5	159 ± 6	158 ± 4	158 ± -
Weight (kg)	82 ± 15	82 ± 15	73 ±	80 ± -
Body Mass Index (kg/m^2)	32,3 ± 5,4	32,5 ± 5	30,7 ± 2,5	32 ± -
Gravidy	3 ± 2	3 ± 2	3 ± 1	4 ± 3
Parity	2 ± 2	2 ± 2	2 ± 1	2 ± 2
Week of Diagnosis	36,6 ± 3	34,1 ± 3,8	31,4 ± 1,9	32,1 ± 3,3
Week of Delivery	37,6 ± 1,8	34,6 ± 3,6	31,5 ± 1,9	32,2 ± 3,4

From the perspective of peripartum hemorrhage development, a statistically significant increase was found in the severe preeclampsia group compared to the HELLP syndrome group (10.7% vs. 0.0%, p=0.013). From the perspective of detachment, a statistically significant increase was found in the eclampsia group compared to the non-severe patient group (33.3% vs. 0.0%, p=0.005). When the eclamptic and severe patient groups were compared regarding detachment, a statistically significant increase was detected in the eclampsia group (33.3% vs. 3.6%, p = 0.014). When the eclampsia patient group and the HELLP syndrome patient groups were compared in terms of detachment, the detachment rate was statistically higher in the eclamptic patient group (33.3% vs. 0.0%, p = 0.026). When the patient groups were compared in terms of DIC, a statistically significant increase in the incidence of DIC was detected in the HELLP syndrome group compared to the non-severe preeclampsia group (50.0% vs. 0.0%, p<0.001). When the HELLP syndrome group and the severe preeclampsia group were compared in terms of DIC, the incidence of DIC was significantly higher in the HELLP syndrome group (50.0% vs. 1.2%, p<0.001). When the HELLP syndrome group was compared with the eclampsia group, the rate of DIC was statistically significantly higher in HELLP syndrome (50.0% vs. 0.0%, p<0.001).

Table 2. Comparison of Laboratory Parameters

	Non-severe preeclampsia	Severe preeclampsia	HELLP Syndrome	Eclampsia	Total		
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	F	p-value
Prenatal Hemoglobin	11,96±1,40	12,48±1,77	12,72±1,72	13,13±0,85	12,29±1,63	1,650	0,180
Postpartum Hemoglobin	10,77±1,40	11,06±1,51	10,67±1,28	11,13±0,68	10,93±1,45	0,578	0,630
Platelet Count	254523±72306^{c}	229428±87949^{c}	81500±33170^{a,b}	203000±42320	233365±85981	8,660	**0,001***
AST	22,02±5,51^{c}	56,50±138,60^{c}	266,00±144,69^{abd}	56,67±55,73^{c}	50,63±114,73	9,879	**0,001***
ALT	17,83±10,31^{c}	50,14±143,98^{c}	227,00±118,75^{ab}	60,67±66,00	44,10±115,13	6,959	**0,001***

** The difference is statistically significant; a:0.05; Pots-hoc; Scheffe test, Tukey Test; Tamhane T2 test; a The difference with the non-severe preeclampsia group is statistically significant; b The difference with the preeclampsia group with severe features is statistically significant; c The difference with the HELLP group is statistically significant; d The difference with the eclampsia group is statistically significant*

From the perspective of peripartum hemorrhage development, a statistically significant increase was found in the severe preeclampsia group compared to the HELLP syndrome group (10.7% vs. 0.0%, p=0.013). From the perspective of detachment, A statistically significant increase was found in the eclampsia group compared to the non-severe patient group (33.3% vs. 0.0%, p=0.005). When the eclamptic and severe patient groups were compared regarding detachment, a statistically significant increase was detected in the eclampsia group (33.3% vs. 3.6%, p = 0.014). When the eclampsia patient group and the HELLP syndrome patient groups were compared in terms of detachment, the detachment

rate was statistically higher in the eclamptic patient group (33.3% vs. 0.0%, p = 0.026). When the patient groups were compared in terms of DIC, a statistically significant increase in the incidence of DIC was detected in the HELLP syndrome group compared to the non-severe preeclampsia group (50.0% vs. 0.0%, p<0.001). When the HELLP syndrome group and the severe preeclampsia group were compared in terms of DIC, the incidence of DIC was significantly higher in the HELLP syndrome group (50.0% vs. 1.2%, p<0.001). When the HELLP syndrome group was compared with the eclampsia group, the DIC rate was statistically significantly higher in HELLP syndrome (50.0% vs. 0.0%, p<0.001).

The patient groups were compared according to the development of the need for follow-up in intensive care, and the results were statistically significant (p<0.001). The need for postpartum intensive care follow-up developed in 83.3% of HELPP Syndrome patients and 66.7% of eclampsia patients.

Classification of patient groups according to 5th Minute APGAR scores was statistically significant (p<0.05). The mean APGAR score of the non-severe preeclampsia group was statistically significantly higher than the severe preeclampsia group (9.32 ± 1.2 vs. 8.37 ± 2.4, p<0.05). No statistically significant difference was detected between the other groups.

Statistically significant data were also obtained when comparing the postpartum blood product transfusion of patients and patient groups. The rate of receiving Fresh Frozen Plasma and Platelet transfusion in patients diagnosed with HELLP syndrome was found to be statistically significantly higher compared to other groups (p<0.01).

Table 3. Comparison of Demographic, Clinical and Laboratory Data According to the Presence of Maternal Complications

	Complications			
	No	Yes		
	Mean±SD	Mean±SD	t	p-value
Age	30,15 ± 6,930	31,18±8,010	0,416	0,685
Gravidy	2,96 ± 1,947	2,73±1,272	0,569	0,579
Parity	1,65 ± 1,656	1,45±1,293	0,478	0,641
Fetal Birth Weight (gr)	2491,10±879,912	1906,36±581,038	3,074	0,008
Week of Diagnosis	35,218±3,6166	33,318±3,8561	1,580	0,141
Systolic Blood Pressure	159,15±13,255	168,18±16,624	-1,759	0,106
Diastolic Blood Pressure	99,57±9,171	107,73±13,297	-1,997	0,072
Postpartum Hemoglobin Value	11,039±1,3736	10,118±1,6916	1,761	0,106
Prenatal Hemoglobin Value	12,376±1,4908	11,209±2,7869	1,373	0,198
AST	44,26±112,771	141,18±127,021	2,456	0,031*
ALT	38,77±115,097	118,64±115,523	2,209	0,048*
Platelet Count	237645±78783	192636±154470	0,957	0,360

**The difference is statistically significant*

The highest blood pressure values were found in the eclampsia group (mean = 196.6±5.7). Then, patients diagnosed with HELLP syndrome (mean = 175±13.7), severe patient group (mean = 166.8±9.4), and non-severe patient groups (mean = 147.8±6.8) were listed. Statistically significant differences were detected when comparing the groups in terms of mean systolic and diastolic blood pressures. Systolic blood pressure values were statistically significantly lower in the non-severe preeclampsia group compared to all other groups (p<0.05). When the eclampsia group was compared with the other groups, a statistically significant increase in systolic blood pressure values was detected in the eclampsia patient group compared to all three groups (p <0.05). When the HELLP syndrome patient group was compared with the other groups, systolic blood pressure values were statistically significantly higher in the HELLP syndrome patient group than in the non-severe patient group (p<0.05).

When the patient groups were compared according to fetal birth weights, it was seen that babies born from mothers diagnosed with HELLP syndrome had the lowest birth weights and were generally born below 2000 grams. The results in patients with eclampsia were also similar to those with HELLP syndrome. Babies with the highest birth weights were born to patients with non-severe preeclampsia.

When comparing patient groups according to the presence of maternal complications, the probability of developing complications was statistically significantly higher in patients with elevated AST and ALT ($p<0.05$) (Table 3). In patients who developed complications, the average AST value was 141.18±127.021, and the average ALT value was 118.64±115.523. In the patient group without complications, the average AST value was 44.26±112.771, and the average ALT value was 38.77±115.097. No significant statistical difference was detected between the patient groups regarding age, gravida, and parity values, systolic and diastolic blood pressures, prenatal and postpartum hemoglobin values, platelet counts, and complications.

The premature birth rate was 27% (n=17) in the non-severe preeclampsia group, 73.8% (n=62) in the severe preeclampsia group, 100% (n=6) in the HELLP Syndrome group, and 100% (n=3) in the eclampsia group. When comparing the HELLP and eclampsia groups with the other groups, premature birth rates were found to be statistically significantly higher in the HELLP and eclampsia groups ($p<0.01$) (Table 4).

Tablo 4. Comparison of Patient Groups According to Premature Birth Rates

		Non-severe preeclampsia	Severe preeclampsia	HELLP Syndrome	Eclampsia	p-value
Premature	n	17	62	6	3	**0,01***
	%	27,0	73,8	100,0	100,0	
Term	n	46	22	0	0	
	%	73,0	26,2	0	0	

DISCUSSION

Although the incidence of preeclampsia corresponds to 3% of pregnancies, the rate of all hypertensive disorders during pregnancy varies between 5% and 10%. The incidence of eclampsia was 2.7 per 10.000 births in the United Kingdom in 2005, 5.7 per 10,000 births in Canada in 2007, 5 per 10.000 births in Denmark, Norway and Sweden between 1998 and 2000, and 5 per 10.000 births in the Netherlands in 2007. It was 6 in 10.000 births and 8.2 in 10.000 births in the USA between 1996 and 2004 (3). In studies conducted in Turkey, the incidence of preeclampsia was 2.9% and the incidence of eclampsia was 0.4% (6).

During the course of this study, there were 5.707 births in our clinic. We found the rate of hypertensive disease during pregnancy to be 2.7% (156 patients). The frequency of preeclampsia without severe features was 1.1% (63 patients), the frequency of preeclampsia with severe features was 1.47% (84 patients), the frequency of HELLP syndrome was 0.1% (6 patients), the frequency of eclampsia was 0.05% (3 patients). In our study, no significant difference was found between maternal age and patient groups with severe preeclampsia, non-severe preeclampsia, HELLP syndrome, and eclampsia. In a study conducted by Yıldırım et al., it was concluded that patients with HELLP syndrome had a higher maternal age than patients with severe preeclampsia and eclampsia. Again, in this study, gravida and parity values were found to be high in HELLP syndrome. The rate of birth by cesarean section was found to be high in the eclampsia group (7). However, we did not detect such a difference in our study. We did not detect a statistically significant difference in comparing patient groups with maternal age, gravida values, parity values, and delivery methods ($p>0.05$).

In a study conducted by Shao et al., it was stated that high pre-pregnancy BMI increased the risk of preeclampsia, but this risk was close to each other in terms of preeclampsia subgroups (8). In our study, no statistically significant difference was found when hypertensive pregnant patient groups were compared with their BMIs. Obesity rates were 61.5% in the non-severe preeclampsia group, 69.6% in the severe preeclampsia group, 50% in the HELLP syndrome group, and 100% in the eclampsia group.

In our study, as mentioned in the definition of HELLP syndrome, the frequency of liver enzyme elevation and thrombocytopenia was statistically significantly higher in the HELLP syndrome patient group. We also concluded that elevated AST and ALT levels may be predictive of maternal complications.

In a study conducted in the USA, it is stated that there is a 3-fold increase in preeclampsia and a 25-fold increase in eclampsia in terms of maternal complications (9). In a study conducted in our country, placental abruption was 10.5% and DIC was 7% in pregnant women diagnosed with preeclampsia. In the same study, the rate of abruption was 37.5%, and the DIC rate was 25% in eclamptic patients, while placental abruption was 32% and DIC was 16% in HELLP syndrome (10). Another study conducted by Azman et al. reported that in patients with severe preeclampsia, the rate of detachment was 2.1%, DIC was 4.2%, and hemorrhage was 6.3%. In the same study, it was reported that detachment was encountered in 25% of eclamptic patients. It has been reported that DIC develops at a rate of 28.5%, and AKI develops at a rate of 14.2% in patients with HELLP syndrome (11). In a USA-based study, hypertensive diseases during pregnancy are responsible for 15% of pregnancy deaths and are reported to be the 2nd most common cause of maternal mortality (12). In Turkey, these diseases constitute 25% of maternal mortality and are among the top 3 most important causes (183). There was no maternal mortality event among the patients in our study.

In a study, early neonatal mortality rates in severe preeclampsia and eclampsia were 13% (13). In the study conducted by Azman et al., early neonatal death rates were reported as 28.5% among patients with HELLP syndrome and 4.3% among patients described as severe preeclampsia (11). As a result of our study, we detected early neonatal death and intrauterine death only in the preeclampsia group with severe features. We determined that the early neonatal death rate was 4.8% in this patient group, while the intrauterine death rate was 3.6%. We found that the rates of oligohydramnios, IUGR, and fetal distress, which we determined as perinatal complications, did not have any statistical significance between the patient groups—the 5th minute APGAR score was statistically significantly higher than the severe preeclampsia group.

In a study conducted by Sibai et al., it was reported that the rate of cesarean section in patients with HELLP syndrome varied between 63% and 96% (14). Some studies rate this as 40% in HELLP syndrome and 70% in preeclampsia and eclampsia patient groups (15). In the study conducted by Azman et al., the rate of birth by cesarean section was 68% in preeclampsia, 85.8% in HELLP syndrome, and 100% in eclampsia (11). In our study, we found the cesarean section rate to be 83% in the non-severe preeclampsia group, 95% in the severe patient group, and 100% in the HELLP syndrome and eclampsia groups. These high rates are due to our clinic serving as a tertiary health institute; therefore, many patients are in poor clinical and laboratory conditions.

None of the patients in the HELLP syndrome group had previously had a pregnancy with preeclampsia. In the eclampsia group, preeclampsia history was positive at a rate of 33.3%. We found that 12.2% of the total number of patients had a history of preeclampsia, 3.2% had a history of gestational hypertension, and 2.6% had a history of chronic hypertension. When the parameters were compared, no statistically significant difference was detected between patients with a history of hypertensive disease and the patient groups. Although it is stated in the literature that having a history of preeclampsia in your medical history increases the likelihood of preeclampsia occurring again, we did not detect a significant statistical difference in whether it affects the severity of the disease.

No statistically significant difference was detected when the patient groups were compared according to the methods of conception. We concluded that the method of conception did not affect disease severity. In our study, 25 patients (16%) required postpartum blood product transfusion. When the patient groups were compared with FFP and platelet transfusion practices, we found a significant statistical increase in the rate of receiving FFP and platelet transfusion in patients followed by a diagnosis of HELLP syndrome and eclampsia. We concluded that patients with these diagnoses should be followed more carefully, considering the need for FFP and platelet transfusion may develop. We found that the rates of erythrocyte transfusion requirement were high in the severe preeclampsia group (10.7%). Additionally, postpartum hemorrhage developed at the same rate in this group (10.7%). We concluded that these patients should be closely monitored for bleeding.

No statistically significant difference was detected between the patient groups regarding distribution when the patients were evaluated according to their nulliparity status. Therefore, we concluded that nulliparity cannot be used to determine disease severity. When the patient groups were compared by evaluating the duration of hospitalization, the group with the longest average hospitalization period was

the group diagnosed with HELLP syndrome. As a result of this evaluation, we concluded that close follow-up of this group of patients is necessary regarding maternal complications that prolong hospitalization. We determined that the minimum duration of hospitalization was in the eclampsia group that did not show severe features in accordance with their clinical condition. When premature birth rates in patients are compared, The premature birth rate was 27% (17 newborns) in the non-severe preeclampsia group, 73.8% (62 newborns) in the severe preeclampsia group, and 100% in the HELLP (6 newborns) and eclampsia (3 newborns) patient groups. When comparing the HELLP and eclampsia groups with the other groups, premature birth rates were found to be statistically significantly higher in the HELLP and eclampsia group ($p<0.05$).

When postpartum intensive care hospitalization needs were considered, we saw that 83.3% of patients diagnosed with HELLP syndrome and 66.7% of eclampsia patients required postpartum intensive care. Therefore, we concluded that these two patient groups' birth should be performed in an intensive care unit center. In addition, since it was observed that fetal weight and birth week data in these patient groups had lower values than other patient groups, we determined that perinatal mortality and morbidity should be predicted. The patients should be followed up and treated in appropriate centers. No statistically significant difference was found when comparing patient groups according to the patient's smoking status. Therefore, we concluded that smoking cannot be used as a parameter to determine disease severity.

CONCLUSION

As a result, hypertensive diseases of pregnancy are disorders with high rates of both fetal and maternal mortality and morbidity. The fact that no maternal mortality was detected in our clinic can be explained by the fact that our hospital is a tertiary-level hospital, we have a blood center for blood and blood products, and we have a 3rd level intensive care unit. Therefore, the results of our clinic support the need to follow pregnant women with hypertensive disease during pregnancy in hospitals with tertiary intensive care units and blood centers. The higher rate of maternal complications in patients with elevated AST and ALT suggests that follow-up of this patient group in the intensive care unit will be beneficial in reducing maternal morbidity and mortality. The high rate of premature birth in the severe preeclampsia, HELLP syndrome and eclampsia groups shows that hypertensive diseases of pregnancy are one of the important causes of premature birth today.

DESCRIPTIONS

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No conflict of interest.

Ethical Declaration: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from our institution. Informed consent was obtained from all participants.

Note: This study was produced from a thesis.

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