



Evaluation of HELLP Syndrome Cases in a Tertiary Education Hospital Intensive Care Service

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Abstract

Objective: HELLP syndrome is a complication of severe preclampsia and eclampsia with high perinatal morbidity and mortality. Hemolysis is characterized by a decrease in platelet count and an increase in liver enzymes. Cases may require follow-up in intensive care unit.

Material and Methods: We retrospectively reviewed 17 cases of HELLP Syndrome followed in the intensive care unit of Kartal Lutfi Kirdar Training and Research Hospital between 2010-2017.

Results: The mean values of days of hospitalization for HELLP syndrome were 6.1 ± 23 , age was 28.54 ± 4.61 years, APACHE II score was 13.15 ± 4.87 , Systolic Artery Pressure was 176.62 ± 31.31 mmHg and Diastolic Artery Pressure was $96, 46 \pm 16, 23$. The laboratory results were: hemoglobin; 10.0 ± 12.2 mg / dL, AST: 75.2 ± 19.9 IU / L, ALT: 83.7 ± 113.1 IU / L, urea: 44.0 ± 55.2 mg / dL, creatinine: $1,2 \pm 1,3$ mg / dL, LDH: 6130 ± 131 IU / L, platelet count: $114,500 \pm 68,500$ mm³, albumin: $2,32 \pm 0,51$ g / dL and bilirubin: $1,6 \pm 0, 6$ mg / dL. 11 patients received erythrocyte and 8 patients received platelet suspension. Mechanical ventilation was performed in 5 patients, hemodiafiltration in 2 patients and plasmapheresis in 1 patient. 3 patients lost their life because of multiple organ failure.

Conclusion: HELLP Syndrome is one of the leading obstetric causes of hospitalization in intensive care units and has high maternal morbidity and mortality. We think that the mortality and morbidity rate will be decreasing rapidly with early diagnosis and intensive care unit follow up.

Keywords: Intensive care, obstetric, HELLP syndrome.

Introduction

Preeclampsia is characterized by high blood pressure, edema and proteinuria in pregnancies and is the most serious disease of pregnancy⁽¹⁾. Increased vascular resistance, increased activity in the coagulation system, endothelium structural

disorder, and platelet aggregation are complications that lead to systemic inflammatory response⁽²⁾. HELLP (Hemolysis, Elevated Liver enzymes, Low Platelets) syndrome is considered to be a severe type of preeclampsia which is life-threatening, specific to human pregnancy, with

hemolysis, increase in liver enzyme values, decrease in platelet count⁽³⁾.

HELLP syndrome usually occurs in the third trimester of pregnancy, at a lower rate in early gestational weeks, or within the first 72 hours following birth. The cause is not exactly known; genetic predisposition, abnormal placental location, immunological pathologies, and maternal vascular endothelial dysfunction syndrome were thought to have role in the development of the syndrome⁽⁴⁾.

It has been reported that the prevalence rate in pregnant cases is 0.17-0.85%, in pregnant developing eclampsia it is 10.8% -32.1% and the maternal mortality rate is 3.5-24.2%⁽⁵⁾.

Since HELLP syndrome can lead to various perinatal and maternal complications, the cases need close follow-up as clinically with laboratory findings. In the cases; kidney failure, acid, pleural effusion, pulmonary edema, diffuse intravascular coagulation, prolonged wound healing, endometritis, liver hematoma, blindness and multiple organ failure may develop⁽⁶⁾. All cases with affection of two or more organ systems and requiring mechanical ventilator support should be monitored in intensive care unit⁽⁷⁾.

We aimed to evaluate the cases with HELLP syndrome treated in intensive care unit retrospectively according to demographic features, laboratory findings, treatment, complications, and prognosis.

Materials and Methods

We evaluated retrospectively 17 HELLP cases who were followed up at the intensive care unit of Kartal Lutfi Kirdar Training and Research Hospital between January 2010 and January 2017. In cases of HELLP syndrome the diagnosis of the syndrome was maintained by hemolysis, high LDH (> 600 IU / L), elevated bilirubin value (> 1.2 mg / dl), high liver enzymes AST> 70 IU / L (aspartate amino transferase), ALT> 70 IU / transferase) and low platelet count (<150000 / mm³)⁽⁸⁾. Serum ALT, AST, creatinine, urea, albumin, LDH, bilirubin and hemoglobin values,

prothrombin time (PT), partial thromboplastin time (PTT) and fibrinogen level and platelet count were recorded.

We evaluated the age of the cases, indications for receiving intensive care, the duration of ICU admission, APACHE II (Acute Physiology and Chronic Health Evaluation) scores calculated in the first 24 hours⁽⁹⁾, applied treatment modalities, duration of mechanical ventilation, and mortality reasons.

Statistical analysis was performed in the SPSS 18.00 program. Data were presented as number (n) or mean \pm standard deviation (SD).

Results

In these 17 cases; the mean age was 28.54 ± 4.61 years (21 years-38 years), and the mean duration of pregnancy was 33.2 ± 2.5 weeks (27 weeks-39 weeks). 8 cases (47%) were nulliparous, 7 cases (41%) were multiparous, 2 cases (12%) were primiparous, 12 cases (71%) were cesarean and 5 cases (29%) were vaginal deliveries (Table 1).

The reason for intensive care of patients with HELLP syndrome were convulsions in 8 cases, airway control in 4 cases, invasive hemodynamic monitoring in 3 cases, diffuse intravascular coagulation in 1 case and intracerebral hemorrhage in 1 case.

In the intensive care unit, the mean duration of hospitalization was 6.5 ± 2.2 days (4 days - 32 days) and the mean first 24 hours APACHE II score was $13,4 \pm 5,56$ (8-20). Five patients required mechanical ventilation and the mean duration of mechanical ventilation was 6 ± 3.74 (4 days to 8 days) (Table 1).

In evaluating the mean laboratory values of the cases; hemoglobin; 10.12 ± 2.3 mg / dl, AST: 78.2 ± 18.3 IU / L (162 IU / L -57082 IU / L), ALT: 84.7 ± 111.5 IU / L, LDL: 1015 ± 115 IU / L (1145 IU / L-10140 IU / L), bilirubin: 1.4 ± 1.5 mg / dL, creatinine 1.2 ± 1.2 mg / L was found to be ± 0.6 mg / dl, platelets 83.550 ± 62.500 / mm³ (27000 / mm³ -65000 / mm³) and lactate 11.5 mmol / L (2.6 mmol / L-28 mmol / L) (Table 2).

Twelve patients were treated with antihypertensive treatment, eleven patients were given erythrocyte suspension, eight patients were given thrombocyte suspension, and three patients did not require transfusion. Two patients were treated with plasmapheresis due to refractory thrombocytopenia and two patients underwent hemodiafiltration.

It was determined that the two patients who developed DIC (Disseminated Intravascular Coagulation) and ARDS (Acute Respiratory Distress Syndrome) lost their life after multiorgan failure (Table 3).

Table 1. Age, gestational week, APACHE II scores, hospitalization days and duration of mechanical ventilation of the patients

	Minimum	Maximum	Mean \pm SD*
Age (year)	21	38	28,54 \pm 4,61
Length of hospitalization (day)	6	14	6.5 \pm 2.25
APACHE II	8	20	13.4 \pm 5.56
Parity	1	4	1.95 \pm 0.89
Gestational week (week)	27	39	33.1 \pm 2.43
Length of mechanical ventilation (day)	4	8	6 \pm 3.74

*Mean \pm Standard Deviasyon

Table 2. The mean laboratory values of the cases

Value	Mean \pm SD*
Systolic blood pressure (mmHg)	176,62 \pm 31,31
Diastolic blood pressure (mmHg)	96,46 \pm 16,23
ALT(IU/L)	84.7 \pm 111.5
AST(IU/L)	78.2 \pm 18.3
Urea (mg/dl)	43.0 \pm 51.6
Creatinine (mg/dl)	1.2 \pm 1.2
LDH(IU/L)	1015 \pm 115
Bilirubin (mg/dl)	1.4 \pm 0.6
Hemoglobin(mg/dl)	10.12 \pm 2.3
Thrombocyte (/mm ³)	83.550 \pm 62.500
Lactate (mmol/L)	10,5

*Mean \pm Standard Deviasyon

Table 3: Complications in patients with the HELLP syndrome

Maternal Complications	N
Demand of transfusion of blood and blood products	12
Acute renal failure	5
Pulmonary edema	5
DIC	4
Acute respiratory distres syndrome	3
Maternal death	2
Intracranial bleeding	1
Sepsis	1

Discussion

HELLP syndrome is a serious pregnancy complication characterized by microangiopathic hemolytic anemia, hepatic dysfunction, thrombocytopenia. It is thought to have been the result of triggering the maternal systemic inflammatory response, which may affect different systems, cause maternal and fetal mortality⁽¹⁰⁾.

It is observed in 0.1% -0.85% of all pregnancies and 13-65% of them develop complications⁽¹¹⁾.

The defining feature of the syndrome is hemolysis due to microangiopathic hemolytic anemia. Endothelial dysfunction, erythrocyte fragmentation, intimal damage, and fibrin accumulation in small vessels resulting in an inflammatory response are responsible for the hemolysis. The

resulting erythrocyte damage leads to an increase in lactic dehydrogenase and a decrease in hemoglobin levels. LDH and bilirubin levels were high in all cases treated in the study to confirm HELLP syndrome.

The majority of patients with a diagnosis of HELLP syndrome has been reported to be multiparous^(12,13). In our study, multipara case rate was found as 47%.

Hemolysis is one of the major features of HELLP syndrome and depends on the microangiopathic hemolytic anemia. Red cell fragmentation caused by the high flow through the injured endothelium, intimal damage, endothelial dysfunction and fibrin accumulation were thought to reflect the size of the retained small blood vessels. Hemolysis and destruction of red blood cells cause reduction of serum lactate dehydrogenase (LDH) level and decrease of hemoglobin concentration.

There were various increases in liver enzymes of our cases in accordance with the literature. Ditisheim et al. found an average ALT of 123 ± 164 IU / L and a mean AST of 179 ± 344 IU / L in their study, and reported that the degree of increase in the enzymes was related to the severity of the syndrome⁽¹³⁾. Thrombocytopenia is the most common finding in many cases⁽¹⁴⁾. A decrease in the number of platelets developed in HELLP syndrome is the result of an increase in platelet destruction⁽¹⁵⁾. Increase in platelet activation and adhesion subsequent to vascular endothelial dysfunction leads shortening the life of to platelets.

The effect of treating women with HELLP syndrome using corticosteroids (which can reduce inflammation). The results of this review did not indicate that there was a clear effect on the health of pregnant women when treated with corticosteroids, or their babies. Corticosteroids did appear to improve some components of the women's blood tests, but it is not clear that this had an effect on their overall health. The use of corticosteroids may be justified in clinical situations in which increased rate of recovery in

platelet count is considered clinically worthwhile⁽¹⁶⁾.

The mean platelet level in our study was 68000 / mm³. In 5% of the patients, the platelet count was ≥ 100.000 mm³, between 50.000 and 100.000 mm³ in 40%, and ≤ 50.000 mm³ in 55%.

In HELLP syndrome, complications occur in 13-65% of cases. The most common complication is blood transfusion requirement, diffuse intravascular coagulation, acute renal failure and ARDS. In addition, hepatic hematoma and rupture, hepatic infarction, pulmonary edema, retinal detachment and sepsis may be observed⁽¹⁷⁾. The most common complication in our study was blood and blood product transfusion requirement and we transfused erythrocyte suspension in eleven cases (64.7%) and platelet suspension in 8 cases (47.1%).

Two of our patients developed acute renal failure, both of which underwent hemodiafiltration. One of the patients who underwent hemodiafiltration returned to normal renal function, the other developed ARDS and the patient lost his / her life due to MOF. It has been reported that in patients with HELLP syndrome, renal failure increases the mortality by four times⁽¹⁸⁾.

One of the important factors affecting mortality in patients with HELLP syndrome is the need for mechanical ventilation and intensive care. Osmanağaoğlu et al.⁽¹⁹⁾ reported that mechanical ventilation was required in 30% of patients and Murray et al.⁽²⁰⁾ required mechanical ventilation in 70% of cases in 20 patients. In our study, in the course of treatment; 2 patients underwent mechanical ventilation, 1 patient underwent plasma exchange to reduce circulating immunocomplexes.

Since the pathophysiology of the disease has not been clarified yet, there is no definite treatment protocol. According to the literature, maternal mortality ranges from 1% to 25%. In the study of Martin et al., This rate was reported as 3.2% in HELLP syndrome cases⁽²¹⁾. In our study, the mortality rate was found as 12%. Providing early diagnosis, appropriate treatment, and intensive

care conditions are important in reducing the mortality related to the development of complications.

The main limitations of our study are the retrospective design and the small number of patients in the study.

Conclusion

In HELLP syndrome; at first, pregnancy should be terminated⁽²²⁾. It should be kept in mind that HELLP syndrome, which has no established treatment, is a sudden and rapidly deteriorating clinical picture. Mortality and morbidity should be tried to be reduced by early diagnosis, coordination of gynecology and intensive care units, monitoring of cases in multidisciplinary intensive care unit and mechanical ventilation if necessary.

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