



# Outcome of Patients Admitted to Obstetric Intensive Care Unit With Severe Preeclampsia, Eclampsia or HELLP Syndrome

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## Abstract

**Objectives:** Hypertensive disorders of pregnancy are associated with maternal mortality and morbidity. Patients with these diseases usually require intensive care. This study reviewed pregnant women with severe preeclampsia, eclampsia or HELLP syndrome who needed intensive care and were consequently admitted to intensive care unit (ICU).

**Materials and Methods:** In this retrospective study, data of all preeclamptic and eclamptic women and patients with HELLP syndrome who delivered at Al-Zahra hospital over a 1-year period from March 2012 to March 2013 were reviewed.

**Results:** Of 9812 women delivered in our center, 56 women with severe hypertensive disorders required ICU admission (0.6%). The most common therapeutic interventions included vasodilator agents and transfusion. No case of maternal mortality was reported; while 5 cases of fetal death (8.9%) due to intrauterine death were reported.

**Conclusion:** Outcome of patients admitted in ICU for severe hypertensive disorders of pregnancy is generally good. Intensive care management should be considered in every referral obstetric center.

**Keywords:** Intensive care unit, Maternal death, Preeclampsia, Pregnancy, Perinatal death

## Introduction

Preeclampsia is a relatively common hypertensive disorder during pregnancy. Preeclampsia occurs in about 5%-15% of all pregnant women, may cause dangerous complication and even death in the mother and fetus (1). In 5% of all cases, preeclampsia can progress toward eclampsia, and up to 19% of the cases present with HELLP syndrome, maternal and perinatal mortality can be increased (2).

Severe preeclampsia and its associated complications are considered as the leading main indications for intensive care unit (ICU) admission (3-7). The most common indications for admission to the ICU of patients with pregnancy-induced hypertension include but are not limited to refractory hypertension, neurological dysfunction (intracranial hemorrhage, seizures, and elevated intracranial pressure), liver or kidney dysfunction, pulmonary edema, HELLP syndrome, and/or disseminated intravascular coagulation (DIC) (2,8-10).

There are several studies of critically ill obstetric patients, but little has been studied on the maternal and perinatal outcomes of patients with preeclampsia, eclampsia or HELLP syndrome (2,11). The aim of the present retrospective study was to evaluate the frequency, indications, interventions and clinical outcomes of patients with severe preeclampsia, eclampsia, and HELLP syndrome

admitted to the ICU.

## Materials and Methods

After obtaining the written approval of the ethical committee of hospital, this study was conducted. Records of all preeclamptic and eclamptic patients and pregnancy conditions indicating HELLP syndrome which needed intensive care in Al-Zahra hospital, Tabriz University of Medical Sciences were reviewed retrospectively within 1-year from March 2012 to March 2013. Studied data included clinical epidemiological variables, laboratory test parameters, diagnostic and therapeutic interventions, rate of morbidity and mortality and its related factors, and the average duration of ICU stay.

Descriptive statistics were used for categorical data as frequency (n) or percentage (%) and for continuous parameters as mean  $\pm$  SD, or as median range on the presence or absence of a normal data distribution. Categorical variables were analyzed by chi-square test or Fisher exact test, as appropriate. SPSS 16 was used for data analysis.

## Results

In this study, 35 (62.5%) women with severe preeclampsia, 2 (3.5%) women with eclampsia and 19 (34%) patients with HELLP syndrome were studied. Total number of

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deliveries during the period of study was 9812 of which 56 (6/10000) had been admitted to our ICU due to pre-eclampsia, eclampsia or HELLP syndrome. Frequency of maternal hypertensive disorders admitted to the ICU was 45% of all maternal ICU admissions in our setting, followed by peripartum hemorrhage (31%) and pulmonary thromboembolism (PTE) (24%).

Demographic characteristics of the subjects and clinical and laboratory test data on ICU admission have been listed in Table 1. Mean age of the patients was 29.36±5.30 (range 23-41) years. The mean gestational age at the time of hospitalization was 36.7±5.2 (range 26-40) weeks. There were 24 (42.8%) nuliparus and 32 (57.2%) multiparus in our study. Of 56 patients admitted to ICU, 5 had been admitted antenatally and 51 postnatally. In our study, all of the patients underwent cesarean section under spinal (60.7%) or general (39.3%) anesthesia. Fifteen (26.8%) patients had body mass index (BMI)>30.

The median period of ICU stay was 3 (range 2-7) days. Ten (18.8%) patients had preexisting medical illnesses including 1 diabetes mellitus, 1 cardiac disease, 3 renal disease, 1 bronchial asthma and 2 hematologic disorders (idiopathic thrombocytopenic purpura [ITP] and thrombotic thrombocytopenic purpura [TTP]). Two (3.5%) patients had history of preeclampsia in their previous pregnancies. Table 2 presents diagnostic or therapeutic interventions in the ICU. Blood transfusion was required in 4 (7%) patients with HELLP diagnoses. The most frequently used treatment was vasodilators.

Patients' complications of stay in ICU are illustrated in Table 3. Pregnancy-related complications or their risk factors occurred in 10 (17.8%) patients. Anesthetic complications accounted in 2 (3.5%) patients, following pulmonary edema due to intraoperative over infusion of fluids. No maternal death occurred in our setting due to preeclampsia.

**Table 1.** Demographic, Clinical, and Laboratory Test Data at the Time of Hospitalization

Parameter	Values
Age (y)	29.36 ±5.3
Gestational age (wk)	36.5±5.2
Body mass index (BMI)>30 (n)	15 (26.8)
Nuliparus/multiparus (n)	24 (42.8)/32(57.2)
Preeclampsia/eclampsia/HELLP (n)	35(62.5)/2(3.5)/19(34)
Systolic blood pressure (mm Hg)	165.8 (135-200)
Diastolic blood pressure (mm Hg)	107.5 (85-140)
Hemoglobin (g/dl)	11.3 (9.8-15.4)
Platelet count (n/mm <sup>3</sup> )	103000 (47000-185000)
Aspartate aminotransferase (SGOT) (u)	99 (21-350)
Alanine transaminase (SGPT) (u)	86 (11-357)
Fibrinogen (mg/dl)	292.7 (229-344)
Blood urea nitrogen (BuN)(mg/dl)	26.7 (18-35)
Creatinine (Cr) (mg/dl)	0.85 (0.7-1)

Data are expressed as mean±SD or median (range) or number (%).

tic complications throughout the study period. Perinatal mortality was observed in 5 (8.9%) cases which were all due to intrauterine death. There was no neonatal death in any of the studied women; while intrauterine growth retardation was the most common fetal complication (in 11 patients).

## Discussion

Severe pregnancy induced hypertension is a disorder which is now treated in ICU. A better knowledge of the pathophysiology of preeclampsia allows for better and more effective management of these patients (1).

As with other reports, hypertensive disorders of pregnancy with their varying single or multiple organ system involvement are one of the main causes of ICU admission (2-6). In the present study, preeclampsia, eclampsia and HELLP syndrome were the major causes for maternal ICU admission in our hospital in 0.6% of all deliveries. This is comparable to the rate of 0.4%-2.4% reported by other authors (2-6). The mean age of patients and gestational age at the time of hospitalization were similar to previous studies (2,4,7).

Pregnancy-induced hypertension is a common cause of maternal morbidity and mortality, especially in developing countries (2,7-10). There was no maternal mortality throughout the study period following hypertensive dis-

**Table 2.** Diagnostic and Therapeutic Interventions in ICU

Intervention	No. (%)
Arterial line	5 (8.9)
Central vein line	2 (3.5)
Transfusion	4 (7.1)
Mechanical Ventilation	1 (1.7)
Intravenous drugs	
Vasodilators	22 (39.2)
Furosemide	11 (19.6)
Arterial blood gases(ABG)	7 (12.5)
Hysterectomy	2 (3.5)
Hysterotomy	5 (8.9)
Hemodialysis	0 (0.0)

Data are expressed number (%).

**Table 3.** Patient's Complications of Stay in ICU

Complications	No. (%)
Refractory hypertension	46 (82.1)
Pulmonary edema	2 (3.5)
Seizure	4 (7.1)
Heart failure	0 (0.0)
Acute tubular necrosis (ATN)	0 (0.0)
Maternal death	0 (0.0)
Fetal/neonatal death	5 (8.9)/0 (0)

Data are expressed number (%).

orders of pregnancy. Curiel-Balsera et al (2) and Quah et al (8) reported 1.5% and 1.3% maternal mortality in their settings, respectively. This difference may be following to low period of our study. However, Tuffnell et al (11) reported no maternal death in their setting during a 4 years study period. In addition, current overall incidence in developed world is low varying from 0.2-0.4 per thousand (2,12). The rate in developing countries is as high as 10% of the deliveries (2). A high incidence (21.4%) of maternal death among preeclamptic women was reported in the study of Souza et al (10). Most admitted patients were those at their postpartum period. Other studies also show that majority (>80%) of postpartum patients were admitted to the ICU (2,9).

Approximately, 7.1% of the cases with coagulation problems had blood products transfusion. There were no neonatal death in any women and intrauterine complications occurred in 11 (19.6%) patients. Similar to other studies (2,10,11), the common problems include refractory hypertension, pulmonary edema, heart failure, seizer, and coagulopathy. Nitroglycerine was the main antihypertensive drug therapy in patients who did not respond to oral medications. One patient in this study had intermittent positive pressure ventilation (IPPV) for 24 hours for respiratory support due to pulmonary edema. Other interventions in our setting were similar to other studies (2,8,11). The median period of stay in ICU was 3 days. This period was similar to the study of Orsini et al. (3). The patients with complications showed a longer stay in the ICU (5-7 days).

### Conclusion

The present study reveals that severe preeclampsia, eclampsia and HELLP syndrome are the diagnoses most commonly requiring ICU admission. Although in our study no maternal mortality was reported, it can be associated with some complications. To reduce maternal morbidity and mortality, these patients require early admission and management in the ICU is appropriate. Efforts to prevent and detect complications that can occur due to preeclampsia are important.

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### Conflict of Interests

The authors declare no conflict of interests.

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