

# PREGNANCY OUTCOMES IN WOMEN WITH SEVERE PREECLAMPSIA AND ECLAMPSIA AT ADMISSION AT THE NATIONAL HOSPITAL OF OBSTETRICS AND GYNECOLOGY: A CROSS-SECTIONAL STUDY

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## ABSTRACT

**Objectives:** To describe the characteristics and pregnancy outcomes of women diagnosed with severe preeclampsia and eclampsia who were admitted for emergency care at the National Hospital of Obstetrics and Gynecology.

**Subjects and methods:** A cross-sectional descriptive study was conducted on 115 pregnant women diagnosed with severe preeclampsia or eclampsia who presented to the Emergency Department of the National Hospital of Obstetrics and Gynecology between June 2024 and March 2025.

**Results:** The mean age of participants was  $32.07 \pm 6.9$  years, with 38.3% aged 35 years or older. Clinical symptoms included edema (87.8%), blurred vision (14.8%), and headache (27%). At admission, 28.7% of women had stage 1 hypertension, 44.3% had stage 2 hypertension, and 25.2% had stage 3 hypertension. Severe preeclampsia accounted for 97.4% of cases, while 2.6% were diagnosed with eclampsia. HELLP syndrome was observed in 10.4% of patients, placental abruption in 0.9%, and 2.6% experienced other complications such as acute renal failure, pleural effusion, or coexisting Basedow's disease. Regarding management, 99.1% of women underwent cesarean section, and 4.3% required referral to another facility. A total of 90.4% were treated with two or more antihypertensive medications, and 63.2% received intravenous magnesium sulfate (15%) for seizure prophylaxis. Following treatment and postpartum care, 95.7% of patients were discharged in stable condition. The mean gestational age at delivery was  $33 \pm 2.9$  the mean neonatal birth weight was  $1680 \pm 680.4$  grams. The live birth rate was 97.5%.

**Conclusion:** Edema, headache, and blurred vision were the most common presenting symptoms among women with severe preeclampsia and eclampsia. The vast majority of cases were diagnosed as severe preeclampsia, and elective cesarean section was the predominant mode of delivery. Maternal outcomes were generally favorable, with most patients discharged in stable condition and a high fetal survival rate observed. These results underscore the importance of early recognition and timely management of preeclampsia and eclampsia to improve maternal and perinatal outcomes.

**Keywords:** Severe pre-eclampsia, eclampsia.

## 1. INTRODUCTION

Preeclampsia and eclampsia are common pregnancy-related disorders. According to the World Health Organization, these conditions occur in approximately 2–10% of all pregnancies [1]. They can lead to severe maternal and fetus complications, such as intrauterine growth

restriction, placental abruption, HELLP syndrome, and are among the leading causes of maternal and perinatal mortality worldwide. Due to the unclear pathogenesis of the disease, prevention, screening, and treatment of preeclampsia and eclampsia remain major challenges.

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Preeclampsia is characterized as a pregnancy-specific disorder with hypertension typically developing after 20 weeks of gestation. Reported risk factors include advanced maternal age, chronic hypertension, diabetes mellitus, renal disease, obesity, hypercoagulable states (antiphospholipid syndrome), first-time exposure to trophoblastic cells (primigravida), or excessive trophoblastic exposure (multiple pregnancy, hydatidiform mole) and a history of preeclampsia in previous pregnancies.

The National Hospital of Obstetrics and Gynecology is a leading tertiary referral center that annually manages numerous complex cases of preeclampsia and eclampsia, many of which associated with severe complications. Therefore, early detection and timely management of these conditions is critically important and remains one of the hospital's core objectives. To provide additional evidence for improving the management of preeclampsia and eclampsia, this study aims to describe the characteristics and pregnancy outcomes of women diagnosed with severe preeclampsia and eclampsia who were admitted for emergency care at the National Hospital of Obstetrics and Gynecology.

## 2. MATERIALS AND METHODS

This study was conducted from June 2024 to March 2025 at the Emergency Department, Department of Medical Examination, National Hospital of Obstetrics and Gynecology (NHOG), Hanoi, Vietnam.

### 2.1. Participants

The study population comprised pregnant women diagnosed with severe preeclampsia or eclampsia who presented to the Emergency Department of NHOG during the study period. The inclusion criteria: Pregnant women with singleton or multiple viable pregnancies, Diagnosis of severe preeclampsia or eclampsia based on clinical assessment, paraclinical investigations, and biochemical markers in accordance with NHOG diagnostic protocols, and Provided written informed consent to participate in the study.

The exclusion criteria: Women with miscarriage or intrauterine fetal demise due to causes unrelated to preeclampsia, eclampsia, or their complications, Women with alternative causes of seizures, such as epilepsy, hypocalcemia, or psychogenic disorders (e.g., hysteria), or Declined to participate in the study.

### 2.2. Study Design

This was a descriptive cross-sectional study. All

eligible pregnant women presenting with severe preeclampsia or eclampsia to the Emergency Department of NHOG during the study period were included. A total sample and convenience sampling approach were employed to include all eligible cases.

### 2.3. Data Collection and Analysis

Data were collected on sociodemographic characteristics, obstetric and medical history, clinical manifestations, paraclinical findings, diagnosis, treatment modalities, and maternal and neonatal outcomes. Data were collected using a standardized, pretested questionnaire and by reviewing patient medical records. All data were anonymized, coded, and entered into SPSS software version 20.0 for statistical analysis. Descriptive statistics were used to summarize the data, and appropriate analytical methods were applied to examine clinical characteristics and outcomes.

### 2.4. Ethical considerations

The study was approved by the Board of Directors of the National Hospital of Obstetrics and Gynecology and complied with the ethical regulations for medical research as stipulated by the Ministry of Health. Patient information was kept confidential in accordance with regulations, and the study results were used solely for the purpose of understanding the current situation, improving, and enhancing diagnostic and treatment procedures to benefit reproductive healthcare services, without any other intended purpose.

## 3. RESULTS

Between June 2024 and March 2025, 115 pregnant women diagnosed with severe preeclampsia or eclampsia were enrolled in a prospective cross-sectional study conducted at the Emergency Department of the National Hospital of Obstetrics and Gynecology.

### 3.1. Participant's Baseline Characteristics

Table 1. Participant's Baseline Characteristics

| Characteristic       |                               | Value (n = 115) |      |
|----------------------|-------------------------------|-----------------|------|
|                      |                               | n               | %    |
| Maternal age (years) | < 20                          | 5               | 4.3  |
|                      | 20-34                         | 66              | 57.4 |
|                      | >34                           | 44              | 38.3 |
|                      | Mean age ( $\bar{X} \pm SD$ ) | 32.07 ± 6.9     |      |

| Characteristic                  |   | Value (n = 115) |      |
|---------------------------------|---|-----------------|------|
|                                 |   | n               | %    |
| Ethnicity                       | Kinh  | 94              | 81.7 |
|                                 | Other ethnic groups                               | 21              | 18.3 |
| Place of residence              | Urban   | 43              | 37.4 |
|                                 | Rural   | 56              | 48.7 |
|                                 | Mountainous areas                                 | 16              | 13.9 |
| Gravidity                       | Nulligravida                                      | 27              | 23.5 |
|                                 | Gravida 1-2                                       | 64              | 55.7 |
|                                 | Gravida > 2                                       | 24              | 20.9 |
| Conception method               | Spontaneous                                       | 89              | 77.4 |
|                                 | Assisted reproductive techniques                  | 26              | 22.6 |
| Number of fetuses               | Singleton   | 106             | 92.2 |
|                                 | Multiple  | 9               | 7.8  |
| Medical history (Comorbidities) | Family history of preeclampsia (mother or sister) | 3               | 2.6  |
|                                 | Chronic kidney disease                            | 2               | 1.7  |
|                                 | Chronic hypertension                              | 19              | 16.5 |
|                                 | Type 1 or Type 2 diabetes mellitus                | 4               | 3.5  |
| Obstetric history               | Previous delivery of a growth-restricted infant   | 11              | 9.6  |
|                                 | History of recurrent preeclampsia                 | 11              | 9.6  |

The mean maternal age was 32.07 ± 6.9 years, with the majority of participants (57.4%) falling within the 20–34 age group. Most women were of Kinh ethnicity (81.7%) and resided in rural areas (48.7%). In terms of reproductive history, 55.7% had experienced one to two prior pregnancies, 77.4% conceived spontaneously, and 92.2% were carrying singleton pregnancies. The prevalence of underlying medical conditions was relatively low; however, chronic hypertension was the most frequently reported comorbidity, affecting 16.5% of participants. Regarding obstetric history, 9.6% had previously delivered infants with intrauterine growth restriction, and an equal proportion reported a history of recurrent preeclampsia, particularly in

association with early-onset and extreme preterm birth.

### 3.2. Clinical and Subclinical Characteristics of the Participants

**Table 2. Clinical and Subclinical Characteristics of the Participants**

| Features  | Number & Rate (N=115) |      |
|---|-----------------------|------|
|   | n                     | %    |
| <b>Edema</b>                                    |                       |      |
| Yes   | 101                   | 87.8 |
| No  | 14                    | 12.2 |
| <b>Blurred vision</b>                           |                       |      |
| Yes   | 17                    | 14.8 |
| No  | 98                    | 85.2 |
| <b>Epigastric pain</b>                          |                       |      |
| Yes   | 3                     | 2.6  |
| No  | 112                   | 97.4 |
| <b>Headache</b>                                 |                       |      |
| Yes   | 31                    | 27.0 |
| No  | 84                    | 73.0 |
| <b>Blood Pressure (mmHg)</b>                    |                       |      |
| Normal  | 2                     | 1.7  |
| Hypertension stage 1 - (140-159 and/or 90-99)   | 33                    | 28.7 |
| Hypertension stage 2 - (160-179 and/or 100-109) | 51                    | 44.3 |
| Hypertension stage 3 - (≥ 180 and/or ≥ 110)     | 29                    | 25.2 |

Edema was the most commonly reported symptom, observed in 87.8% of participants, followed by headache (27%), blurred vision (14.8%), and epigastric pain (2.6%). The majority of women (44.3%) presented with grade 2 hypertension or higher at the time of admission.

**Table 3. Laboratory Parameters of Participants**

| Parameter   |             | Number & Rate (N=115) |      |
|-------------|-------------|-----------------------|------|
|             |             | n                     | %    |
| AST         | <35 U/L     | 71                    | 61.7 |
|             | ≥35 U/L     | 44                    | 38.3 |
| ALT         | <35 U/L     | 87                    | 75.7 |
|             | ≥35 U/L     | 28                    | 24.3 |
| Ure         | ≤7.5mmol/L  | 87                    | 75.7 |
|             | >7.5 mmol/L | 28                    | 24.3 |
| Creatinin   | ≤106 μmol/L | 105                   | 91.3 |
|             | >106 μmol/L | 10                    | 8.7  |
| Acid Uric   | ≤420 μmol/L | 38                    | 33.0 |
|             | >420 μmol/L | 77                    | 67.0 |
| PLT         | <100 G/l    | 13                    | 11.3 |
|             | ≥100 G/l    | 102                   | 88.7 |
| Albumin     | <25g/l      | 13                    | 11.3 |
|             | ≥25g/l      | 102                   | 88.7 |
| Proteinuria | <0.5 g/l    | 4                     | 3.5  |
|             | ≥0.5 g/l    | 111                   | 96.5 |
| LDH         | <247 IU/l   | 59                    | 51.3 |
|             | ≥247 IU/l   | 56                    | 48.7 |
|             | ≥0.2%       | 50                    | 43.5 |

Most participants had paraclinical test results within normal limits. However, elevated levels of serum uric acid and proteinuria were observed in a considerable proportion of patients, accounting for 67% and 96.5%, respectively.

**3.3. Diagnosis of Severe Preeclampsia, Eclampsia, and Associated Complications**

**Table 4. Complications and diagnostic features of severe preeclampsia and eclampsia in the study group**

| Diagnosis and complications of severe preeclampsia and eclampsia | Number & Rate (N=115) |       |
|--|-----------------------|-------|
|  | n                     | %     |
| <b>Severe preeclampsia and eclampsia</b>                         |                       |       |
| Severe preeclampsia  | 112                   | 97.4% |
| Eclampsia  | 3                     | 2.6%  |

| Diagnosis and complications of severe preeclampsia and eclampsia | Number & Rate (N=115) |      |
|--|-----------------------|------|
|  | n                     | %    |
| <b>Complications</b>   | 16                    | 13.9 |
| HELLP syndrome   | 12                    | 10.4 |
| Placental abruption  | 1                     | 0.9  |
| Others   | 3                     | 2.6  |

Of the study population, 97.4% were diagnosed with severe preeclampsia, while 2.6% presented with eclampsia. Overall, 13.9% of participants experienced complications related to these conditions. HELLP syndrome was the most frequently observed complication, occurring in 10.4% of cases, followed by placental abruption in 0.9%. Additionally, 2.6% of participants developed other serious complications, including acute kidney injury, pleural effusion, and Basedow's disease.

**3.4. Management and pregnancy outcomes**

**Table 5. Management and Pregnancy outcomes of women with severe preeclampsia and eclampsia**

| Features   | Number & Rate (N=115) |      |
|--|-----------------------|------|
|  | n                     | %    |
| <b>Mean duration of pre-delivery management (mean±SD) (days)</b> | 6.37 ± 3.6            |      |
| <b>Elective cesarean section</b>                                 |                       |      |
| Yes  | 114                   | 99.1 |
| No   | 1                     | 0.9  |
| <b>Use of antihypertensive medications</b>                       |                       |      |
| Used ≥ 2 antihypertensive agents                                 | 103                   | 90.4 |
| Used < 2 antihypertensive agents                                 | 11                    | 9.6  |
| <b>Seizure Prophylaxis with 15% magnesium sulfate</b>            |                       |      |
| Yes  | 72                    | 63.2 |
| No   | 42                    | 36.8 |
| <b>Maternal treatment outcomes</b>                               |                       |      |
| Discharged in stable condition                                   | 110                   | 95.7 |
| Intensive care treatment (referred to higher-level facility)     | 5                     | 4.3  |

| Features   | Number & Rate (N=115) |      |
|--|-----------------------|------|
|  | n                     | %    |
| <b>Fetal outcomes (N=122)</b>                          |                       |      |
| Survived   | 119                   | 97.5 |
| Died   | 3                     | 2.5  |
| <b>Gestational age at the time of delivery (weeks)</b> | 33 ± 2.9              |      |
| <b>Birth weight</b>                                    | 1680 ± 680.4          |      |

A total of 99.1% of pregnant women received treatment for severe preeclampsia or eclampsia, with a mean treatment duration of  $6.37 \pm 3.6$  days. Elective cesarean section was performed in 99.1% of cases. During the course of treatment, 90.4% of patients required two or more antihypertensive agents, and 63.2% received 15% magnesium sulfate for seizure prophylaxis.

The majority of patients (95.7%) were discharged in stable condition, while 4.3% required referral for intensive care management. The fetal survival rate was 97.5%. The mean gestational age at the time of cesarean delivery was  $33.1 \pm 2.9$  weeks, and the average neonatal birth weight was  $1,680 \pm 680.4$  grams..

## 4. DISCUSSION

### 4.1. Baseline Characteristics of Participants

The mean maternal age was  $32.07 \pm 6.9$  years, with the 20–34 age group accounting for the highest proportion (57.4%), which is consistent with findings from previous studies conducted at Ha Dong General Hospital (2019–2020) [2] and Hanoi Obstetrics and Gynecology Hospital in 2022 [3]. This is likely because preeclampsia is a pregnancy-related disorder that predominantly affects women of reproductive age.

Notably, the proportion of pregnant women aged  $\geq 35$  years with preeclampsia was 38.3%, reflecting an increasing trend in recent years. This suggests that delayed childbearing may significantly increase the risk of preeclampsia.

Most patients with severe preeclampsia and eclampsia had no known pre-existing medical conditions. Among those with underlying diseases, chronic hypertension was the most common (16.5%). The proportions of patients with a family history of preeclampsia (2.6%), chronic kidney disease (1.7%), and diabetes mellitus (3.5%) were all lower than those reported in studies at Hanoi Obstetrics and Gynecology Hospital [3] and Bach Mai Hospital [4].

### 4.2. Clinical and Laboratory characteristics of the study population

#### 4.2.1. Characteristics of clinical symptoms

Edema was the most frequently observed clinical sign, present in 87.8% of participants. This rate is comparable to findings from Bach Mai Hospital (89%) [4], but higher than those reported at Hanoi Obstetrics and Gynecology Hospital (81.3%) [3] and Ha Dong General Hospital (57.1%) [2]. Consistent with the 2019 study conducted at Can Tho Central General Hospital [5], our findings also identified other common symptoms among women with severe preeclampsia and eclampsia, including headache (27%), blurred vision (14.8%), and epigastric pain (2.6%).

The majority of patients presented with moderate to severe hypertension. Specifically, 44.3% had grade 2 hypertension and 25.2% had grade 3 hypertension. These proportions are significantly higher than those reported in the Bach Mai Hospital study (26%) [4] and slightly exceed those found in the Can Tho Central General Hospital study (44.04%) [5].

#### 4.2.2. Characteristics of Laboratory Parameters

Although paraclinical indices are not specific, they play a crucial role in indicating significant target organ damage. Our study showed that elevated serum uric acid was observed in 67% of cases, and proteinuria in 96.5%—both higher than the rates reported in the 2022 study at Hanoi Obstetrics and Gynecology Hospital (51% and 74%, respectively) [3]. These parameters are considered important predictors of maternal and fetal complications in preeclampsia.

### 4.3. Diagnosis of Severe Preeclampsia, Eclampsia, and Related Complications

The proportion of pregnant women diagnosed with severe preeclampsia was 97.4%, and eclampsia was 2.6%, which is higher than the rate reported in the 2016–2017 study at Can Tho Central General Hospital (69.6%) [6]. A total of 13.9% of patients experienced complications related to severe preeclampsia or eclampsia. Among them, 10.4% developed HELLP syndrome and 0.9% experienced placental abruption, both of which were higher than the rates reported in the study at Bach Mai Hospital (5.3% and 0%, respectively) [4].

### 4.4. Pregnancy outcomes

Cesarean delivery is recommended as a safe approach for both mother and fetus, as it shortens the duration of monitoring and treatment, reduces the risk of progression to eclampsia, and is considered a mandatory intervention in cases of severe preeclampsia [7]. In this study, 99.1% of

pregnant women underwent elective cesarean delivery, which is notably higher than the rate reported in a 2021 study at a specialized hospital in northern Ethiopia (>50%) [8].

A total of 99.1% of participants received treatment for severe preeclampsia or eclampsia. The mean duration of treatment was  $6.37 \pm 3.6$  days, which is lower than that reported in the 2016–2017 study at Can Tho Central General Hospital ( $6.91 \pm 1.68$  days) [6]. Antihypertensive therapy with  $\geq 2$  drugs was required in 90.4% of cases—higher than the rates reported at Hanoi Obstetrics and Gynecology Hospital in 2022 (76.2%) [3] and Bach Mai Hospital (37%) [4]. Magnesium sulfate 15% was used for seizure prophylaxis in 63.2% of patients. This is lower than the rate observed in the 2011–2012 study at Ndala Hospital, Tanzania (100%) [9], but higher than that reported at Bach Mai Hospital in 2023 (40%) [4].

The proportion of women discharged in stable condition was 95.7%, slightly lower than the 100% reported by Can Tho Central General Hospital in 2016–2017 [6]. The fetal survival rate was 97.5%. The mean gestational age at the time of cesarean section was  $33.1 \pm 2.9$  weeks, which was slightly higher than the mean reported at Hanoi Obstetrics and Gynecology Hospital in 2022 ( $33.0 \pm 3.9$  weeks) [3]. Compared to the gestational age at admission ( $32.7 \pm 3.3$  weeks), the gestational age at delivery was higher, suggesting that medical treatment may have contributed to improved obstetric outcomes. However, the mean neonatal birth weight remained relatively low at  $1,680 \pm 680.4$  grams, indicating intrauterine growth restriction. This can be attributed to inadequate remodeling of the placental vasculature in preeclampsia, leading to reduced blood flow and oxygen supply to the fetus.

## 5. CONCLUSION

The findings highlight that edema, headache, and blurred vision were the most common presenting symptoms among women with severe preeclampsia and eclampsia, with grade 2 hypertension being the most prevalent. The vast majority of cases were diagnosed as severe preeclampsia, and elective cesarean section was the predominant mode of delivery. Maternal outcomes were generally favorable, with most patients discharged in stable condition and a high fetal survival rate observed. These results underscore the importance of early recognition and timely management of preeclampsia and eclampsia to improve maternal and perinatal outcomes.

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