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Maternal and Fetal Outcome Differences in Pregnant Women with Preeclampsia and Severe Preeclampsia at Dr. Saiful Anwar General Hospital

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ABSTRACT

Introduction: Preeclampsia is a major factor leading to complications for both mothers and infants, significantly raising maternal mortality rates in Indonesia, where severe instances result in approximately 1.5% of maternal deaths. It also heightens the chance of perinatal loss, with severe preeclampsia having a rate of around 4.6%. Frequent complications related to this condition are low birth weight, intrauterine growth restriction, asphyxia, and preterm delivery. The objective of this research was to evaluate the differences in outcomes for mothers and infants between those experiencing preeclampsia and those suffering from severe preeclampsia at Dr. Saiful Anwar General Hospital.

Material and Methods: A retrospective analytical observational design was used, analyzing data from pregnant women treated at Education Center and Dr. Saiful Anwar General Hospital between January 2022 and December 2023. Statistical analysis involved the t-test or the Mann-Whitney test.

Results: Findings revealed considerable variations in maternal results, such as eclampsia, elevated hypertension, and alterations in systolic blood pressure the day after delivery, among women diagnosed with preeclampsia versus those with severe preeclampsia. Distinct variations were observed in maternal well-being throughout pregnancy, during delivery, and in postpartum care. Nevertheless, fetal outcomes showed no significant disparities between the two categories, implying that the conditions for the infants during gestation and post-delivery were comparable.

Conclusion: Women suffering from intense preeclampsia encountered various maternal outcomes in contrast to those without the condition, although fetal results were similar in both categories at the hospital that was examined.

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INTRODUCTION

Preeclampsia is a condition related to high blood pressure during pregnancy that is marked by the onset of elevated blood pressure and protein in the urine, often alongside indications of damage to other organs. Typically, preeclampsia arises after the 20-week mark in individuals who had normal blood pressure before pregnancy and may manifest as late as 4 to 6 weeks after giving birth [1]. Globally, the occurrence of preeclampsia accounts for 12% of maternal fatalities annually and is a factor in 25% of deaths among fetuses and newborns.

The prevalence of preeclampsia ranges from 2% to 10% with incidence rates varying from one country to another [2]. In Indonesia, based on 2018 data, the death rate due to hypertension in pregnancy was 33% [3]. Cited from an inquiry by Anindya et al, based on information from the East Java Common Wellbeing Office in 2018, the rate of maternal deaths with preeclampsia comes to 31.23%. The causes of preeclampsia are multifactorial and involve the interaction of various factors, including feto-maternal HLA genotype and HCMV infection, maternal infections such as urinary tract infections, uteroplacental ischemia, genetic predisposition, family history, and

environmental factors such as maternal age, body mass index, and autoimmune disorders.

Preeclampsia involves a significant risk for both mothers and babies and leads to serious health issues. Regarding maternal outcomes, preeclampsia ranks among the leading contributors to maternal deaths in Indonesia, with a mortality rate of approximately 1.5% in severe cases of preeclampsia. Maternal death can be caused by HELLP disorder, eclampsia, sepsis, and serious care within the ICU. In fet al neonatal results, preeclampsia can increase the hazard of perinatal mortality with a predominance of around 4.6% in cases of serious preeclampsia. Common perinatal complications in preeclampsia include Low Birth Weight (LBW), Intrauterine Growth Restriction (IUGR), asphyxia, and premature birth [4].

Various ponders have examined the impacts on mothers and babies in hopeful women who endure from preeclampsia. Inquire about by Anindya and colleagues illustrated a striking association between preeclampsia, whether it presents with serious side effects or not, and different maternal outcomes, especially during labor, as well as fetal outcomes such as intrauterine growth restriction (IUGR), low birth weight (LBW), and early conveyance. In any case, no vital relationship was found with regard to maternal outcomes like antepartum hemorrhage, postpartum hemorrhage, eclampsia, HELLP clutter, maternal fatalities, or perinatal outcomes, such as perinatal injury and neonatal asphyxia [5]. Investigations carried out by Kalam and colleagues revealed that mothers with severe preeclampsia faced various outcomes, including death, HELLP syndrome, eyesight issues, eclampsia, the need for ICU treatment, and sepsis. Simultaneously, the results for the fetus included perinatal death, intrauterine growth restriction (IUGR), low birth weight (LBW), asphyxia, fetal distress, and premature birth [6].

Despite numerous studies focusing on the outcomes for mothers and babies affected by preeclampsia, there has yet to be a study that examines the differences in outcomes by classifying maternal health conditions into preeclampsia and severe preeclampsia within a single research framework. Moreover, the prevalence of preeclampsia remains notably high in East Java, and there are currently no comparable studies conducted in Malang City that explore the detrimental effects of preeclampsia, which lead to increased illness and deaths. Thus, it is essential to carry out a study that investigates the variations in outcomes for mothers and babies by distinguishing between those with preeclampsia and severe preeclampsia at Dr. Saiful Anwar General Hospital. This research aims to enhance the management of pregnancy complications related to preeclampsia, ultimately helping to reduce health risks for both mothers and infants.

MATERIAL AND METHODS

The study design is a retrospective, analytical observational study aimed at examining the relationship between maternal and fetal outcomes in pregnant women with preeclampsia and severe preeclampsia using qualitative data. This multicenter study was conducted at the Obstetrics and Gynecology Department of Dr. Saiful Anwar General Hospital. The research was approved by the Ethical Clearance from the Unair Hospital Research Ethics Commission, and research permission was obtained from the Education, Training, and Research Dr. Saiful Anwar General Hospital.

The study population consisted of all pregnant women treated at the tertiary and secondary hospitals within the HKFM Education Centers of Dr. Saiful Anwar General Hospital from January 2022 to December 2023. A total of 77 pregnant women were selected through a sequential non-random sampling technique. The inclusion criteria included pregnant women diagnosed with preeclampsia or severe preeclampsia, while the exclusion criteria involved women with incomplete medical records or other contraindications.

Data were collected using medical records of pregnant patients with preeclampsia and severe preeclampsia from January 2022 to December 2023. The dependent variables were maternal and fetal outcomes, while the independent variables included the severity of preeclampsia. The research instrument was based on qualitative data extracted from medical records.

Descriptive statistics were employed to present the initial data, with categorical information shown as figures (percentages). Chi-square tests were utilized for the categorical information, while numerical data were shown as mean±SD (when normally distributed) or median (range) if they did not follow a normal distribution. The significance level was set at $p < 0.05$, with a confidence level of 95%. The Independent t-test or Mann-Whitney test was used for numerical data analysis.

RESULTS

Based on the Kolmogorov-Smirnov test, maternal and fetal outcomes were found to be abnormal with a p value of less than 0.05 ($p < 0.05$). Based on the results of the normality test analysis, the data were declared not normally distributed, so the analysis was conducted using the Mann-Whitney test (Table 1). The results of the measurable test of contrasts in maternal results with preeclampsia and severe preeclampsia obtained a p-

value = 0.000 ($p < 0.05$), which implies that there's a critical contrast in maternal results in pregnant ladies with preeclampsia and severe preeclampsia at Dr. Saiful Anwar General Hospital (Table 2).

Table 1. Normality Test of the Data

Research Variables	p-value	Information
Mother's Results	0.005	Abnormal
Fetal Exodus	0.002	Abnormal

The results of the factual test of the distinction between eclampsia and preeclampsia and extreme preeclampsia obtained a p-value = 0.000 and 0.015 ($p < 0.05$), which suggests that there's a critical distinction in eclampsia in pregnant ladies with preeclampsia and extreme preeclampsia. Serious hypertension and preeclampsia and extreme preeclampsia obtained a p-value = 0.010 and 0.000 ($p < 0.05$), which suggests that there's a noteworthy distinction in serious hypertension in pregnant women with preeclampsia and severe preeclampsia. The difference in systolic blood pressure on D+1 of delivery with severe preeclampsia obtained a value of $p=0.018$ ($p<0.05$), which means there is a significant difference in systolic blood pressure on D+1 of delivery in pregnant women with severe preeclampsia (Table 3).

The results of the factual test of contrasts in fetal results with preeclampsia and severe preeclampsia obtained p-values = 0.653 and 0.756 ($p>0.05$), which implies there's no critical contrast in fetal results in pregnant ladies with preeclampsia and severe preeclampsia (Table 4).

DISCUSSION

The findings of the research indicated that there were notable differences in the outcomes for mothers among pregnant individuals experiencing preeclampsia and those with severe preeclampsia at Dr. Saiful Anwar General Hospital. A ponder by Anindya and colleagues found a noteworthy association between preeclampsia, in any case of side effect seriousness, and maternal outcomes, particularly the labor process, as well as fetal outcomes such as intrauterine growth restriction, low birth weight, and early delivery. In any case, no critical interface was distinguished with respect to maternal results, including antepartum and postpartum hemorrhage, eclampsia, HELLP disorder, maternal mortality, and perinatal results like perinatal mortality and neonatal asphyxia. In addition, a consider by Kalam and group moreover illustrated the maternal repercussions of serious preeclampsia, which included passing, HELLP disorder, vision issues, eclampsia, requiring serious care, and sepsis. The fetal repercussions were famous to incorporate perinatal mortality, IUGR, LBW, asphyxia, fetal distress, and preterm delivery. Extra chance components include having numerous pregnancies, being either exceptionally youthful or more seasoned as a mother, in conjunction with a family history showing preeclampsia or HELLP disorder [7].

Preeclampsia is complex and occurs because of the relationship between the mother and the fetus, and its effects involve many organs. The initial clinical presentation of preeclampsia usually does not appear until the weeks leading up to the birth of the fetus. In preeclampsia, pregnancy can cause hypertension, which will then progress to organ damage. If damage has occurred, laboratory test results show signs such as proteinuria and liver dysfunction [1,5].

The findings of the study showed that there was a noteworthy distinction in the rate of eclampsia in pregnant women with preeclampsia and severe preeclampsia at Dr. Saiful Anwar General Hospital. Ndwiga et al.'s consider appeared to indicate that moms with EO-PE were more likely to encounter preeclampsia with serious complications compared to moms with LO-PE [8]. The incidence of eclampsia was not significantly associated with the onset of eclampsia. Compared with the non-PE group, the PE group had the higher frequency of hypoproteinemia ($p = 0.006$), organ damage ($p = 0.041$). Other unfavorable maternal results, such as pleural and peritoneal emission, eclampsia, DIC, postpartum hemorrhage, placental abruption, and maternal death, did not show noteworthy contrasts between the two groups ($p > 0.05$) [9].

Eclampsia is frequently (in 78-83% of instances) indicated by symptoms such as ongoing headaches at the back or front of the head, vision disturbances, sensitivity to light, and changes in mental state. Nevertheless, eclampsia can manifest without prior indications or signs. It may arise before, during, or after childbirth. It is important to mention that a sizable

Table 2. Differences in Maternal Outcome in Pregnant Women with Preeclampsia and Severe Preeclampsia at Dr. Saiful Anwar General Hospital

Variables	Group	English: Z	p-value
Mother's Results	Preeclampsia	-3,718 years	0.000
	Severe Preeclampsia	-3.533	0.000

Table 3. Differences in Maternal Outcome Factors in Pregnant Women with Preeclampsia and Severe Preeclampsia at Dr. Saiful Anwar General Hospital

Factor	Group	English: Z	p-value
Eclampsia	Preeclampsia	-2,503 years	0.012
Pulmonary edema		0.000	1,000
HELLP Syndrome		-1,799 years	0.072
Acute Kidney Failure		0.000	1,000
Severe hypertension		-2,564 years	0.010
CVA		0.000	1,000
Death of Mother		0.000	1,000
Premature labor < 37 weeks		-1,265 years	0.206
Premature birth < 34 weeks		-1,535 years	0.125
IUGR disease		-0.316	0.752
Systolic blood pressure H+1 after delivery		-1,511 years	0.131
Diastolic blood pressure H+1 after delivery		-1,786 years	0.074
Enter ICU		-1,332 years	0.183
Eclampsia	Severe Preeclampsia	-2,438 years	0.015
Pulmonary edema		0.000	1,000
HELLP Syndrome		-1,108 years	0.268
Acute Kidney Failure		0.000	1,000
Severe hypertension		-5,055 years	0.000
CVA		0.000	1,000
Death of Mother		0.000	1,000
Premature labor < 37 weeks		-0.085	0.932
Premature birth < 34 weeks		-0.084 years	0.933
IUGR disease		-0.776	0.438
Systolic blood pressure H+1 after delivery		-2,369 years	0.018
Diastolic blood pressure H+1 after delivery		-1,872 years	0.061
Enter ICU		-1,573 years	0.116

portion of women (20-38%) do not exhibit the typical symptoms of preeclampsia, like high blood pressure or protein in the urine, prior to having a seizure. The headache is thought to indicate a rise in cerebral perfusion pressure, swelling in the brain, and hypertensive encephalopathy. It is crucial to acknowledge that many patients experience sudden eclampsia without any prior warning signs or symptoms [8].

Earlypreeclampsia raises the likelihood of issues in premature babies. Elevated rates of cesarean sections do not safeguard infants from intraventricular bleeding. Respiratory distress syndrome was encountered more often and with greater severity in the preeclamptic group, even though we might anticipate better lung development because of significant intrauterine stress factors that hasten lung maturation [10]. RDS was the predominant anomaly seen in both sets. Preterm delivery due to preeclampsia frequently led to a more serious type of RDS, necessitating surfactant treatment and extended durations of respiratory assistance. Worldwide, preeclampsia impacts 2% to 8% of pregnancies; however, its occurrence differs among racial groups and also among segments within various nations [11].

Riva's study indicated that up to 92 mothers qualified for this research, including 46 mothers with severe preeclampsia without complications and 46 mothers suffering from severe preeclampsia accompanied by HELLP syndrome. The findings regarding maternal outcomes in cases of eclampsia, both with and without HELLP syndrome complications, revealed significant results. According to the statistical analysis, mothers with severe preeclampsia and HELLP syndrome have a fivefold increased risk of developing eclampsia compared to those with uncomplicated preeclampsia. HELLP syndrome results from the progression of severe preeclampsia, increasing the likelihood of obstetric issues like eclampsia. Therefore, providing patients diagnosed with HELLP syndrome with prophylactic treatment using magnesium sulfate is essential to prevent seizures.

There is a significant difference in systolic blood pressure H+1 postpartum in pregnant women with preeclampsia and severe preeclampsia. At Dr. Saiful Anwar General Hospital, Aulya's research showed that medical history has a significant relationship in pregnant women with preeclampsia. Chronic hypertensive preeclampsia is preeclampsia that occurs in pregnant

Table 4. Differences in Fetal Outcomes in Pregnant Women with Preeclampsia and Severe Preeclampsia at Dr. Saiful Anwar Malang Regional Hospital

Variables	Group	English: Z	p value
Fetal Exodus	Preeclampsia	-0.653	0.653
	Severe Preeclampsia	-0.311	0.756

women who have suffered from hypertension before pregnancy [12]. A mother who has a history of genuine sickness will imperil her possess condition during pregnancy. Hence, pregnant ladies who have a history of genuine sickness during pregnancy have a higher risk of encountering preeclampsia compared to moms who don't have a history of genuine illness. The well-being status of the mother, some time recently and during pregnancy, is an imperative figure that impacts the rise and progression of complications. A history of diabetes and hypertension is one of the components related to the event of preeclampsia.

The findings of the ponder showed that there was a critical distinction in extreme hypertension in pregnant ladies with extreme preeclampsia. At Dr. Saiful Anwar General Hospital, extreme preeclampsia is one of the complications that can occur during pregnancy. Serious PE is characterized by hypertension where systolic blood pressure is > 160 mmHg and or diastolic blood pressure is 110 mmHg, accompanied by proteinuria > 200 mg/day. Serious PE can moreover be accompanied by other complications such as renal failure, liver issues, neurological complications, or hematological complications [13]. Xiao thinks about appeared that a history of preeclampsia, long-term hypertension, and need for orderly antihypertensive treatment are chance components for inveterate hypertension complicated by preeclampsia amid pregnancy. The event of preeclampsia in pregnant ladies with constant hypertension increases the frequency of HELLP disorder in the mother and fetal trouble [14].

History of preeclampsia, persistent high blood pressure, and absence of consistent antihypertensive care are factors that contribute to chronic hypertension associated with preeclampsia during pregnancy. The development of preeclampsia in expectant mothers who already have chronic hypertension raises the likelihood of enduring hypertension post-pregnancy, because of the existence of HELLP syndrome in the mother and stress on the fetus [15]. The findings of the research indicated that there were variations in maternal results among expectant mothers concerning their health throughout pregnancy, labor, and after delivery in cases of preeclampsia and severe preeclampsia at Dr. Saiful Anwar Malang Regional Hospital.

The results of the study showed no significant difference in fetal outcomes in pregnant women with preeclampsia and severe preeclampsia at Dr. Saiful Anwar General Hospital. Musa's study showed no significant relationship between preeclampsia and neonates [16]. Another study was conducted by Sirenden et al. on birth weight, Apgar scores, and fetal complications in mothers with severe preeclampsia [16].

The condition of preeclampsia is recognized when hoisted blood pressure (160/110 mmHg or higher) is recorded on two isolated events after 20 weeks of pregnancy, or when blood pressure of 140/90 mmHg or more is famous on two or more events separated by at least four hours. Additional indicators for diagnosis include the presence of protein in the urine or any of the following conditions: low platelet count, kidney dysfunction, liver problems, fluid in the lungs, or ongoing neurological issues. Recent research suggests that proteinuria is no longer considered a critical factor in the diagnosis of preeclampsia. The identification of preeclampsia is divided into two types based on related characteristics, which are preeclampsia without severe symptoms and preeclampsia with severe symptoms.

Preeclampsia alludes to the unused onset of hypertension and proteinuria after 20 weeks of development in a already normotensive lady. Pregnant ladies with preeclampsia have a higher risk of maternal, fetal, and neonatal complications [17]. Preeclampsia is complex, occurring due to the maternal-fetal relationship, and its effects involve multiple organs. The initial clinical presentation of preeclampsia usually does not appear until the weeks leading up to delivery. In preeclampsia, pregnancy can induce hypertension, which then progresses to organ damage. If damage has occurred, laboratory results show signs such as proteinuria and liver function abnormalities [17].

Preeclampsia has a high risk of maternal and fetal outcomes and contributes to serious complications. In maternal outcomes, preeclampsia is one of the main causes of maternal death in Indonesia, with a maternal mortality rate of around 1.5% in cases of severe preeclampsia. Maternal death can be caused by HELLP syndrome, eclampsia, sepsis, and intensive care in the ICU. In fetal neonatal outcomes, preeclampsia can increase the risk of perinatal death, with a prevalence of around 4.6% in cases of severe preeclampsia. Common perinatal complications in preeclampsia also include low birth weight (LBW), IUGR (Intrauterine Growth Restriction), asphyxia, and premature birth [6].

Severe preeclampsia not only occurs in pregnant women but also affects perinatal outcomes. Common perinatal outcomes are LBW, IUGR, asphyxia, fetal distress, premature birth, and even death [6]. Mothers with preeclampsia have a 2.7 times greater risk of giving birth to a baby with stunted growth compared to mothers with uncomplicated pregnancies. Preeclampsia, as a pregnancy complication characterized by decreased blood flow and uteroplacental ischemia, is the most dominant risk factor for intrauterine growth retardation. Srinivas et al. stated that mothers with preeclampsia have a 2.7 times greater risk of giving birth to a baby with stunted growth compared to mothers with uncomplicated pregnancies. In accordance with the results of the study, it was shown that from mothers with severe preeclampsia, 4 babies (6.2%) experienced IUGR. The results of the study showed no difference in fetal outcomes in the condition of the baby during pregnancy until after birth due to various conditions during pregnancy with Preeclampsia and Severe Preeclampsia because Dr. Saiful Anwar General Hospital is a type A hospital that is a referral for other hospitals in a hierarchical manner where the fetal outcome variable can be handled at the previous hospital [11].

CONCLUSION

There is a significant difference in eclampsia in pregnant women with preeclampsia and severe preeclampsia, severe hypertension, and systolic blood pressure H+1 postpartum in pregnant women with severe preeclampsia. There is a difference in maternal outcome in pregnant women related to maternal health during pregnancy, childbirth, and postpartum, with Preeclampsia and Severe Preeclampsia at Dr. Saiful Anwar General Hospital. There is no difference in fetal outcome on the condition of the baby during pregnancy until after birth as a result of various conditions during pregnancy, with Preeclampsia and Severe Preeclampsia at Dr. Saiful Anwar General Hospital, Malang.

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CONFLICT OF INTEREST

There is no conflict of interest for this research.

REFERENCES

1. Christopher et al, (2020) "Preeclampsia—Pathophysiology and Clinical Presentations: JACC State-of-the-Art Review," *J. Am. Coll. Cardiol.*, vol. 76, no. 14, pp. 1690–1702, doi: 10.1016/j.jacc.2020.08.014.
2. Tesfahun E, Tadesse S, Hailu A, Minda A, Ekubay M, Tariku B, (2023) "Prevalence of Preeclampsia and Associated Factors among Antenatal Care Attending Mothers at Tirunesh Beijing General Hospital, Addis Ababa, cEthiopia.," *Adv. Public Heal.*, vol. 3, no. 7
3. Kemenkes (2021) "Peringatan Hari Preeklamsia Sedunia Tahun 2021.
4. M. Matyas. (2022) "Dampak Preeklamsia Dini terhadap Hasil Bayi Prematur.
5. POGI. (2016) "Pedoman Nasional Pelayanan Kedokteran: Diagnosis dan Tata Laksana Pre-eklamsia.," *Jakarta.*
6. C. Kalam, F. W. Wagey, and S. P. Mongan (2017) "Luaran Ibu dan Perinatal pada Kehamilan dengan Preeklampsia Berat di RSUP Prof. Dr. R. D. Kandou Manado Periode 1 Januari - 31 Desember 2016," *e-CliniC*, vol. 5, no. 2, doi: 10.35790/ecl.5.2.2017.18542.
7. C. Mehedint, A. Petca, B. C. Miron, I. Pacu, and M. C. Dumitras (2022) "HELLP Syndrome — Holistic Insight into Pathophysiology," pp. 1–14
8. N. Bernolian *et al.* (2023) "Update Manajemen Preeklamsia dengan Komplikasi Berat (Eklamsia, Edema Paru, Sindrom HELLP)," *Indones. J. Obstet. Gynecol. Sci.*, vol. 6, no. 1, p. 7, doi: 10.24198/obgynia.v6i1.402.
9. T. Lei *et al.* (2021) "Proteinuria may be an indicator of adverse pregnancy outcomes in patients with preeclampsia: a retrospective study," *Reprod. Biol. Endocrinol.*, vol. 19, no. 1, pp. 1–8, doi: 10.1186/s12958-021-00751-y.
10. M. Matyas *et al.* (2022) "Early Preeclampsia Effect on Preterm Newborns Outcome," *J. Clin. Med.*, vol. 11, no. 2, pp. 1–9, doi: 10.3390/jcm11020452.
11. R. Fox, J. Kitt, P. Leeson, C. Y. L. Aye, and A. J. Lewandowski (2019) "Preeclampsia: Risk factors, diagnosis, management, and the cardiovascular

impact on the offspring," *J. Clin. Med.*, vol. 8, no. 10, pp. 1–22, doi: 10.3390/jcm8101625.

12. Y. Aulya, V. Silawati, and W. Safitri (2021) "Analisis Preeklampsia Ibu Hamil pada Masa Pandemi Covid-19 di Puskesmas Sepatan Kabupaten Tangerang Tahun 2021," *J. Akad. Baiturrahim Jambi*, vol. 10, no. 2, p. 375, doi: 10.36565/jab.v10i2.387.
13. B. L. and J. Kristi L. Stringer, Bulent Turan, Lisa McCormick, Modupeoluwa Durojaiye, Laura Nyblade, Mirjam-Colette Kempf (2017) "The ATP/ADP Translocase Drives Mitophagy Independent of Nucleotide Exchange.," *Physiol. Behav.*, vol. 176, no. 3, pp. 139–48.
14. B. M. C. Kehamilan, X. Rui, N. Zijie, and H. Ren (2024) "Analisis Faktor Risiko Preeklamsia pada Ibu Hamil dengan Hipertensi Kronis dan Dampaknya terhadap Luaran Kehamilan," pp. 1–8, 2024.
15. M. A. Brown *et al.*, "The hypertensive disorders of pregnancy: ISSHP classification, diagnosis & management recommendations for international practice (2018) *Pregnancy Hypertens.*, vol. 13, no. May, pp. 291–310, doi: 10.1016/j.preghy.2018.05.004.
16. L. B. Tolu, E. Yigezu, T. Urgie, and G. T. Feyissa (2020) Maternal and perinatal outcome of preeclampsia without severe feature among pregnant women managed at a tertiary referral hospital in urban Ethiopia," *PLoS One*, vol. 15, no. 4, pp. 1–10, doi: 10.1371/journal.pone.0230638.
17. H. P. Karrar, S. A., Martingano, D. J. (2024) *Preeclampsia.*