

## Neonatal and Fetal Outcomes of Pregnant Mothers with Hypertensive Disorder of Pregnancy at Hospitals in Wolaita Zone, Southern Ethiopia

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### ABSTRACT

**Background & aim:** Hypertensive disorders of pregnancy are among the severe medical disorders peculiar to pregnancy. It is one of the risk factors during pregnancy either for the mother or fetus or both. Therefore, this study aimed to assess fetal and neonatal outcomes of mothers with hypertensive disorders of Pregnancy.

**Methods:** This hospital-based cross-sectional study was conducted on neonates born from June 20 to November 20, 2014 at hospitals in Wolaita zone, Southern Ethiopia. The check lists of the study conducted on Prevalence of Hypertension and Complications of Hypertensive Disorders in Pregnancy in patients visiting in the Delivery Ward of Valiasr Hospital were used as base and then modified before being used in our study. Data were analysed using Epi Info (version 7) and SPSS (version 20). Bivariate and multivariate analyses were used to identify factors associated with perinatal outcomes. Analysis were used to identify factors associated with perinatal outcome.

**Results:** Preeclampsia and eclampsia can adversely affect the wellbeing of the fetuses and neonates. Nulliparous women were about five times more likely to develop unfavorable outcome in comparison with multiparous women (AOR 4.85; 95% CI: 0.064-12.442).

**Conclusion:** Hypertensive disorder of pregnancy is associated with the increased risk of adverse fetal and neonatal outcome. Therefore, it is of utmost importance to have timely diagnosis and appropriate care.

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### Introduction

Hypertensive disorder of pregnancy is a very severe medical disorder associated with high blood pressure (1). Normal blood pressure in pregnant women reduces at the

beginning of pregnancy up to 20 weeks of gestation, and then slowly increases until the time of delivery (2-3).

The study conducted in Geneva, in 2008, on

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high blood pressure in pregnancy showed that 5-8% of all pregnancies are complicated by hypertension. The most common risk of hypertension is preeclampsia. Hypertensive disorder in pregnancy is higher in primigravida mothers. However, hypertension is mostly associated with long standing essential hypertension or chronic renal failure in multipara. If all causes of hypertension are considered in pregnancies, preeclampsia accounts for 80%, essential hypertension 18%, renal disease 1.9%, and eclampsia 0.1% of them (4).

The prevalence of preeclampsia is usually after 20 weeks of gestation with hypertension and proteinuria (5). It is primarily a disorder of primigravida; however, multigravida pregnant women with a new partner have prominent risk of preeclampsia (6-7). Pregnancy-induced hypertension (PIH) is one of the risk factors during pregnancy either for the mother or fetus or both. The risk factors entail intrauterine fetal death, still birth, preterm baby, maternal death, and seizure (8-10). Additionally, the long-term sequel of women with a history of PIH includes greater risks of cerebrovascular disease, ischemic heart disease, and renal disease (11-13).

Therefore, it is very important to assess fetal and neonatal outcome of pregnant mothers in order to devise different strategies to reduce fetal and neonatal morbidity and mortality.

## Materials and Methods

This hospital-based cross-sectional study was conducted on all fetuses and newborns of pregnant mothers with hypertensive disorder of Pregnancy referring to hospitals in Wolaita Zone, Southern Ethiopia, from June 20 to November 20, 2014. The administrative center of Wolaita Zone is Wolaita Soddo situated at 334 Km far from Addis Ababa along the main highway passes through Arbaminch to Hosanna. There are three functional hospital zones, including one governmental hospital and the two private ones.

Wolaita Soddo Hospital (WSTRH) is the governmental hospital located in the eastern part of municipality, approximately 2km from the centre of the town. It was established in

1920 E.C. The hospital serves about three million people with a very wide catchments area of about 250km radius. This hospital has 150 beds and 2 operational theatres. There are four major departments, including obstetrics and gynecology, pediatrics, internal medicine, and surgery, as well as four minor departments, including psychiatry, ophthalmology, dentistry. Moreover, there are follow-up clinics for chronic illness, such as tuberculosis, HIV, diabetes mellitus. The main diagnostic modalities in the hospital are routine laboratory investigation, radiological service, gynecology and obstetrics clinic, where pregnant women are having follow-up.

The study was performed after obtaining research the consent of all mothers. The check lists of the study conducted on Prevalence of Hypertension and Complications of Hypertensive Disorders in Pregnancy in patients visiting in the Delivery Ward of Valiasr Hospital were used as base and then modified before being used in our study. Data collectors and supervisors were seven diploma holder and three bachelor holders in nursing, respectively. The data was analyzed through Epi Info (version 7) and statistical SPSS software (version 20). Binary Logistic regression was used to see the impact of pregnancy induced hypertension on fetal and neonatal outcome.  $P < 0.05$  was considered statistically significant.

The inclusion criteria of study for mother were very critically ill status, refusal to give consents, admission to receive care.

After the approval of proposal, a letter of support and permission was obtained from Research Ethical Review Committee of Wolaita Soddo University. The permission was obtained from the hospitals. The purpose of study was described to the participants. The obtained information was kept confidential.

## Results

### Demographic information of the neonates

Out of 225 fetuses, 62.7% ( $n=141$ ) of the cases were male. The 72% of neonates were born within 37-42 weeks of gestation. There was also no case of post-term neonates. Concerning Apgar score of the newborn babies, the Apgar score of 30.7% and 43.5% of the newborns were lower than 3 and greater than 6,

respectively. Moreover, 25.8% of the neonates had the Apgar score of 3-6 at birth (Table 1).

**Table 1.** Demographic characteristics of pregnant mothers with hypertensive disorder of pregnancy

Personal characteristics	Category	Frequency	Percentage (%)
Sex	Male	141	62.70
	Female	84	37.30
Gestational age	Term	162	72.00
	Preterm	63	28.00
Birth weight	Macrocosmic	4	1.80
	Normal	156	69.3
	Low birth weight	61	27.10
Apgar score	Very low birth weight	4	1.80
	Seven to ten	69	30.70
	Three to six	98	43.55
	Less than three	58	25.75

### Neonatal and fetal outcome

According to Table 2, 42.2% (n=95) of fetuses were without any complication. However, 25.8% (n=58) of them had in

trauterine growth restriction. In addition, intrauterine fetal death occurred in 8.89% (n=20) of the cases.

**Table 2.** Fetal and neonatal outcome of pregnant mothers with hypertensive disorder of pregnancy

Neonatal and fetal outcome		
Category	Frequency	Percentage
Normal	95	42.22
IUFD	20	8.89
IUGR	58	25.78
Still birth	18	8.00
Fetal asphyxia	12	5.33
Meconium aspiration	14	6.22
ENND	8	3.56

IUFD: intrauterine fetal death; IUGR: intrauterine growth restriction; ENND: early neonatal death

**Table 3.** Determinants of fetal outcome of pregnant mothers with hypertensive disorder of pregnancy

Variable	Category		P-value	AOR (95% C.I.)
	Unfavorable	favorable		
Age of mother in year				
20-24	18	10	0.04	3.478 (0.034-18.72)
25-29	34	78	0.86	1.243 (0.026-37.62)
30-34	31	34	0.001	1.142 (0.034-18.72)
35-39	12	8	*	*
Gestational age				
Term	75	87	*	*
Preterm	20	43	0.047	5.126 (0.033-16.94)
Parity				
Nulliparous	67	28	0.02	4.85 (0.064-12.442)
Multiparous	28	102	*	*
Blood pressure				
140/90-159/109 mm Hg	50	82	*	*
>160/110 mm Hg	45	48	0.03	5.266 (0.134-25.45)
Type of HDP				
PIH	4	1	*	*
Preeclampsia	43	121	0.014	3.784 (0.014-12.182)
Eclampsia	48	8	0.06	6.129 (0.024-22.147)
ANC follow Up				
Yes	75	116	*	*
No	20	14	0.679	5.6570 (0.032-11.286)

### Determinants of fetal and neonatal outcome

The obtained data of multivariate analysis revealed that the age range of 20-24 years, parity, type of HDP, and high blood pressure were strongly associated with unfavorable fetal and neonatal outcome ( $P < 0.05$ ). In addition ANC follow up was not associated ( $P > 0.05$ ). As can be seen in Table 3, nulliparous women were about 5 times more likely to develop unfavorable outcome in comparison with multiparous women (AOR 4.85; 95% CI: 0.064-12.442). The odd of having unfavorable outcome in preterm was 5.126 (0.033-16.94), the odd of having unfavorable outcome in eclampsia was 6.129 (0.024-22.147) and the odd of having unfavorable outcome among blood hypertension of greater than was 160/110 mm Hg was 5.266 (0.134-25.45).

### Discussion

The prevalence of PIH can cause multiple complications in the mother and baby. It is associated with increased risks of serious outcomes, such as premature delivery, intrauterine growth restriction, perinatal mortality and morbidity, acute renal failure, acute hepatic failure, bleeding at the time of delivery and postpartum bleeding, maternal mortality, and morbidity (14-17). The hazards of these outcomes depend on the severity of hypertension, gestational age at the onset of hypertension, and gestational age at the time of delivery (18-19).

Likewise other studies, it was found that hypertensive disorder in pregnancy was related to significant perinatal morbidity and mortality (20-21). Moreover, it was revealed in the current study that the most common manifestation of hypertensive disorder in pregnancy was preeclampsia, followed by eclampsia, which was consistent with the findings of other similar studies (18-19, 22).

In this study, it was also found that poor fetal and neonatal outcomes were respectively six and four times higher in severe preeclampsia and eclampsia than in gestational hypertension. Likewise, the findings of another study (22) indicated that pregnant mothers who had preeclampsia and eclampsia were more likely to develop unfavorable outcome, compared to mothers without preeclampsia and eclampsia,

which can be due to very high blood pressure. This means that high blood pressure reduces low normal uteroplacental blood flow, which can affect the well-being of fetuses.

According to the findings of the current study, preterm delivery had unfavorable outcomes, compared to term delivery. Consistently, another study suggested that preterm delivery was the most important determinant of neonatal morbidity and mortality in developed countries (23-24). This might be due to the significant immaturity of fetal system, which causes failure to adaptation of intrauterine or extra uterine life. In addition, this may be a result of pregnancy complications or pre-existing maternal medical conditions that can cause an increased risk of morbidity and mortality in neonates (25-27).

The main limitation of this study was that arterial blood gas analysis was not included in the study to determine fetal acidosis. Therefore, we use Apgar score as a best indicator of fetal asphyxia. Apgar score can indicate the degree of birth asphyxia even in the presence of arterial blood gas analysis.

### Conclusion

Hypertensive disorder of pregnancy is associated with the increased risk of perinatal adverse effects. As a result, early diagnosis and appropriate supervisions are very important.

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### Conflicts of interest

Authors declare no conflicts of interest.

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