OUTCOME OF HYPERTENSIVE DISORDERS OF PREGNANCY AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN ADMITTED TO JIMMA UNIVERSITY MEDICAL CENTER, SOUTHWEST ETHIOPIA

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ABSTRACT

BACKGROUND: Hypertensive Disorder of Pregnancy (HDP) is one of the most common obstetric complications that occur during pregnancy. It occurs in about 5 – 10 % of pregnancy and accounts for 10 – 15 % of maternal death worldwide. The disorder is also associated with perinatal mortality and complications. This study intends to assess maternal and perinatal outcome of hypertensive disorders of pregnancy.

OBJECTIVE: The main objective of this study was to assess outcome of Hypertensive Disorders of Pregnancy and associated factors in Jimma University Medical Center.

METHOD: Hospital based cross sectional study was conducted among 202 mothers. Purposive sampling method with consecutive technique was employed using interviewer administered questionnaires. Bivariate and multivariable binary logistic regression analysis was conducted.

RESULT: From 1980 total admissions to labor and maternity ward, 202(10.2%) mothers were diagnosed with HDP. Preeclampsia with severity feature was the most (60%) common presentation followed by eclampsia (10.4%). About one third (32 %) of the mother developed at least one maternal complication. Hemolysis elevated liver enzyme and low platelet (HELLP) syndrome was the most common complications (38.5%) followed by aspiration pneumonia (20 %). Five (2.4 %) mothers were died during the study period, three of them were due to eclampsia complicated by pulmonary edema and two were due to preeclampsia with severity feature complicated by acute kidney injury (AKI) with encephalopathy. Place of residency (AOR = 0.142, 95 % CI: 0.025, 0.801) and eclampsia (AOR = 9.852, 95% CI: 2.963, 133) were significantly associated with maternal outcome.

CONCLUSION: The presence of preeclampsia with severity features and eclampsia has been associated with poor maternal and perinatal outcomes.

KEYWORDS: Hypertensive disorders of pregnancy, maternal outcome, perinatal outcome, Jimma university medical center

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INTRODUCTION

Hypertensive disorder of pregnancy is an umbrella term that encompasses preexisting and gestational hypertension, usually defined as having a blood pressure higher than 140/90 measured on two separate occasions, more than 6 hours apart without the presence of protein in the urine and diagnosed after 20 weeks of gestation[1]. Hypertensive disorders are the most common medical disorders encountered during pregnancy, occurring in approximately 5 to 10% of all pregnancies[2]. Hypertensive disorders in pregnancy (HDP) remain a major global health issue not only because of the associated high adverse maternal outcomes but there is a close accompaniment of significant perinatal morbidity and mortality as well as it consists of wide spectrum of presentation, ranging from minimal elevation of blood pressure to severe form with multiple organ dysfunctions[3].

Among the hypertensive disorders, the pre-eclampsia syndrome, which is a multisystem disorder of unknown etiology, unique to pregnancy either alone or superimposed on chronic hypertension is the most dangerous. Eclampsia is the convulsive form of preeclampsia and affects 0.1% of all the pregnancies[4].

In low income and middle income countries, preeclampsia and eclampsia are associated with 10-15% of direct maternal deaths. World health organization (WHO) estimates the incidence of preeclampsia to be seven times higher in developing countries (2.8% of live births than in developed countries 0.4%) [4]. Incidence of eclampsia in developing nations varies widely, ranging from1case per100 pregnancies to 1 case per 3448 pregnancies. For patients obtaining prenatal care, the incidence is about 1 in 800 patients[5].

The typical feature of preeclampsia is the HELLP syndrome (hemolysis, elevated liver enzymes and low platelet count) or eclampsia that is occurrence of convulsions that cannot be attributed to other etiologic factors. Eclampsia is reported to be associated with a maternal mortality rate of 0.5 – 10% usually requiring high quality intensive care[6].

Preeclampsia predisposes toward potentially lethal complications involving placental abruption, disseminated intravascular coagulation, intracranial hemorrhage, hepatic failure, acute renal failure and cardiovascular collapse. Intrauterine fetal growth restriction (IUGR), intrauterine fetal demise and prematurity appear to be the other related obstetric problems[7].

Clinical situations noticed in HDP trigger elicit diagnosis and aggressive management in order to reverse the adverse maternal and perinatal outcome. Risk factors associated with preeclampsia include chronic hypertension, multifetal gestation, maternal age greater than 35 years, obesity, and African American ethnicity[8,9]. According to the report of the National Center for Health Statistics hypertension complicates around 3.7% of pregnancies in the USA and 16% of pregnancy related deaths. Black women were 3 times at increased risk to die from preeclampsia as white women[10].

Generally the HDP is more common in the developing countries than it is in the developed countries. Several studies have shown that nulliparity, extreme ages, race (being black) and others as risk factors for this problem. There is a significant risk of both maternal and perinatal morbidity and mortality in pregnancies affected by the disorder, this poor pregnancy outcomes are associated with lack of ANC follow up which is associated with delayed recognition and intervention in the affected mothers[2,10,11].

Findings of the study done in India reported that incidence of women presenting with HDP was 6.92%, from these 50.2% were preeclampsia, 35.7% eclampsia, 12.5% were gestational hypertension [12]. According to a population based study in South Africa the incidence of hypertensive disorders of pregnancy (HDP) was 12.5% [13].

World Health Organization estimates that at least one woman dies every seven minutes from complications of hypertensive disorders of pregnancy[14]. Analysis from the World Health Organization (WHO) from a multi-country survey shows that there were about 3-and 5-fold increased risk of perinatal death in women with preeclampsia and eclampsia, respectively, compared to women with no preeclampsia/eclampsia[15].

In Ethiopia as claimed by study conducted on disease burden and Ethiopian healthy system response given the demanding infrastructure, the case-specific fatality rate accounts for 3.8% which is unacceptable high and impermissible. Preeclampsia/eclampsia complicated to 1.2% of all institutional deliveries[16].

Studies figure outs that pregnancies complicated with hypertensive disorders are associated with increased risk of adverse fetal, neonatal and maternal outcome including preterm birth, Intrauterine Growth Retardation (IUGR) and Perinatal death. High perinatal mortality in women with HDP is mainly due to premature delivery and growth restriction[16].

In Ethiopia hypertensive disorder of pregnancy is among the third common causes of perinatal mortality rate (PNMR) accounting for 19% accordingly hypertension complicating pregnancy is a major cause of preterm births resulting in perinatal deaths of fetuses[5]. Few studies conducted in Ethiopia, yet focus on trends and prevalence of HDP, hence this study check out the outcome of HDP and associated factors in order to give direction for the care providers and administrators of the medical center father the finding of the study will help as the base line data for researcher interested in the area.

METHOD:

Study area and period:

Institution based cross-sectional study was conducted from January 01/2019 to June 30/2019 in (JUMC). Jimma University Medical Center is found in Jimma city, Southwest Ethiopia 369 km from Addis Ababa. Jimma University is one of the higher institutions in Ethiopia and JUMC which is part of Jimma University (JU) is established in 1930. It provides services for approximately 9,000 in patient and 80,000 outpatient attendances a year with a very wide catchment population of about 15 million people in southwest Ethiopia. The hospital provides almost all major types of medical care and it has a total of 659 beds of which 52 are found in the maternity ward. The labor and maternity wards are run by midwives, medical interns, resident physicians of obstetrics and gynecology and obstetrics consultants.

Study design:

Facility based cross sectional study design was employed.

Source population:

All mothers who were admitted to labor and maternity ward with hypertensive disorders of pregnancy in JUMC during the study period .

Study population:

Selected mothers among hypertensive disorders of pregnancy admitted to labor and maternity ward who diagnosed with gestational hypertension, preeclampsia with or without severity feature, eclampsia, and chronic hypertension, preeclampsia superimposed on chronic hypertension and gestational age ≥ 28 weeks were included to the study.

Sample size and Sampling technique:

Facility based consecutive sampling technique was employed among eligible women who were admitted during the study period. Sample size was determined by using single population proportion formula with Z=1.96 for 95% confidence level, d (degree of precision expected) of 0.05, and p of 36% (10). The desired sample size after using correction formula was 202.

Data collection:

Data collection tools were prepared in English and translated to local languages Afaan Oromo and Ahmaric, and translated back to English to check its consistence. Pretest was conducted on 5% (11) mothers among similar populations outside of the study area at Shenen Gibe hospital. After making appropriate modification based on pretest data were collected using structured, interviewer-administered questionnaires. Data were collected by trained medical ten medical interns and the principal investigator was motoring the overall data collection on daily basis.

The data was collected by reviewing records of the pregnant ladies and supplemented by interviewing the subjects on admission to labor ward and until discharged so as to assess presence and development of complications. The neonates admitted to Neonatal Intensive care unit (NICU) were followed for possible complications until discharge. The neonates who were discharged immediately after 24 hours of delivery, the mothers were asked on phone about neonatal status and

for any complications at 7 days of life. During discharge, mothers were communicated to answer a phone call at the 7th day or to send call me back request with any available phone to the data collector.

Data processing and analysis:

After checking its completeness collected data was entered to Epidata version 4.1 and exported to SPSS version 20 for analysis. Bivariate binary and multivariable logistic regressions were fitted to identify factors associated with the dependent variables by controlling confounders. Variables with p-value < 0.25 were candidate for multivariate logistic regression to identify factors that affect maternal and perinatal outcome. Statistical Significance was declared at p-value < 0.05 with 95% CI. Both crude odds ratio (COR) and adjusted odds ratio (AOR) with 95% confidence interval were reported.

Ethical consideration:

Ethical approval for the study was obtained from Jimma University Ethical review board. A research ethical committee was dedicated to approve all ethical issues of the research in Jimma university medical center. A verbal consent was obtained from study participants during data collection and the confidentiality was maintained by avoiding identifiers in the data collection tool.

RESULTS

Sociodemographic characteristics

During the study period, there were a total of 1980 deliveries of which 202 (10.2%) were diagnosed to have HDP making response rate of 100%. Most of the mothers 70(34.7%) were in the age group of 25 -29 years. Majority of study participant were Oromo 157(77.7%) and Muslim by religion 143(70.8%). More than half mothers came from rural areas 123(60.9%). This study revealed that 77(38.1%) of study participants had no formal education (See Table 1).

Table1: Frequency distribution of sociodemographic characteristics of mothers admitted with HDP JUMC, January 01/ 2019 to June 30/2019 G.C

Variables	Frequency(N)	Percent(%)
Age in years		
15-19	33	16.3
20-24	38	18.8
25-29	70	34.7
30-34	37	18.3
35 -39	24	11.9
Ethnicity		
Oromo	157	77.7
Amhara	18	8.9
Tigrie	2	1
Gurage	8	4.0
Silte	4	2.0
Other	13	6.4
Religion		
Muslim	143	70.8
Orthodox	39	19.3
Protestant	16	8
Catholic	4	2
Place of residency		
urban	79	39.1
rural	123	60.9
Occupation		
Employee	22	10.9
Merchant	34	16.8
Daily laborer	2	1.0
House maid	8	4
House wife	116	57.4
Farmer	14	6.9
Student	6	3.0
Educational status		
No formal education	77	38.1
Elementary school	66	32.7
Secondary school	32	15.8
Some University/college	18	8.9
University/ college completed	9	4.5
Income per month		
< 1075	34	16.8
1075 - 1680	97	48
1681- 3360	40	19.8
3361- 10920	26	12.8
>10920	5	2.4
Marital status		
single	5	2.5
married	193	95.5
divorced	3	1.5
separated	1	0.5
History of change in partner		
Yes	2	1.0
No	200	99

Obstetric history and HDP diagnosis related variables

The finding of this study shows that 98(48.5%) of mothers were primi-gravida. With regard to ANC service, 192 (95%) of mothers with HDP had at least one ANC visit. About one third (37.6%) had four or more ANC visits. Majority of mothers (61.9%) had ANC follow up at health center. Severe headache and blurring of vision were the most common presentation accounting for 121(59.9%) and 97 (48%) respectively. Twenty one (10.4%) had history of abnormal body movement, of which 4 (2 %) had more than five episodes of abnormal body movement. Eleven (52.3 %) had abnormal body movement before onset of labor.

Majority of the mothers (76.7%) came with referral from nearby health care facility. Of all cases, 44 (21.8%) had systolic blood pressure in severe range (≥ 160) and 28 (13.9%) had diastolic blood pressure in severe range (≥ 110). For the majority of mothers 161(80%) onset of labor was spontaneous and induced in 32(16%) of cases. Cesarean delivery was the most common mode of delivery in 79(39.1 %) of cases. Non reassuring fetal heart rate pattern (NRFHRP)and failed induction were the most common indication for cesarean delivery accounting for 42 (53.2%) and 22(29.7%) of cases respectively. Preeclampsia with severity features was the most common HDP accounting for 121(60%). HELLP syndrome occurred in 25 (12.4 %) of cases. Majority of mothers with HDP were given magnesium sulphate for seizure prophylaxis in 132(65.3%) and diazepam in one third of cases (34.6 %).(See Table 2 and Table 2.1)

Table 2: Frequency distribution of obstetric history related variables among mothers with HDP admitted to JUMC, January 01/ 2019 to June 30/ 2019 G.C

Obstetric Variables	Frequency(N)	Percent(%)
Gravidity		
1	98	48.5
2-4	69	34.2
5-9	35	17.3
Gestational age		
28 to 33	28	13.8
34 to 36	28	13.8
≥37	146	72.4
ANC follow up		
Yes	192	95.0
No	10	5.0
Number of ANC follow up		
1	10	5.0
2-3	107	54.0
≥4	75	37.6
Place of ANC follow up		
Health Center	125	61.9
Private clinic	10	5
Governmental Hospital	47	23.3
Others	10	5.0
Blurring of vision		
Yes	97	48.0
No	105	52
Epigastric pain		
Yes	80	39.6
No	122	59.4
History of abnormal body movement		
Yes	21	10.4
No	181	89.6
Number of abnormal body movement		
< 5	17	80.9
≥ 5	4	19.1
Time of occurrence of abnormal body movement		
Antepartum	11	52.3
Intrapartum	5	23.4
Postpartum	5	23.4
Time from the first convulsion to delivery		
< 12 hours	2	10
12-24 hours	12	57
>24hours	7	33
Previous history of hypertension during pregnancy		
Yes	20	9.9
No	182	90.1
History of diagnosed hypertension before pregnancy		
Yes	14	6.9
No	188	93.3
History of diagnosed cardiac disease		
Yes	4	2.0
No	198	98
History of diagnosed diabetes mellitus		
Yes	3	1
No	199	99
Patient came referred		
Yes	155	76.7
No	47	23.3
Patient came referred from		
Health center	87	43.1
District hospital	51	24.3
Private clinic	9	5.2
Others	8	4.1

Table 2.1: Frequency distribution of HDP diagnosis and management of labor related variables among mothers with HDP admitted to JUMC, January 01/ 2019 to June 30/ 2019 G.C

Obstetric Variables	Frequency(N)	Percent(%)
Systolic BP		
<140	25	12.4
140 - 159	133	65.8
≥ 160	44	21.8
Diastolic BP		
< 90	17	8.4
90 - 109	157	77.7
≥ 110	28	13.9
Onset of labor		
Spontaneous	161	80
Induced	32	16
Mode of delivery		
Spontaneous vaginal delivery	79	36.6
Forceps assisted	37	18.3
Vacuum assisted	8	4
Cesarean delivery	74	39.1
Destructive delivery	4.0	2.0
Reason for Cesarean delivery		
Non reassuring fetal heart rate pattern	42	53.2
Failed induction	22	29.7
Cephalo pelvic disproportion	4	5
Others	8	10.6
Protein in urine		
Negative	45	32.2
+1 and above	157	67.8
AST ≥ 2 times elevated		
Yes	25	12.9
No	177	87.6
ALT ≥ 2 times elevated		
Yes	20	9.9
No	182	90.1
Platelet count		
< 100,000	31	15.3
≥ 100,000	171	84.7
Serum creatinine ≥ 2 times elevated		
Yes	19	9.4
No	183	90.6
Type of hypertensive disorders of pregnancy		
Preeclampsia with severity feature	121	60
Eclampsia	23	11.3
Preeclampsia without severity feature	21	10.3
Chronic hypertension	14	6.9
Preeclampsia superimposed on chronic hypertension	11	5.4
Gestational hypertension	12	5.9
Onset of HDP		
Antepartum	91	45
Intrapartum	77	38
Postpartum	34	17
HELLP syndrome		
Yes	25	12.4
No	177	87.6
Seizure prophlaxis		
Magnesium sulfate	132	65.3
Diazepam	70	34.6
Magnesium sulphate toxicity		
Yes	5	5
No	127	96.2
Magnesium sulphate toxicity detected		
Depressed DTR	3	60
Depressed RR <12	2	40

Maternal outcome with hypertensive disorders of pregnancy

Of the total mothers with hypertensive disorders of pregnancy admitted to labor ward, 147(68 %) of them had favorable maternal outcome. Sixty five (32 %) of them developed at least one maternal complications (unfavorable maternal outcome). HELLP syndrome was the most common maternal complication 25(38.5%. A total of 14(6.9 %) cases of mothers with HDP were admitted to ICU. Of these 9(64.2%) cases were discharged with improvement. Five (35.3%) cases were complicated by maternal death. Three cases were complicated by pulmonary edema and two cases complicated by AKI with encephalopathy (see Table 3).

Table 3 : Maternal outcome among mothers with hypertensive disorders of pregnancy admitted to labor ward, January 01/2019 to June 30/ 2019 G.C.

Obstetric Variables	Frequency(N)	Percent(%)
Maternal complications		
HELLP syndrome	25	38.5
Abruptio placenta	13	20
AKI	10	15.3
Aspiration pneumonia	11	16.9
Pulmonary edema	4	6.2
DIC	2	3
ICU admission		
Yes	14	6.9
No	188	93.1
Outcome after ICU admission		
Died	5	35.7
Discharged improved	9	64.3
Cause of death		
Pulmonary edema	3	60
AKI with encephalopathy	2	40

Perinatal outcome of neonates

According to this study, 188(91.6%) were singleton and 14(8.4%) were twin. Most of the neonates (60.9%) were in the normal birth weight of 2500- 3999 gm followed by low birth weight (1500 -2499 gm) in 20.3 % and very low birth weight (< 1500 gm) in 11.9 % of cases. A total of 187(85.6%) of neonates were alive and 29(14.4 %) were still birth at delivery. Of the total still births 21(72.4 %) were before admission to labor ward and 3 (10.3 %) were after admission in the maternity ward before onset of labor and 5(17.2 %) were intrapartum. Fifty (23.13 %) of the fetuses had developed at least one complication(unfavourable outcome). A total of 30(16 %) neonates were admitted to NICU. HMD and prematurity was the most common indication for NICU admission in 33.3% and in 26.6 % of cases respectively. Twelve (40 %) of neonate admitted to NICU were complicated by ENND. HMD and PNA was the major cause of neonatal death accounting for 7(58.3 %) and 3(25 %) of cases respectively (see Table 4).

Table 4: Perinatal outcome among neonate born to mothers with hypertensive disorders of pregnancy admitted to labor ward, JUMC from January 01/ 2019 to June 30/ 2019 G.C

Obstetric Variables	Frequency(N)	Percent(%)
Fetal outcome at delivery		
Alive	187	85.6
Dead	29	14.4
Time of death		
Before admission	21	72.4
After admission	3	10.3
Intrapartum	5	17.2
Number of fetus		
Singleton	188	91.6
Twin	14	8.4
Birth weight		
<1500 gm	24	11.9
1500-2499 gm	41	20.3
2500-3999 gm	123	60.9
≥ 4000 gm	1	5
APGAR score at 1st minutes		
< 4	5	2.67
≥ 4	182	97.3
APGAR score at 5th minutes		
< 7	12	5.9
≥ 7	175	93.6
Neonate admitted to NICU		
Yes	30	16
No	157	84
Indication for NICU admission		
Prematurity	8	26.6
PNA	5	16.6
MAS	3	10
HMD	10	33.3
EONS	3	10
Other	1	3.3
Neonatal outcome at NICU		
Discharged improved	18	60
Complicated by ENND	12	40
Cause of neonatal death		
HMD	7	58.3
PNA	3	25
Others	2	16

Factors affecting maternal outcome

Out of the 202 mothers, 65 had developed at least one complication making the prevalence of unfavorable maternal outcome of 32 %. Those mothers who came from rural areas were 86 % less likely to have favorable maternal outcome than those who came from urban areas (AOR = 0.142, 95 % CI:0.025,0.801). Mothers who

had history of abnormal body movement had 9.8 times more likely to have unfavorable maternal outcome (AOR = 9.852, 95 % CI: 2.963, 133) than the counterparts. (See Table 5)

Table 5: Factors affecting maternal outcome using multivariate logistic regression among mothers with HDP admitted to labor ward from January 01/ 2019 to June 30/2019 G.C

Variables	Maternal outcome Favourable	Unfavourable	COR (95% CI)	AOR (95% CI)	P value
Place of residence					
Urban	76	3	1	1	1
Rural	85	38	11.3 (3.359-38.18)	0.142(0.025,0.801)	0.027*
Severe headache					
Yes	89	32	0.348(0.56,0.775)	2.255(0.392,12.966)	0.36 2
No	72	9	1	1	
Blurring of vision					
Yes	67	30	3.66(1.714,7.83)	0.529(0.115,2.44)	0.414
No	90	11	1	1	
Epigastric pain					
Yes	54	26	3.474(1.676,7.200)	2.9(0.902,0.801)	0.074
No	101	14	1	1	
Having eclampsia					
Yes	14	9	0.15 (0.062,0.359)	9.852 (2.963,133)	0.002*
No	146	32	1	1	
Mode of delivery					
SVD	69	10	1	1	
Forceps assisted	28	9	0.048(.005,.511)	0.6 (0.01,35.479)	0.806
Vacuum assisted	6	2	0.111(.007,1.776)	1.803(0.012,262.27)	0.816
Cesarean delivery	1	17	0.099(0.01,1.02)	1.17 (0.021,65.237)	0.939
Destructive delivery	57	3	0.107(0.01,1.163)	0.431(0.007,27.44)	0.691
AST ≥ 2 times elevated					
Yes	12	14	0.341(0.136,0.856)	0.579(0.053,6.366)	0.655
No	149	26	1	1	
ALT ≥ 2 times elevated					
Yes	12	8	0.32(0.122,0.852)	0.062 (0.04, 1.031)	0.053
No	149	32	1	1	
Platelet count					
<100,000	2	23	1	1	
≥ 100,000	159	18	0.01(0.002,0.045)	6.286(0.603,65.542)	0.124

Factors affecting perinatal outcome

Gestational age, having history eclampsia, antepartum onset of HDP of the mother had shown strong association with unfavorable perinatal outcome. Neonate delivered at GA 28 -33 weeks had 10 times more likely to have unfavorable fetal outcome than those who delivered at GA of 34 -36 weeks and ≥ 37 weeks (AOR = 10.117,95% CI: 1.635 , 62.6). Those mothers who had abnormal body movement were 2.7 times more likely to have unfavorable perinatal outcome than those who were not having abnormal body movement (AOR=2.761, 95% CI :1.898,8.487). Antepartum onset of HDP increased the risk of unfavorable perinatal outcome by more than 6-fold compared with intrapartum and postpartum onset of HDP (AOR = 6.6, 95% CI: 3.4,12.75) (See Table 6).

Table 5: Factors affecting maternal outcome using multivariate logistic regression among mothers with HDP admitted to labor ward from January 01/ 2019 to June 30/2019 G.C

Variables	Neonatal outcome Favourable	Unfavourable	COR (95% CI)	AOR (95% CI)	P value
Occupation Employee					
Merchant			0.222(0.03,1.535	0.248(0.0232.623)	0.247
Daily laborer	18	4	0.172(0.027,1.108)	0.156 (0.015,1.583)	0.116
House maid	28	5	0.25(0.027,2.319)	0.207(0.011,4.045)	0.299
House wife	8	2	0.2(0.022,1.816)	0.09(0.05,1.88)	0.121
Farmer	77	28	0.369(0.069,1.908)	0.408(0.056,2.982)	0.377
Student	84	62			
Gestational age					
28 to 33	6	22	7.2(1.284,40.365)	10.117(1.635,62.60)	0.013*
34 to 36	17	17	0.667(0.819,26.604)	4.228(0.642,27.857)	0.134
≥37	13	21	1	1	
ANC					
Yes	147	45	1	1	0.691
No	5	5	3.267(0.905,11.703)	0.678(0.1,4.61)	
Severe headache					
Yes	84	37	2.304(1.135,4.678)	0.661(0.181,2.414)	0.531
No	68	13	1	1	
Blurring of vision					
Yes	64	33	3.2(1.586,6.475)	1.15(0.465,2.848)	0.762
No	87	14	1	1	
Having eclampsia					
Yes	12	11	0.306(0.125,0.747)	2.761(1.898, 8.487)	0.042*
No	140	39	1	1	
Onset of HDP					
Antepartum	57	34	2.6 (1.57-4.38)	6.6(3.4-12.75)	0.003*
Intrapartum	62	12	1.4(0.77-2.55)	0.5(0.99-1.04)	0.41
Postpartu	13	4	1	1	
Systolic BP					
<140	20	5	1	1	
140 - 159	103	30	0.483(0.151,1.544)	0.535(0.136,2.112)	0.372
≥ 160	29	15	0.563(0.268,1.185)	0.531(0.2,1.408)	0.203
ALT ≥ 2 times elevated					
Yes	12	8	0.453(0.174,1.182)	1.852(0.612,5.608)	0.276
No	139	42	1	1	
HELLP syndrome					
Yes	16	9	0.536(0.22,1.303)	1.029(0.296,3.581)	0.961
No	136	41	1	1	
AKI					
Yes	10	9	0.321(0.122,0.842)	3.478(1.038,11.651)	0.43
No	142	41	1	1	

DISCUSSION

The magnitude of HDP among 1980 mothers who gave birth at JUMC during the study period was 10.2%. Preeclampsia with severity feature was the commonest HDP followed by eclampsia. Among mothers with hypertensive disorders of pregnancy admitted to labor ward, 68% of them had favorable maternal outcome without complication and 32% had unfavorable maternal outcome with at least one maternal complication. Among mothers with HDP, 23.13% of the fetuses had developed unfavorable perinatal outcome with at least one complication and 76.87% had favorable perinatal outcome with no complication.The most common neonatal complications were prematurity, still birth, early neonatal death (ENND) and hyaline membrane disease (HMD).

In this study, the prevalence of HDP was 10.2% which is higher than the study done in the same area eight years back and it is also higher than the global prevalence of HDP which is 5- 10%[2]. Majority (48.5%) of the mothers with HDP were primigravida. Similar study conducted in India showed that primigravida accounted for majority of HDP compared to multigravida[17]. Ninety five percent of mothers with HDP had ANC follow up of whom 37.6% had four and above visits. Similar studies conducted in Addis Ababa Gandhi Memorial Hospital showed 96.5% had ANC follow up. Another study In Nigeria showed 76.6 % of pregnant mothers with HDP received ANC18. But, a study in India showed 82% of them had no ANC follow up [17]. The higher rate of ANC follow up in the current study could be because of the awareness created by government intervention and improvement in ANC coverage. According to this study, HDP was found to be more common in mothers who had ANC visit during current pregnancy.

In this study, preeclampsia with severity feature was the commonest presentation (60%) which is similar with reported from many other studies. A study in Tikur Anbessa Hospital of Addis Ababa and Gandhi Memorial Hospital showed that 78 % and 82.5 % of HDP respectively were due to preeclampsia with severity feature[9]. while study done at Jimma University Specialized hospital showed preeclampsia with severity feature occurred in 51.9 % of cases[3].The large number of preeclampsia with severity feature cases in this study could be due to the fact that the study was undertaken in referral hospital which serves more advanced cases which were difficult to be managed at lower level.

Regarding maternal outcome, 32% of mothers had unfavorable outcome with at least one complication. HELLP syndrome was the most common complication accounting for 38.5 % followed by abruptio placenta in 20% aspiration pneumonia in 16.9% AKI in 15.3% and pulmonary edema in 6.2%.

Similar study done in Addis Ababa governmental hospital showed 36% experienced at least one complication, like HELLP syndrome in 39.5% aspiration pneumonia in 17.5%, pulmonary edema in 17% and abruption placenta in 15.3% of cases(19). Hence, our findings are seems like consistent. Almost 70% of mothers were from rural areas and there was statistically significant association between place of residency being rural area and unfavorable maternal outcome. This may be due to the fact that mothers who live in rural areas have lower access to health facility which is an important contributing factor for the development of maternal complications. About 50% of mothers with eclamptic mothers had antepartum onset. But there was no statistically significant association between time of first episode of convulsion to delivery and unfavorable maternal outcome. Liver function tests were elevated ≥ 2 times (AST in 12.9% and ALT in 9.9%) of cases. Similar study done in India showed that liver function tests both AST and ALT elevated ≥ 2 times in 17.3% and 18.67% of cases respectively (20). Renal function tests were elevated with serum creatinine level of ≥ 1.2 mg/dl. Similar study done in India showed elevated serum creatinine ≥ 1.2 mg/dl in 59% of cases[20].

HELLP syndrome developed in 12.4% of cases which is higher than the previous study accounting for 8.9%5. While the study conducted in Addis Ababa reported HELLP syndrome developed in around 39.5% of the women10. A relatively higher HELLP syndrome cases in this study may be due to delays in early detection and timely management of preeclamptic women.

Five mothers (2.4 %)with hypertensive disorders of pregnancy died during the study period, of this three

were due to eclampsia complicated by pulmonary edema and two of them were complicated by AKI with encephalopathy.More over eclampsia contributed for 10 cases out of 14 ICU admissions while the remaining 4 cases were due to preeclampsia with severity feature. The Case fatality rate for eclampsia was 13%. There was statistically significant association with mother having eclampsia and unfavorable maternal outcome with P -value of 0.02.

In this study, 23% of the neonates had developed unfavorable perinatal outcome with at least one complication and 76.87% had favorable perinatal outcome with no complication. The most common perinatal complications were still birth in 58 % very low birth weight 48% ENND in 24% and HMD in 20 %.

Similar study done at Addis Ababa governmental hospital showed that the most common neonatal complications were prematurity with 32.8% respiratory distress syndrome with 37.9% very low birth weight with 30.2 %[10]. Furthermore, other studies focusing only on eclamptic women reported that perinatal deaths were caused by prematurity in 68%[20,21], on the other hand, significantly increased odds of perinatal mortality were observed among women with eclampsia, which was consistent with other studies[22], this is probably because of the severe nature of the eclampsia disease, which usually complicates by severe intrauterine asphyxia and severe placental abruption16. The perinatal mortality rate of HDP in this study was 189 per 1000 total birth. The proportion of still birth was more than 2.5 times higher than early neonatal death 14.4%. In this study HMD was the most common cause of neonatal death accounting for 58.3 % of cases. The presence of HDP has been linked with poor maternal and perinatal outcomes which were manifested by increased maternal ICU admissions, preterm delivery rate, LBW and PNMR. Moreover, there was a 13 % case fatality rate in those mothers affected by eclampsia. This study also revealed the presence of high intervention rates by induction of labor, cesarean section and instrumental delivery than what expected. The fact that the study was undertaken in a tertiary teaching hospital may partly explain the high rate of interventions observed.

CONCLUSION

The magnitude of HDP was 10.2%. Preeclampsia with severity feature was the commonest HDP followed by eclampsia. Among mothers with hypertensive disorders of pregnancy, majority of them assessed with favorable maternal outcome without complication. The most common maternal complications were HELLP syndrome and abruptio placenta. Place of residence and eclampsia were significant predictors of maternal outcome. Near to one fourth of the fetuses born to mother with HDP had developed unfavorable perinatal outcome. The most common neonatal complications were prematurity and still birth.

RECOMMENDATION

Due emphasis should be given to strategies that reduce HDP related unfavorable maternal and neonatal outcomes. Place of residence and having eclampsia should be taken into account in planning to reduce unfavorable maternal outcome. Antepartum and intrapartum close monitoring of high risk mothers in the maternity ward should be improved to prevent IUFD and other. Further study with gold standard design with large sample size is recommended.

DECLARATIONS:

Competing/ Conflict of Interest

All authors declare that they have no any financial and non-financial competing interests.

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