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Prevalence and Maternal Outcomes of Hypertensive Disorders of Pregnancy: A Retrospective Study

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ABSTRACT

Introduction: Hypertensive disorders of Pregnancy are the major complications that cause about 60%–80% of all maternal deaths. Among the hypertensive disorders, the pre-eclampsia syndrome, either alone or superimposed on chronic hypertension, is the most dangerous.
Objectives: To assess the prevalence and the maternal outcomes of hypertensive disorders of pregnancy at Georgetown Public Hospital Corporation Obstetrics and Gynecology Department.
Design: A retrospective descriptive study.
Materials and Method: We looked at 324 women diagnosed with preeclampsia, gestational hypertension, chronic hypertension, and eclampsia that were hospitalized at GPHC between January 2017 and December 2018.
Statistical analysis: Data were analyzed using SPSS version 23. Data were expressed in percentages
Results: The minimum age was 14 years while the maximum age was 43years, the mean age of the patients was 26.35±6.7 years. (51.7%) were primigravid, and One hundred and fifty-seven (48.3%) were multigravida. The overall prevalence was 2.6 per 1000 deliveries. Gestational hypertension accounted for 70.3%. %. HDU admission n=16(4.9%), n=15(4.6) postpartum hemorrhage, HELLP syndrome n=7(2.2%), eclampsia n=7 (2.1%). DIC with maternal death n=1(0.3%), n=3 (0.9%) placenta abruption, n=1(0.3%) renal failure. There was a statistically significant relationship between hypertensive disorders and maternal outcome p= 0.001. Of the perinatal complications; prematurity accounted for 14.2%, NICU admissions n=20 (6.2%) fetal growth restriction=8(2.4%), and Stillbirth n=4(1.2%). Apgar score < 5 in the first minute of life accounted for 4.3%. This Apgar score was statistically significant for perinatal outcome p=0.005.
Conclusion: The prevalence of hypertensive disorder of pregnancy was low in our study. The most prevalent form of hypertensive disorder of pregnancy at Georgetown Public Hospital Corporation was Gestational hypertension. Hypertensive disorders were statistically significant for maternal outcomes.
Recommendations: Routine anthropometric measures and blood pressure checks should be part of every appointment. Promoting early hospital referrals is crucial.

Keywords: Hypertensive disorders of Pregnancy, Gestational hypertension

INTRODUCTION

Over half a million women die each year from pregnancy related causes, 99% in low- and middle-income countries. [1]In many low income countries, complications of pregnancy and childbirth are the leading cause of death amongst women of reproductive years.[1] (Of these deaths, 50% occur in Africa, about 42% in Asia, about 4% in Latin America and Caribbean and less than 1% in the developed countries [2].
Hypertension in pregnancy constitutes the most common medical complication occurring in 12-22% of all pregnancies of which pre-eclampsia remains the leading cause that complicates 10% of all pregnancies.[1,2]. WHO estimated that approximately 60,000 women die each year from pre-eclampsia world-wide.

Hypertensive disorder of pregnancy includes chronic hypertension, gestational hypertension, preeclampsia (PE)- Eclampsia, and chronic hypertension with superimposed preeclampsia.

Hypertensive disorders of pregnancy constitute a perplexing and clinically challenging group of pregnancy complications that are responsible for a substantial burden of illness in developed as well as underdeveloped countries world wide. 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 [1–3.] Although maternal mortality is much lower in high-income countries than in developing countries, 16% of maternal deaths can be attributed to hypertensive disorders [4,5].

Pre-eclampsia and eclampsia account for 24% of all maternal deaths in India, mainly attributed to complications like accidental haemorrhage, disseminated intravascular coagulation, pulmonary edema, cardiac failure, HELLP syndrome, renal failure, adult respiratory distress syndrome and cerebral hemorrhage.[6]

Preeclampsia is defined as new onset of elevated blood pressure and proteinuria (BP>/=140/90 and >/= 0.3gm protein in 24 hours urine specimen) after 20 weeks of gestation in a previously normotensive woman.[3,4]. It is considered severe if blood pressure and proteinuria are increased substantially (BP>/=160/110 and >5 gm protein in 24 hours urine specimen) or symptoms of end organ damage like thrombocytopenia, altered liver function, oliguria, cerebral or visual disturbances, pulmonary edema and fetal growth restriction are present.[3,4]

According to a study carried out by Savita Rani Singhal et al in India renal and liver functions were deranged in 27% and 20% respectively. Among the hypertensive disorders, the pre-eclampsia syndrome, either alone or superimposed on chronic hypertension, is the most dangerous.

Eclampsia is the convulsive form of pre-eclampsia and affects 0.1% of all the pregnancies [6]

In low income and middle income countries, pre-eclampsia and eclampsia are associated with 10-15% of direct maternal deaths. 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%) [7]. Incidence of eclampsia in developing nations varies widely, ranging from 1 case per 100 pregnancies to 1 case per 3448 pregnancies.

The prevalence of preeclampsia in developing countries ranges from 1.8% to 16.7% [10]. According to a retrospective study carried out by Ahmed Hussein Subki and et al in Western Saudi Arabia, the overall prevalence of maternal complications was 9.4%. Cesarean deliveries were more frequent in patients with hypertensive disorder and maternal complications. Additionally, in this study, cesarean deliveries were more prevalent in cases of Preeclampsia or gestational hypertension, but that was not seen with the other hypertensive disorder of pregnancy subtypes. These findings are consistent with a study conducted in Ethiopia between 2010 and 2013 which enrolled 130 women with hypertensive disorder of pregnancy [8].

Eclamptic seizures and ICU admissions were significantly more frequent in women with preeclampsia and eclampsia than in those with other hypertension disorders. Investigations revealed that preeclampsia is a predisposing factor for several potentially lethal complications. Placental abruption, disseminated intravascular coagulation, intracranial hemorrhage, hepatic failure, acute renal failure and cardiovascular collapse, intra uterine fetal growth restriction, intrauterine fetal demise and prematurity appear to be the major lethal obstetric problems that result from preeclampsia

Maternal complications were more frequent in multigravid than primigravid women, which was also reported in a comparative study conducted in Turkey.[9] A hospital-

based study conducted in South Africa showed that HDP contributed for 20.7% of maternal deaths in the country.[10]

Perinatal mortality from eclampsia is reported to be 5% - 11.8% in developed countries as compared to a developing nation such as Tanzania where eclampsia-related perinatal mortality can be as high as 40%. The causes of perinatal death are chronic placental insufficiency, preterm delivery, and placental abruption [8,9.]

Fetal morbidities include preterm delivery, small for gestation, fetal growth restriction (FGR), still births, low birth weight babies.[6,11]

Maternal and perinatal mortality and morbidity due to preeclampsia can only be prevented by accessing the quality of antenatal care, early diagnosis and recognition of risk factors, careful monitoring and timely interventions.

MATERIALS & METHODS

Design: This study was a retrospective descriptive study in the Department of Obstetrics and Gynecology. This research was performed over a 2 year period from January 2017 to December 2018. All medical records of patients admitted to the ObGyn department with hypertension in pregnancy were reviewed. Data collected from the medical records included demographic, clinical and laboratory findings, maternal and fetal outcomes. This information was logged in an Excel document then analyzed using SPSS version 23.

Statistical Analysis

Analysis of variance (ANOVA) was employed for the statistical analysis of parametric data with a normal distribution to determine whether there were any differences between groups. All statistical calculations were carried out using SPSS statistical software version 23.

RESULTS

During the 2-year period, a total of 12,353 deliveries were performed,324 women had HDP representing a prevalence of 2.6 per 1000 deliveries.

A diagnosis of gestational hypertension was made in 227 women (70.3 percent), followed by preeclampsia with severe features (17.6 percent), and six pregnancies were exacerbated by eclampsia (1.6 percent). (table 1)

The main cause of maternal mortality was disseminated intravascular coagulation. maternal death occurred in women diagnosed with eclampsia. The maternal mortality rate was 3.1%.

***Social and Demographic Characteristics of Cases*:**

***Age*:** The minimum age was 14 years while the maximum age was 43years, the mean age of the patients was 26.35±6.7 years. Among the cases 17% (n=55) were teenage women of the age group 14-19 years. The majority of the cases were in the age range of 22-34 years; 54.3% (n=189) while advanced maternal age accounted for 14.2% (n=46) .

***Gravidity*:** Gravidity ranged from 1 to 12. HDP cases comprised of 167 women (51.7%) were primigravid, and 157 (48.3%) were multigravida.

Marital Status: Sixty-two women were married women (19.1%) and 257 were single mothers (79.3%). 4 (1.2%) were in a common law relationship .1 (0.3%) unknown. Five single mothers were eclamptic and 1(0.3%) of married women was eclamptic.

Administrative Regions: Region four accounted for n=208 (64.2%). A total of n=180 cases were referred,79 (30%) referrals from region four followed by region three n=44(13.6%). Hinterland referrals accounted for n=36(11.2%) (table 2)

***Past Medical History*:** There were 46 cases with a previous pregnancy with hypertension 18 had diabetes.

Maternal complications: Maternal complications includes maternal death complicated with DIC n=1(0.3%), HDU admission n=16(4.9%) HELLP syndrome n=7(2.2%) n=15(4.6) postpartum hemorrhage , n=3 (0.9%) placenta abruption, n=1(0.3%) renal failure, eclampsia n=7 (2.1%) (table 3). There was a statistically significant relationship between

hypertensive disorders and maternal outcome *p*= 0.001.

Clinical Presentations: Patients with pre-eclampsia with severe features were reported to have the highest percentages of central nervous system symptoms accounting for 47.6% followed by eclampsia (6.25%). Headache not relieved with analgesics accounted for 40.6%. Similarly, blurred Vision was presented as part of the chief complaints in 9.3% of mothers with severe pre-eclampsia and eclampsia.

Generalized tonic-clonic seizures with loss of consciousness were the main complaint of all eclamptic moms at presentation, and all had a history of headache and blurred vision beforehand. Epigastric discomfort was reported in 2.5% of women. (table 5)

One preeclamptic woman (0.3%) experienced acute renal failure (AKF), which was identified by a creatinine level of at least 1.4 mg/dl. whereas the incidence of acute renal failure has ranged from 4% to 23% in other studies.

***Mode of Delivery*:** A total of 81 (25%) patients received cesarean section. N=21(26%) of these cases were performed due to Non Reassuring fetal heart tracing, and N=10(12.4%) due to worsening features. 76 (23.5%) had a spontaneous vaginal delivery, and 167(51.7%) had induced vaginal delivery. (table 4,4a)

Perinatal outcome

Of the perinatal complications; prematurity accounted for 14.2%, NICU admissions n=20 (6.2%) fetal growth restriction=8 (2.4%), and Stillbirth n=4(1.2%). Apgar score < 5 in the first minute of life accounted for 4.3%. This Apgar score was statistically significant for perinatal outcome *p*=0.005. (table 4)

Table 1 Different types of hypertension disorder in pregnancy (n=324).

Types Of Hypertensive Disorder In pregnancy		
Type of Hypertensive Disorders	**Number Of Cases**	**Percent %**
Gestational Hypertension	179	55.2
Gestational Hypertension With Severe Ranges	48	14.8
Chronic Hypertension	19	5.9
Chronic Hypertension With Superimposed Preeclampsia	9	2.8
Preeclampsia Without Severe Features	2	0.6
Preeclampsia With Severe Features	57	17.6
Eclampsia	7	2.2
Uncontrolled Chronic Hypertension	3	0.9
Total	324	100.0

Table 2: Administrative Regions

Administrative Region	Frequency	Percentage
1	21	6.5
2	10	3.1
3	44	13.5
4	208	64.0
5	12	3.7
6	11	3.4
7	11	3.4
8	3	0.9
9	1	0.3
10	3	0.9

Table 3: Maternal complications

Maternal **Complications**	**Number of cases**	**Percentage**
Eclampsia without ICU admission	2	0.6
Placenta Abruption	3	0.9
HELLP Syndrome	7	2.2
ARF	1	0.3
DIC/maternal death	1	0.3
No Complications	274	84.6
Eclampsia With ICU Admission	5	1.5
PPH	15	4.6
HDU Admission	16	4.9
Total	324	100.0
HELLP: hemolysis, elevated liver enzymes, and low platelet count; ARF: acute renal failure; PPH: postpartum hemorrhage; ICU: intensive care unit, HDU: High dependency unit ,DIC: disseminate intravascular coagulation		

Table 3a: Maternal Complications by Hypertensive Disorder

Type of Hypertensive disorder	Number of Cases N(%)	Maternal death N(%)	HELLP N(%)	DIC	Renal Failure N(%)	PPH N (%)	Placenta Abruption N (%)	ICU Admission N(%)
Preeclampsia with severe features	57(17.6)		2(3.5)		1(1.7)		1(1.7)	
Preeclampsia without SF	2(0.6)							
Eclampsia	8(2.4)	1(0.3)		1(0.3)				6(1.8)
Chronic with Superimposed Preeclampsia	9(2.7)		1(0.3)					1(0.3)
Uncontrolled Chronic	3(0.9)							
Gestational Hypertension	179(55.2)		2(0.6)			8(2.6)	1(0.3)	
Gestational Hypertension with severe range Blood Pressure	48(14.8)		2(0.6)			5(1.5)	1((0.3)	

Table 4a: Onset of labor

Reason for C Section	Frequency	Percentage
Previous Cesarean Section	18	22.2
Non Reassuring Fetal Heart	21	26
Malpresentation	4	5
Failed IOL	8	9.8
Worsening Features	10	12.4
Others	20	24.6

Table 4: Reason for C Section

Onset of labour	Frequency	Percentage
Cesarean Section	81	25
SVD	76	23.5
Induced Vaginal Delivery	176	51.7
SVD: Spontaneous vaginal delivery		

Table 5: Perinatal outcomes

Perinatal Outcomes	No. Of Cases	Percentage
Live Birth	291	90.1
Fresh Stillbirth	2	.6
Macerated Stillbirth	2	.6
NICU Admission	20	6.2
Fetal Growth Restriction	8	2.5
Prematurity	46	14.2

Table 5a. Clinical manifestations of Patients with Severe Preeclampsia and Eclampsia

Clinical manifestations	Number of patients(%)
Headache	26(40.6%)
Blurred Vision	6(9.3%)
Epigastric pain	8(12.5%)
Seizure and Loss of consciousness	4(6.25%)

DISCUSSION

Hypertensive disorders of Pregnancy are the significant complications that are responsible for about 60%–80% of all maternal deaths [1]. HDP accounts for 10-14% of maternal mortality globally.

The age range of 22 to 34 years, which made up 54.3 percent of the cases in our study population (n=189), was represented by the majority of cases. The association of maternal age to the severity of hypertension was not statistically significant (p = 0.0435). This finding is comparable to a study conducted in Ethiopia by Eshetu et al.

In accordance with their obstetric history, 51.7% of them were primigravida, and 48.3% were multigravida. This finding is coherent with a study conducted by Subrat et al in Northeast India in 2019. However, Ahmed et al in a similar study conducted on Western Saudi Arabia of patients found 43.3% primigravida while 56.7% multiparous.

Referred cases contributed to 55.4%, 35.8% with gestational hypertension,11.7%

preeclampsia, and 11% with chronic hypertension. The overall prevalence of HDP was 2.6% which is similar to a study carried out by Ahmed et al in 2017 in Western Saudi Arabia with a prevalence of 2.4%.

The most prevalent hypertension disorder diagnosed in this study was Gestational hypertension (70.3%), followed by preeclampsia with severe features (17.6%), and chronic hypertension with 9.6%. Seven pregnancies were complicated with eclampsia accounting for 2.1%.

Generalized tonic-clonic seizures with loss of consciousness were the main complaint of all eclamptic moms at presentation, and all had a history of headache and blurred vision beforehand.

One preeclamptic woman experienced acute renal failure (AKF), which was identified by a creatinine level of at least 1.4 mg/dl.

The main cause of maternal mortality was disseminated intravascular coagulation. This case had a combination of the following complications disseminated intravascular coagulation, eclampsia, hemoperitoneum leading to maternal death. The maternal mortality rate was 3.1%.

There was, no significant association between age and diagnosis, parity and diagnosis with maternal mortality (p-value > 0.08).

Obesity increases the risk of gestational hypertension (P= 0.002). This is similar findings to a study carried out by Al-Hakmani et al 2016 in Muscat.

Maternal complications include maternal death with DIC 0.3%, HDU admission 4.9%, HELLP syndrome 2.2%, 4.6% postpartum hemorrhage, 0.9% placenta abruption, 0.3% renal failure and eclampsia 2.1%. There was a statistically significant relationship between hypertensive disorders and maternal outcome p= 0.001.

Prematurity accounted for 14.2% of perinatal complications of HDP. NICU admissions accounted for 6.2%, fetal growth restriction 2.4%, and Stillbirth 1.2%. Apgar score was significantly associated with perinatal outcome p=0.005.

17 percent of babies with birth weights considered had low birth weights. This could have been a result of iatrogenic preterm delivery by the obstetrician.

81 patients had cesarean sections in total , 26% of the cases had cesarean section due to Non Reassuring fetal heart tracing followed by 22.2% of patients had cesarean section because of previous Cesarean section, and 12.4% had cesarean section because of worsening features accounting for 3.1%. 76 (23.5%) had a spontaneous vaginal delivery, and 167(51.7%) had induced vaginal delivery. There was a statistically significant relationship between hypertensive disorders of pregnancy and mode of delivery p-value of 0.001.

Limitations

A significant disadvantage of the study was the inability to speak with patients or family members about specific cases in more detail. This was due to the fact that the data was dependent on the level of documentation, the effectiveness of record keeping, and the intended use for information documentation.

CONCLUSION

The most prevalent hypertensive disorder of pregnancy at Georgetown Public Hospital Corporation was Gestational hypertension, followed by preeclampsia. Hypertensive disorders were statistically significantly and positively correlated with maternal outcomes.

This study affirms the value of expanded antenatal surveillance for pregnant hypertensive women in order to identify developing issues early and refer patients to hospitals with the necessary resources for future therapy.

Recommendations

1. Routine anthropometric measures and blood pressure checks should be part of every appointment. Protein dipstick testing is required for those who have symptoms. Promoting early hospital referrals is crucial.

2. In order to improve early detection of issues including fetal growth restriction and infants who may be at risk of intrauterine mortality, all practitioners should have training in basic obstetric ultrasonography.
3. Quality recordings: Record keeping is a huge concern. To make it easier to find and return files, a standardized, distinctive, and user-friendly filing system should be created. Alternatively, a computerized system for research should be in place.
4. Regular maternal and fetal monitoring, easy access to antihypertensive and anticonvulsant medications, and increased availability of these medications in other regional hospitals, health centers, and health posts are also advised.

Declaration by Authors

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REFERENCES

1. Duley, L. (2009). The Global Impact of Pre-eclampsia and Eclampsia. *Seminars In Perinatology*, *33*(3), 130-137. https://doi.org/10.1053/j.semperi.2009.02.010
2. Gestational Hypertension and Preeclampsia. (2020), *135*(6), e237-e260. https://doi.org/10.1097/aog.0000000000003891
3. Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. (2000), *183*(1), s1-s22. https://doi.org/10.1067/mob.2000.107928
4. Steegers, E., von Dadelszen, P., Duvekot, J., & Pijnenborg, R. (2010). Pre-eclampsia. *The Lancet*, *376*(9741), 631-644. https://doi.org/10.1016/s0140-6736(10)60279-6
5. Khan, K., Wojdyla, D., Say, L., Gülmezoglu, A., & Van Look, P. (2006). WHO analysis of causes of maternal death: a systematic review. *The Lancet*, *367*(9516), 1066-1074. https://doi.org/10.1016/s0140-6736(06)68397-9
6. Berzan, E., Doyle, R., & Brown, C. (2014). Treatment of Preeclampsia: Current Approach and Future Perspectives. *Current Hypertension Reports*, *16*(9). https://doi.org/10.1007/s11906-014-0473-5
7. Högberg, U. (2005). The World Health Report 2005: ``Make every mother and child count" — including Africans. *Scandinavian Journal Of Public Health*, *33*(6), 409-411. https://doi.org/10.1080/14034940500217037
8. Seyom, E., Abera, M., Tesfaye, M., & Fentahun, N. (2015). Maternal and fetal outcome of pregnancy related hypertension in Mettu Karl Referral Hospital, Ethiopia. *Journal Of Ovarian Research*, *8*(1). https://doi.org/10.1186/s13048-015-0135-5
9. Ates, S., Batmaz, G., Sevket, O., Molla, T., Dane, C., & Dane, B. (2013). Pregnancy Outcome of Multiparous Women Aged over 40 Years. International Journal Of Reproductive Medicine, 2013, 1-4. https://doi.org/10.1155/2013/287519
10. Moodley, J. (2004). Maternal Deaths Associated with Hypertensive Disorders of Pregnancy: a opulation-Based Study. *Hypertension In Pregnancy*, *23*(3),

247-256. https://doi.org/10.1081/prg-200030301

11. Lakew, Y., Reda, A., Tamene, H., Benedict, S., & Deribe, K. (2013). Geographical variation and factors influencing modern contraceptive use among married women in Ethiopia: evidence from a national population based survey. *Reproductive Health*, *10*(1). https://doi.org/10.1186/1742-4755-10-52

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