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Pregnancy Outcome In Hypertensive Disorder Of Pregnancy With Low Platelet count

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Abstracts

Aims: To study pregnancy outcome in HDP with low platelet count.

Objectives: This study aimed to assess the frequency of occurrence, identify diverse delivery methods, and investigate the maternal and fetal outcomes associated with Hypertensive Disorders of Pregnancy (HDP) in the presence of low platelet count.

Methodology: This cross-sectional descriptive study took place at Paropakar Maternity and Women's Hospital (PMWH) in Kathmandu, focusing on hospital-based data.The sample size was 35. Total duration of data collection was 6 months from shrawan 2078 to poush 2078.

Results: A total of 35 cases fulfilling the inclusion criteria were enrolled. Incidence of HDP with low platelet count was 100/810 (12.3%). Majority of cases were primigravida 19/35(54.3%), of age group 20-24 10/35(28.6%). Mostly, pre-eclampsia cases had thrombocytopenia 17/35(48.5%). Majority of cases 21/35 (60%) had LSCS and 14/35 (40 %) had vaginal delivery. Maternal complication included MICU admission, HELLP syndrome, PPH and abruptio placenta and fetal complication were LBW, NICU admission, Perinatal asphyxia, IUFD, IUGR and early NND were noted.

Conclusions: This study reveals a significant association between HDP accompanied by thrombocytopenia and heightened maternal and fetal morbidity. The primary maternal complications observed included admission to the Maternal Intensive Care Unit (MICU) for monitoring post the administration of a loading dose of MgSo4, followed by occurrences of HELLP syndrome and PPH. Fetal complications encompassed admissions to the NICU, instances of LBW, perinatal asphyxia, IUGR, and IUFD.

Introduction

Hypertensive Disorders of Pregnancy (HDP) stand out as a significant maternal pathology, exerting profound and adverse effects on both the mother and the fetus.[1] HDP, hemorrhage and infection forms a deadly triad contributing to maternal morbidity and mortality.[2]

Preeclampsia affects 5 to 7% of pregnancies, while eclampsia occurs in 0.5 to 2% of all pregnancies. The incidence of HDP is reported to be between 6 to 15% in primigravida, contrasting with a lower range of 2 to 4% in multigravida.[3]cerebral imaging is not necessary for the diagnosis or management of most women with eclampsia. The onset of eclamptic convulsions can be antepartum (38-53%

The main function of platelets is to contribute to hemostasis. In a healthy individual, the normal platelet count typically falls between 150 to 450 × 10^9/L, with 95% of healthy people having platelet counts within this range. During pregnancy, thrombocytopenia is defined as a platelet count less than 150 × 10^9/L. Counts ranging from 100 to 150 × 10^9/L are categorized as mild thrombocytopenia, while counts from 50 to 100 × 10^9/L are considered moderate thrombocytopenia. Severe thrombocytopenia is defined as counts less than 50 × 10^9/L .[4] Thrombocytopenia during pregnancy can be

attributed to factors such as hemodilution in late pregnancy, a reduction in platelet survival time typical of normal pregnancies, and an elevation in platelet activation .[5]the most common of hypertensive disorders of pregnancy is an idiopathic multisystem disorder affecting 2 – 10% of all pregnancies and together they form one member of the deadly triad, along with hemorrhage and infection that contribute greatly to the maternal morbidity and mortality rates. The identification of this clinical entity and effective management play a significant role in the outcome of pregnancy. Platelet count is emphasized to play a significant role in hemostasis mechanism of preeclampsia and the degree of thrombocytopenia increases with severity of preeclampsia. This study was conducted to find correlation of platelet count in severe preeclampsia, mild preeclampsia and normal subjects.

A reduction in platelet count correlates with an escalation in both maternal and fetal morbidity and mortality.[6] Overt thrombocytopenia, defined by a platelet count below 100×10^9/L, signifies the severity of the disease process. In most cases, when platelet numbers continue to decrease beyond this level, delivery is recommended as a proactive measure .[1] HELLP syndrome, with platelet count below 100×10^9/L, is associated with adverse fetal outcomes and manifests in 2–12% of women with severe pre-eclampsia or eclampsia.[7]

Methods

This cross-sectional descriptive study was conducted at Paropakar Maternity and Women's Hospital in Thapathali, Kathmandu. Data collection spanned a 6-month period from Shrawan 2078 to Poush 2078.Pregnant women admitted for delivery in the third trimester, with HDP and low platelet count, who met the defined inclusion criteria were included.

Inclusion criteria

All pregnant women in third trimester with hypertensive disorder of pregnancy admitted for delivery.

Exclusion criteria

The study excluded patients with known cases of the following conditions: chronic hypertension, diabetes mellitus, renal disease, thyroid disorder, established bleeding disorders and platelet dysfunction, preexisting diseases such as leukemia, lymphoma, and connective tissue disorders. Additionally, individuals taking medications known to affect platelet count (such as heparin, cinchona alkaloids derivatives like quinine and quinidine, vancomycin, linezolid, sulfonamides) or causing bone marrow depression (like carbamazepine, methimazole, chloramphenicol, propylthiouracil) were also excluded.

A written informed consents were obtained from the women meeting the inclusion criteria prior to enrollment. All details of the patient, relevant history and examination findings was obtained using a structured questionnaire. Routine antenatal investigations like Hb%, blood grouping and Rh typing, RBS, HBsAg, HIV, VDRL, routine urine, urine albumin, PT, RFT, LFT, and platelet count by automated hematology analyzer were conducted. In cases of low platelet count, a platelet count was verified through peripheral blood smear analysis.Obstetric ultrasound scans were performed for fetal assessment, along with abdominopelvic scans to rule out other causes of hypertension. A detailed study on the onset of labor (spontaneous or induced) and the mode of delivery (vaginal, assisted vaginal delivery, or cesarean section) was documented. Fetal outcomes, such as birth weight, Apgar scores at 1 minute and 5 minutes, gestational age, the need for resuscitation, instances of stillbirth, and the requirement for NICU admission, were assessed. Cases were followed up in the postnatal ward, and the health condition of their neonates was also recorded. Data collected were tabulated, and interim analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 20. Results were presented in tables for comprehensive presentation and interpretation

Results

Throughout the six-month study period, a total of 11,500 obstetric cases were admitted. Among these, 810 cases were of HDP. Incidence of hypertensive disorder of pregnancy was 810/11500 (7%) and that of hypertensive disorder of pregnancy with low platelet count was 100/810 (12.3%), incidence of GHTN was 600/810 (5.2%), Preeclampsia was 180/810 (1.5%) and eclampsia was 30/810(0.26%). Hundred cases were found to have thrombocytopenia. After excluding the exclusion criteria, 35 cases with low platelet count were enrolled in the study.

Table 1: Maternal age, gravida and gestational age and HDP with low platelet count

GHTN n (%)		HDP			PLATELET COUNT			
		PRE-ECLAMPSIA n (%)	ECLAMPSIA n (%)	100-150×109/L n (%)	50-<100×109/L n (%)	<50×109/L n (%)	Total	
Age	15-19	1 (33.3)	0	2 (66.7)	2 (66.7)	1 (33.3)	0	3
	20-24	1 (10)	6 (60)	3 (30)	4 (40)	4 (40)	2 (20)	10
	25-29	1 (12.5)	4 (50)	3 (37.5)	6 (75)	2 (25)	0	8
	30-34	2 (28.6)	3 (42.8)	2 (28.6)	5 (71.4)	1 (14.3)	1 (14.3)	7
	35-39	1 (16.7)	4 (66.6)	1 (16.7)	2(33.3)	2(33.3)	2 (33.3)	6
	≤40	0	0	1(100)	0	1 (100)	0	1
Gravida	G1	3 (15.8)	9 (47.4)	7 (36.8)	9 (47.4)	7 (36.8)	3 (15.8)	19
	G2	1 (10)	5 (50)	4 (40)	6 (60)	2 (20)	2 (20)	10
	G3	2(40)	2 (40)	1 (20)	3 (60)	2 (40)	0	5
	G4	0	1 (100)	0	1 (100)	0	0	1
Gestational Age	≤36	2 (9.5)	12 (57.1)	7 (33.3)	10 (47.6)	6(28.5)	5(23.8)	21
	37-42	4 (28.6)	5 (35.7)	5(35.7)	9(0.64)	5(35.7)	0	14

HDP with low platelet count was most commonly seen in 20-24 years age group 10/35 (28.6%), in primigravida 19/35 (54.3%) cases and most of them were admitted at ≤ 36 weeks of gestation 21/35 (60%).

Table 2: Association of HDP with low platelet count

100-<150×109/L n (%)		PLATELET COUNT			
		50-<100×109/L n (%)	<50×109/L n (%)	Total n (%)	
HDP	GHTN	6 (100)	0	0	6(17.14)
	PRE-ECLAMPSIA	10 (58.8)	3 (17.6)	4 (23.6)	17(48.57)
	ECLAMPSIA	3 (25)	8(66.7)	1 (8.3)	12(34.3)
	Total n (%)	19 (54.3)	11 (31.4)	5 (14.3)	35

Majority of cases 19/35 (54.3%) of HDP with low platelet count had platelet count in range of 100-<150×10^9/L followed by 11/35(31.4) in range of 50-<100×10^9/L and 5/35 (14.3%) in range of <50×10^9/L.

Table 3: Maternal complications and HDP with low platelet count

NORMAL		Maternal Outcome						Total
		Abruptio placenta	PPH	HELLP SYNDROME	NEED OF MICU ADMISSION	OTHERS		
HDP	GHTN	5 (83.3)	0	1 (16.7)	0	1 (16.7)	0	6
	PRE-ECLAMP-SIA	4 (23.6)	1 (5.9)	3 (17.6)	4 (23.6)	11 (64.7)	0	17
	ECLAMPSIA	0	0	3 (25)	5 (41.7)	11(91.7)	1 (8.3)	12
PLATELET COUNT	100-150×10^9/L	9(47.4)	1 (5.3)	4 (21.1)	0	8 (42.1)	1 (5.3)	19
	50-<100×10^9/L	0	0	3 (27.3)	4(36.4)	10 (90.9)	0	11
	<50×10^9/L	0	0	0	5 (100)	5 (100)	0	5
Total		9(25.7)	1 (2.9)	7 (20)	9(25.7)	23(65.7)	1 (2.9)	35

Out of 35 cases of HDP with low platelet count, 9/35 (25.7%) cases had no complication, 23/35 (65.7%) required MICU admission, HELLP syndrome was seen in 9/35 (25.7%), PPH in 7/35 (20%), abruptio placentae in 1/35 (2.9%) and one (2.9%) case of PPH required blood transfusion. Most of cases were admitted in MICU after receiving loading dose of MgSO4 for close monitoring. Majority had undergone LSCS 21 (60%) and 14 (40) had vaginal delivery. The leading indication for caesarean section was unfavorable cervix 13 (61.9%).

Table 4: Fetal outcome and HDP with low platelet count

	Fetal Outcome						
	Normal	IUGR	IUFD	Perinatal Asphyxia	NICU Admission	LBW	Early Neonatal Death
GHTN	5(83.3)	1(16.7)	0	0	0	0	0
Pre-eclampsia	6(35.3)	0	4(23.5)	4(23.5)	4(23.5)	6(35.3)	0
Eclampsia	2(16.7)	2(16.7)	4(33.3)	4(33.3)	4(33.3)	5(41.7)	1(8.3)

Out of 35 newborns of HDP with low platelet count mothers, normal fetal outcome was seen in 13/35 (37.1%), perinatal asphyxia was seen in 8/35 (22.9%), 8/35 (22.9%) newborns required NICU admission, 8/35 (22.9%) were IUFD,11/35 (31.4%) had LBW, IUGR was present in 3/35 (8.6%) and early neonatal death occurred in 1/35 (2.9%) due to perinatal asphyxia. The most common indication for NICU admission was perinatal asphyxia 4/35 (11.4%) followed by LBW 4/35 (11.4%).

Discussion

The incidence of HDP in this study was 810/11,500 cases, representing 7%. Among these, the occurrence of HDP with low platelet count was 100/810 cases, indicating a prevalence of 12.3%. This finding aligns with studies conducted by Burrows et al. and E. Habas, but contrasts with the results reported by Tejeswini K.K., who observed a higher incidence. It's worth noting that this variation could be attributed to the smaller sample size in the present study.[4,8,9]

In this study, HDP were predominantly observed in the 20-24 age group, accounting for 28.6% (10/35 cases).Similar observations were reported by Gupta A et al., Tejeswini KK, and Deshmukh V in their respective studies.[5,9,10]

This study revealed that Hypertensive Disorders of Pregnancy (HDP) were predominantly observed in primigravida, constituting 19/35(54.3%). This aligns with analogous findings reported by Gupta A et al. (58.6%), Tejeswini KK (53%), and Singh et al. (58.9%) in their respective studies.[5,9,11]

In this study, platelet counts in the range of 100-150 × 10^9/L were observed in all cases of GHTN, 10/17(58.8%) cases of pre-eclampsia, and 3/12(25%) cases of eclampsia. Platelet counts in the range of 50-<100 × 10^9/L were found in 3/17(17.6%) cases of pre-eclampsia and 8/12(66.7%) cases of eclampsia. Platelet counts below 50,000 were noted in 4/17(23.6%) cases of pre-eclampsia and 1/12(8.3%) cases of eclampsia. This is in line with the findings of Vinodhini R, who reported thrombocytopenia in 22% of cases.[12] Likewise, a study conducted by Sultana et al. demonstrated that among 100 cases of HDP, 24 cases exhibited a normal platelet count, while 76 cases showed a deranged platelet count. The distribution of thrombocytopenia severity in these cases was as follows: mild thrombocytopenia in 41%, moderate thrombocytopenia in 29%, and severe thrombocytopenia in 6% .[13]

In this study, 14/35(40%) cases of deliveries were conducted vaginally, while 21/35(60%) cases underwent cesarean section. This distribution is in line with a study conducted by Chaudhary P, where approximately 55.3% of cases primarily underwent cesarean section as the mode of delivery.[14] The case control study done by Farah S et al demonstrated increased caesarean rate 93.3% compared to 20% in pre-eclampsia and normotensive group.[15] Our study revealed that unfavourable cervix is the most common indication of caesarean section as most of cases were terminated in <36 weeks of gestation and accounted for 13/21 (37.1%) cases followed by fetal distress 1/21(4.8). In study done by Singhal et al, they reported 32% of caesarean section of their total 100 cases of pre-eclampsia where fetal distress was most common indication of caesarean section 59.28% followed by NPOL 12.5%.[16]

In the present study, the most common maternal complication was the need for MICU admission, with 23/35(65.7%) cases of patients who had received MgSo4 being admitted to MICU. This was followed by HELLP syndrome at 25.7%, Postpartum Hemorrhage (PPH) at 7%, and abruptio placenta at 2.9%. These findings are comparable to a study conducted by Meshram et al., which reported HELLP syndrome in 10.6% of cases and PPH in 8.5%[17] This study presents contrasting findings to those reported by Sultana et al., where the incidence of HELLP syndrome was 6%, and by Riaz et al., who noted an incidence of HELLP syndrome at 5%, Postpartum Hemorrhage (PPH) at 4%, and Disseminated Intravascular Coagulation (DIC) in 1% of cases .[13,18] Similarly, in contrast to this study, Deshmukh V revealed PPH as most common complication affecting 22% cases, DIC in 11% followed by abruptio placenta in 8% cases, 7.6% cases with moderate and severe thrombocytopenia had pulmonary edema and ARF was seen in 2% cases.[10]

Fortunately no maternal mortality occurred in this study though 2% maternal mortality was observed by Deshmukh V, 1 % by Sultana et al, Meshram et al. 2.12% and Riaz et al.1.3%.[10,13,17,18]

In this study LBW was seen in 11/35 (31.4%) cases due to iatrogenic prematurity and placental insufficiency while higher rates were seen in study conducted by Rahim R, among patients with low platelet counts, 74.28% of babies were born with low birth weight.[19]

In this study incidence of IUGR was 3/35 (8.6%) which is comparable to study done by Shahla K and noted 9.8% cases of IUGR and contrast findings were noted by Sultana 19.14% and Meshram et al 19.14%. [13,17,20]

In this study incidence of IUFD was 8/35(22.9%) which is comparable to study done by Deshmukh V, where out of 100 newborns, there were 16 IUFD. In the severe thrombocytopenia group, 5/13(38.4%) of patients presented with IUFD, whereas in the mild thrombocytopenia group,3/25 (12%)of patients presented with IUFD .[10]

In this study perinatal asphyxia was seen in 8/35 (22.9%) cases which is comparable to conducted by Thakur A where incidence was 30% .In contrast, Deshmukh V observed perinatal asphyxia in 9% cases.[10,21] More fetal complications were seen in this study as most cases were terminated prematurely before 36 weeks of gestation i.e. 21/35 (60%) which involved 12 (57.1%) cases of pre-eclampsia, 7 (33.3%) cases of eclampsia and 2 (9.5%) cases of GHTN.

Conclusions

This study indicates that hypertensive disorders of pregnancy with thrombocytopenia are associated with heightened maternal and fetal morbidity. The primary maternal complications include MICU admission for monitoring after receiving the loading dose of MgSO4, HELLP syndrome, and PPH. Fetal complications encompass NICU admission, LBW, perinatal asphyxia, IUGR, and IUFD.

References

1. Arbor A. NHBPEP Report on High Blood Pressure in Pregnancy : A Summary. Aafp 2001;64(2):263-70.
2. Khan KS, Wojdyla D, Say L, Gümezoglu AM, Van Look PFA. WHO analysis of causes of maternal death: a systematic review. Lancet 2006;367:1066-74.
   DOI: 10.1016/S0140-6736(06)68397-9
   PMID:16581405
3. Sibai BM. Diagnosis, prevention, and management of eclampsia. Obstet Gynecol 2005;105(2):402-10.
   DOI: 10.1097/01.AOG.0000152351.13671.99
   PMID:15684172
4. Habas E, Rayani A GR. Thrombocytopenia in hypertensive disease of pregnancy. J Obs Gynecol India 2013;63(2):96-100.
   DOI: 10.1007/s13224-012-0257-2
   PMID:24431613 PMCID:PMC3664679
5. Gupta A, Gaur BS, Mishra KB, Dubey I. A comparison of platelet count in severe preeclampsia, mild preeclampsia and normal pregnancy. Int J Res Med Sci 2018;6(2):671.
   DOI: 10.18203/2320-6012.ijrms20180318
6. Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. Am J Obs Gynecol. 2000;1(183):s1-22.
   DOI: 10.1067/mob.2000.107928
   PMID:10920299
7. Weinstein L. Syndrome of hemolysis, elevated liver enzymes, and low platelet count: A severe consequence of hypertension in pregnancy. Am J Obstet Gynecol 1982;142(2):159-67.
   DOI: 10.1016/S0002-9378(16)32330-4
   PMID:7055180
8. Burrows RF. Thrombocytopenia in the hypertensive disorders of pregnancy. Hypertens Pregnancy 1990;B9(2):199-209.
   DOI: 10.3109/10641959009072254
9. Tejeswini K.K ,Anitha G.S , Nandagopal K.M. Platelet count as a prognostic indicator in pregnancy induced hypertension. Int J Reprod Contracept Obs Gynecol 2016;5(4):1036-46.
   DOI: 10.18203/2320-1770.ijrcog20160854
10. Deshmukh barsha, Nasrin Aulia GS. Thrombocytopenia in hypertensive disorder of pregnancy:maternal and perinatal outcome. New Indian J OBGYN 2022;8(2):233-9.
    DOI: 10.21276/obgyn.2022.8.2.15
11. Singh A, Chawla S, Pandey D, Jahan N, Anwar A. Fetomaternal Outcome in Cases of Pre-eclampsia in a Tertiary Care Referral Hospital in Delhi, India: A Retrospective Analysis. Int J Sci Study 2016;4(2):100-3.
12. Vinodhini R, Kumari L. IJMRR Evaluation Of Platelet Count As A Prognostic Index In Eclampsia And Preeclampsia International Journal Of Modern Research And Reviews. Int J Modn Res Revs 2014;2(10):447-52.
13. Sultana F, Parthiban R SS. Thrombocytopenia in pregnancy induced hypertension. J Med Sci Heal 2015;1(2):19-24.
    DOI: 10.46347/JMSH.2015.v01i02.004
14. Choudhary P. Eclampsia:a hospital based retrospective study. Kathmandu Univ Med J 2003;1(4):237-41.
15. Saleh F, Din SSU, Soomro N. Serum uric acid as predictor model for pre eclampsia. PJS-Pakistan J Surg. 2019;26(3):246-51.

16. Rani Singhal S, Nanda S. Maternal and Perinatal Outcome in Severe Pre-eclampsia and Eclampsia. South Asian Fed Obstet Gynecol 1(3):25-8.
DOI: 10.5005/jp-journals-10006-1005

17. Sameer DMA, Meshram DDP, Deshpande DSA, Sadhu DD, S DP. Role of Platelet count as important prognostic marker in Pregnancy Induced Hypertension. IOSR J Dent Med Sci 2014;13(4):39-43.
DOI: 10.9790/0853-13433943

18. Riaz S, Habib S, Jabeen A. Frequency of maternal mortality and morbidity in pregnancy-induced hypertension. J Ayub Med Coll Abbottabad 2011;23(4):61-3.

19. Rahim R, Nahar K KIA et al. Platelet count in 100 cases of pregnancy induced hypertension. Mymensingh Med J 2010;19(1):5-9.

20. Khosravi S, Dabiran S, Lotfi M, Asnavandy M. Study of the Prevalence of Hypertension and Complications of Hypertensive Disorders in Pregnancy. Open J Prev Med 2014;04(11):860-7.
DOI: 10.4236/ojpm.2014.411097

21. Thakur A, Dangal G. Fetomaternal Outcome in Women with Pregnancy Induced Hypertension versus Normotensive Pregnancy. J Nepal Health Res Counc 2020;17(4):495-500.
DOI: 10.33314/jnhrc.v17i4.2103
PMID:32001855