

Thrombocytopenia in Hypertensive Disorder of Pregnancy in Bundelkhand Region

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Abstract

Introduction: Thrombocytopenia in pregnancy is defined as a platelet count less than 150,000/ μ L. Gestational thrombocytopenia is the most common cause of thrombocytopenia in pregnancy. It accounts for 80% of cases hypertensive disorders (preeclampsia, eclampsia, HELLP syndrome) is the second most common cause of thrombocytopenia in pregnancy. Thrombocytopenia may occur before the development of hypertension or may occur without it. It occurs in 17-50% of preeclamptic women. Lot of evidence suggest the role of platelet in the development of pre-eclampsia and intrauterine growth retardation.

Objective of Study: (1). Prevalence of thrombocytopenia in hypertensive disorder of pregnancy in our set up. (2). Implication of thrombocytopenia on maternal and fetal outcome, in pre-eclampsia and eclampsia

Method and Material: It is a retrospective study. In this study, we analyzed 189 pregnant women with hypertensive disorder of pregnancy, delivered in Bundelkhand Medical College Sagar from Jan.2019 to Jan.2020. Their age, parity, platelet count, Hb%, LFT, coagulation profile, method of delivery and fetal outcome analyzed.

Result: 147, (77.77%) primiparous and 42, (22.22%) multiparous. 49, (25.92%) women have anaemia. 27, (14.28%) had alter liver function test. 42, (22.22%) patients had thrombocytopenia. 21 (11.11%), had derail coagulation profile. 09, (4.7%) maternal death, 33 (17.46%) intrauterine death reported. Out of 33 IUD that occur in pregnancy induced hypertension patients, 25(75.75%) had thrombocytopenia. Out of 60 of eclampsia patients, 25(41.66%) had thrombocytopenia. chi square test value= 66.29 and p value= < 0.0001 . it means there is an association between platelet count and fetal outcome.

Conclusion: Thrombocytopenia occurs only small percentage (13.17%) of preeclampsia patients. Even in those pre- eclampsia pregnancies in whom thrombocytopenia occur, only small percentage (11.11%) have bleeding disorder. Thus, we can conclude that thrombocytopenia is not a major complication in majority of pre-eclampsia patients. But still careful, management of labour and puerperium is recommended.

Keywords: Pre- eclampsia, Eclampsia, thrombocytopenia, intra uterine fetal death.

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Introduction:

Platelets are nonnucleated cells. They derived from megakaryocytes in the bone marrow. Normally platelet live in the peripheral circulation for about 10 days. In non-pregnant person the normal platelet range is 160 to 415/ μ L [1]. Thrombocytopenia in pregnancy is defined as a platelet count less than 150.000/ μ L [2,3]. But usually, patients remain asymptomatic unless platelet count reach to very low level. In adult, Transfusion is recommended in individual undergoes major surgery have platelet count less than 50 thousand/ μ L [4]. The platelet count should be >50.000 platelets/ μ L for safe vaginal or cesarian section. For safe epidural anesthesia the reference value is 75-80/ μ L [5]. the risk of spontaneous bleeding become high only once platelet count below 10 thousand / μ L. [6].

Gestational thrombocytopenia is the most common cause of thrombocytopenia in pregnancy. It accounts for 80% of cases. [1-4]. The etiology is unknown, but it is believed to be due to the relative hemodilution of pregnancy, and increase destruction of platelets in the placenta [7,8] Gestational thrombocytopenia occurred in 2nd to 3rd trimester, platelet counts > 75thousand / μ L [4,9] , asymptomatic with no bleeding history, no history of thrombocytopenia before pregnancy and platelet counts return to normal 1 to 2 months post-partum, the incidence of fetal or neo- natal thrombocytopenia in the setting of gestational thrombocytopenia is low. Thus,

there is no significant maternal or fetal risk in women with gestational thrombocytopenia.

The other causes of thrombocytopenia in pregnancy are-Preeclampsia, HELLP syndrome, Primary immune thrombocytopenia, Secondary immune thrombocytopenia, Antiphospholipid syndrome, Systemic lupus erythematosus, Infection(such as human immune deficiency virus, hepatitis C, cytomegalovirus, Helicobacter pylori), Drug-induced thrombocytopenia(such as heparins, antimicrobials, anticonvulsants, analgesic agents), Association with systemic conditions (Disseminated intravascular coagulation), Thrombotic thrombocytopenia/hemolytic uremic syndrome, Splenic sequestration, Bone marrow disorders Nutritional deficiencies, Dengue .Among these, hypertensive disorders (preeclampsia, eclampsia, HELLP syndrome) is the second most common cause of thrombocytopenia in pregnancy[9]. Thrombocytopenia may occur before the development of hypertension or may occur without it. It occurs in 17-50% of preeclamptic women [10,11]. Lot of evidence suggest the role of platelet in the development of pre-eclampsia and intrauterine growth retardation. Various study suggest that platelet activation increased and their life span is reduced to below normal 10 days, in early pregnancy who later develop pre eclampsia.[12,13]

The aim of this study is to find out thrombocytopenia in hypertensive disorder

of pregnancy in our set up. We also try to find out low level of platelet count and its implication with pregnancy outcome.

Method and Material:

It is a retrospective study. In this study, after approval from institutional Ethical Clearance Committee, we analyzed 189 pregnant women with hypertensive disorder of pregnancy, delivered in Bundelkhand Medical College Sagar from Jan.2019 to Jan.2020.

Inclusion criteria:

Pregnancy beyond 37 weeks, delivered with blood pressure above 140/90 mmHg, and proteinuria during Jan.2019 to Jan. 2020 in Bundelkhand Medical College Sagar.

Exclusion criteria:

Women delivered with blood pressure below 140/90 mmHg, no proteinuria, preterm pregnancies, HIV, HbsAG, Hepatitis C positive.

Their age, detailed history of period of gestation, high risk factors, past history including past obstetric history, complications- during present and previous pregnancy, history of bleeding, viral infection, use of any drug, parity, platelet count, Hb%, LFT, coagulation profile, method of delivery, maternal and fetal outcome analyzed.

Study Area:

All pregnant women with hypertensive disorder of pregnancy, delivered in department of obstetrics and gynecology Bundelkhand Medical College Sagar.

Study design:

Hospital based retrospective study.

Study duration:

Jan.2019 to Jan.2020.

Estimation of sample size: 189.

Statistical analysis:

Quantitative variables like age, platelet count, etc. were expressed in terms of descriptive statics like mean and standard deviation. Qualitative variables were expressed in terms of proportion. The tests used for statistical calculations were as follows: 1) for the analysis of the difference between two proportions we used Chi-Square Test. 2) to test the significance of the difference between two proportions or percentages we used T-test. We used software version spss17.0

Result:

In our study of total 189 patients of hypertensive disorder of pregnancy, 129 had pre-eclampsia and 60 had eclampsia. 9 patients had HELLP syndrome (heamolysis, elevated liver enzyme levels, low platelet levels). 185 pregnancies were in age group between 18- 30 years and only 4 were >30 years old (elderly gravida). 147, (77.77%) primiparous and 42, (22.22%) multiparous. 49, (25.92%) women have anaemia. 27, (14.28%) had alter liver function test. 42, (22.22%) patients had thrombocytopenia. 21 (11.11%), had derail coagulation profile. 09, (4.7%) maternal death, 33 (17.46%) intrauterine death reported. 107 (56.61%) had normal vaginal delivery while 82(43.38%) required cesarian section. Out of 33 IUD that occur in pregnancy induced hypertension patients, 25(75.75%) had thrombocytopenia. Out of 60 Of eclampsia patients, 25(41.66%) had thrombocytopenia. Our null hypothesis(ho): there is no association between fetal outcome with platelet count (either ≥ 1.2 lacks or < 1.2 lacks). By applying chi square test value= 66.29 and p value= < 0.0001 . it means there is an association between platelet count and fetal outcome. Here our null hypothesis that there is no association, gets rejected.

Table 1: Relation between pregnancies with pregnancy induced hypertension and parity

Parity	Numbers	Percentage
Primiparous	147	77.7%
Multiparous	42	22.2%

Table 2: Relation of platelet counts and pre- eclampsia and eclampsia

Platelet count	Pre- eclampsia (Patients N.- 129)		Eclampsia (Patients N.- 60)	
	Number	Percentage	Numbers	Percentage
≥ 1.2	112	86.8%	35	53.8%
< 1.2	17	13.1%	25	41.6%

Table 3: Relation of thrombocytopenia and fetal out come in pregnancy induced hypertension pregnancies

Fetal outcome	Live N.- 156		Dead N.-33	
	Numbers	Percentage	Number	Percentage
Platelet count ≥ 1.2 lacks	139	89.1%	08	24.2%
Platelet count < 1.2 lacks	17	10.8%	25	75.7%

Discussion:

Hypertensive disorder of pregnancy includes group of high blood pressure disorders- Gestational hypertension, pre-eclampsia, eclampsia, superimpose on chronic hypertension and chronic hypertension. [14]. Gestational hypertension or pregnancy-induced hypertension (PIH), is the hypertension (systolic ≥ 140 or diastolic ≥ 90 mm Hg), develop after 20 weeks of gestation, on two occasions at least 4 hours apart, in previously normotensive person [15]. If patient develop proteinuria also than this condition known as pre- eclampsia. If left untreated, it may result in seizures at which point it is known as eclampsia. Chronic hypertension is high blood pressure that present before 20th week of pregnancy or 12th week post-partum checkup.

Maternal syndrome of pre- eclampsia occurs due to release of factor from placenta into systemic circulation [16]. Various types of factors, including pro-inflammatory cytokines, exosomes, anti-angiogenic agents, and cell-free fetal DNA, formed from

syncytiotrophoblast when they are under stress. These factors released into the maternal circulation are responsible for disruption of maternal endothelial function resulting in a systemic inflammatory response known as the clinical syndrome of pre-eclampsia. Uteroplacental malperfusion secondary to defective remodeling of the uterine spiral arteries is the main stress factor which perturb the syncytiotrophoblast to release these factors, in the early onset pre-eclampsia [17]. The different biochemical markers, such as maternal concentrations of angiogenic or anti-angiogenic factors, are being developed for early diagnosis and prediction of pre-eclampsia, and of related placental syndromes [18].

Systemic inflammatory response leads to vascular endothelial damage resulting thrombotic microangiopathy leads to platelet aggregation and thrombus formation in microcirculation. The thrombocytopenia is occurred due to platelet aggregation in microcirculation.

In our study we found that among all pre-eclampsia and eclampsia pregnancies, 77.77% were primiparous this finding is similar to the finding of Das S. et al. [19]. Where they found that in their study of pre-eclampsia patients, 64.7% were primiparous. Various study consistently demonstrated an elevated risk of pre-eclampsia among primiparous vs. multiparous women [20, 21]. Immune maladaptation may contribute to the primiparity-associated pre-eclampsia risk. [22,23]. The risk of pre- eclampsia is higher is women with previous history of pre-eclampsia than those with no such history but the majority of women with a history of pre-eclampsia will not have recurrent pre-eclampsia. The possible explanation of it may be due to immune adaptation' in subsequent pregnancies. Wolf M et. al. [25,26] in their study found that less favorable angiogenic factor profile and/or greater reactivity to insulin resistance in early pregnancy (at the end of the first trimester) may have relationship with the elevated risk of pre-eclampsia in first pregnancies.

Mangann et al. [27], found that overall incidence of thrombocytopenia in pregnancy is 8 %. Thrombocytopenia occurs commonly in patients with eclampsia (30 %) than in patients with both mild and severe forms of preeclampsia (15–18 %). This finding is similar to our study where we found that 13.13% of preeclampsia and 40.16% of eclampsia pregnancies had patient's thrombocytopenia.

25.92% pregnancies with pre- eclampsia and eclampsia had anaemia also. This finding is similar to Abde Aziem A Ali, et al. [28], that severe anaemia had a 3.6 times higher risk of preeclampsia than women with no anaemia The women with severe anaemia is more susceptible to develop pre-eclampsia , the possible explanation of it may be due to deficiency of micronutrient, reduction in serum levels of calcium, magnesium and zinc[29]. 11.11% had altered coagulation

profile. Late pregnancy shows a physiological hypercoagulable state with decreased levels of APTT, PT, and TT but in third trimester patients presented with pre-eclampsia present with super-hypercoagulable state along with the prolongation of APTT and TT [30]. But many authors found no correlation with clotting time with various severity of preeclampsia.

Quaker E et al. [31] found that at 3rd trimester more than seven-fold increased risk of fetal death in pregnancies with hypertension as compared to normal pregnancy. In our study we found 33 (17.46%) intrauterine death. Out of 33 intrauterine death (IUD) pregnancy in our study we found 25(75.75%) had thrombocytopenia. Chi square test value= 66.29 and p value= <0.0001 means there is an association between platelet count and fetal outcome. Thus, we found that pregnancy with hypertensive disorder with thrombocytopenia have greater risk of IUD as compared to the pregnancy with hypertensive disorder without thrombocytopenia

Conclusion:

Prevalence of pregnancy induced hypertension is high in primiparous pregnancy as compared to multiparous pregnancy so special attention has to be given in these group of pregnancies. Thrombocytopenia occurs only small percentage (13.17%) of preeclampsia patients. Even in those pre- eclampsia pregnancies in whom thrombocytopenia occur, only small percentage (11.11%) have bleeding disorder. Thus, we can conclude that thrombocytopenia is not a major complication in majority of pre-eclampsia patients. But still careful, management of labour and puerperium is recommended

Pregnancy with pre-eclampsia with thrombocytopenia have greater risk of intrauterine death as compared to the

pregnancy with pre-eclampsia without thrombocytopenia. Thus, thrombocytopenia itself is poor prognostic indicator for fetal wellbeing. But to use it as prognostic indicator for fetal wellbeing and whether improvement of platelet count have any impact on fetal outcome, required, further larger study.

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