Original Research Article

Evaluation of thrombocytopenia in pregnancy; Its effects on maternal and fetal outcome

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Abstract

Thrombocytopenia is an independent and important risk factor for the occurrence of maternal and perinatal complications. Thrombocytopenia is associated with high incidence of preterm deliveries, fetal distress and intrauterine growth restriction. Moderate to severe maternal thrombocytopenia points to a higher degree of severity of the primary disease, which increases perinatal complications. However, the adverse outcome is specifically attributed to preeclampsia, HELLP syndrome, and rare causes, while the perinatal outcome of GT and ITP is basically favourable. Pregnant women with thrombocytopenia have higher risk of bleeding excessively during and after childbirth, particularly they need to have caesarean section or other surgical intervention during pregnancy, labor, puerperium. Such bleeding complications are likely when platelet count is less than 150 $x10^9$/l. Hypertensive and hepatic disorders are the most common obstetric causes of thrombocytopenia. Mode of delivery was not affected by thrombocytopenia. Maternal morbidity and mortality was seen only in medical and obstetric thrombocytopenia. The low platelet counts and declining trend with increasing gestational age predispose Indian women to risk of thrombocytopenia and a routine platelet count is suggested. This study is designed to study causes of thrombocytopenia, the effect of maternal and fetal outcome.
Key Words: thrombocytopenia, pregnancy.

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Email: teju.nese@gmail.com
Received Date: 12/09/2017 Revised Date: 17/10/2017 Accepted Date: 04/11/2017
DOI: https://doi.org/10.26611/1012423

Access this article online

Quick Response Code:

Website: www.medpulse.in

Accessed Date: 14 November 2017

INTRODUCTION

Platelets are non-nucleated cellular fragments of megakaryocytes, they play a key role in hemostasis. Thrombocytopenia is defined as a platelet count less than 150 x 109/l, caused by accelerated platelet destruction or decreased production, is second only to anemia as the most common hematologic abnormality encountered during pregnancy 1 Which is characterized principally by bleeding from small vessels. The normal reference range of platelets in non- pregnant women is 150 -400 x 109/l. Due to hemodilution of plasma volume, platelet count may decrease by approximately 6%-7% occurs during 3rd trimester though absolute platelet count remains within normal reference range in most patients. Thrombocytopenia can be classified as
Mild - 100–150x 109/l,
Moderate - 50–100 x 109/l
Severe with less than 50 x 109/l.[1]
In pregnancy, most cases are due to gestational thrombocytopenia, idiopathic thrombocytopenic purpura or pre-eclampsia. Thrombocytopenia is observed in 6 to 15% of pregnant women at the end of pregnancy, and is usually moderate. Its prevalence at the end of pregnancy is between 6.6% and 11.6% 2-4. Gestational thrombocytopenia is the most common cause of thrombocytopenia during pregnancy. Thrombocytopenia which need to be investigated are the following: thrombocytopenia known before pregnancy, thrombocytopenia occurring during the 1(st) and 2(nd) trimester, platelet count <75 G/l in the 3(rd) trimester or thrombocytopenia in case of pregnancy with complications. Investigations have to be discussed in function of history and clinical examination, gestational age and severity of thrombocytopenia.

How to site this article: S Vanaja, Mahalaxmi, Tripura Sundari. Evaluation of thrombocytopenia in pregnancy; Its effects on maternal and fetal outcome. *MedPulse – International Journal of Gynaecology.* November 2017; 4(2): 31-36. http://medpulse.in/Gynacology/index.php

Causes of thrombocytopenia in pregnancy

1. **Reduced production**
   - Congenital
   - Precursor deficiency
   - Marrow failure
   - Malignancy
2. **Increased consumption**
   - Idiopathic (auto-immune) thrombocytopenia(M, F)
   - Pre-eclampsia/eclampsia (M)
   - Thrombotic thrombocytopenic purpura(M)
   - Disseminated intravascular coagulopathy (M)
   - Drugs including heparin (M)
   - Alloimmune thrombocytopenia F (M)
   - M = disease process causes thrombocytopenia in mother;
   - F = disease process causes thrombocytopenia in fetus.

Table 1:

Pregnancy Specific	Not Pregnancy Specific
Gestational thrombocytopenia	Primary immune thrombocytopenia
Preeclampsia/Eclampsia	Secondary immune thrombocytopenia
HELLP syndrome	Viral infection (HIV, Hep C, CMV, EBV, others0
Acute fatty liver	Autoimmune disorders (SLE, others)
	Antiphospholipid antibodies
	Thrombotic microangiopathies
	Thrombotic thrombocytopenic purpura
	Hemolytic urenic syndrome
	Disseminated intravascular coagulation (DIC)
	Bone marrow (MDS, myelofibrosis)
	Nutritional deficiencies
	Drugs
	Type IIB v WD induced thrombocytopenia
	Inherited thrombocytopenia (May-Heggglin, etc)
	Hypersplenism

MATERIALS AND METHODS

Inclusion Criteria

1. The records of pregnant women with proved platelet abnormalities
2. Normal pregnancy at 2nd-3rd trimester.
3. All pregnant women who gave the informed consent and detailed history and met the inclusion criteria.

Exclusion Criteria

1. The records which are not properly maintained.
2. The records of patients in whom the treatment was discontinued half way through.
3. Previous pregnancy with thrombocytopenia.
4. Medical diseases associated with pregnancy such as SLE, hypertension, hepatitis, HIV infection, presence of spleenomegaly
5. Patients on steroid, NSAIDS therapy and who underwent splenectomy.

Method of Study

Study Design: Prospective Study
Study Period: August 2012 to July 2014
Study Area: Department of Obstetrics and Gynaecology, GANDHI HOSPITAL
Study Sample: 75

OBSERVATION AND RESULTS

Total 75 cases selected according to platelet count at admission and presenting complaints are noted, the cases are followed up for any changes in platelet count and assossiated complaints. Any complications during delivery and maternal and fetal outcome arenoted

Patient demographic characteristic's

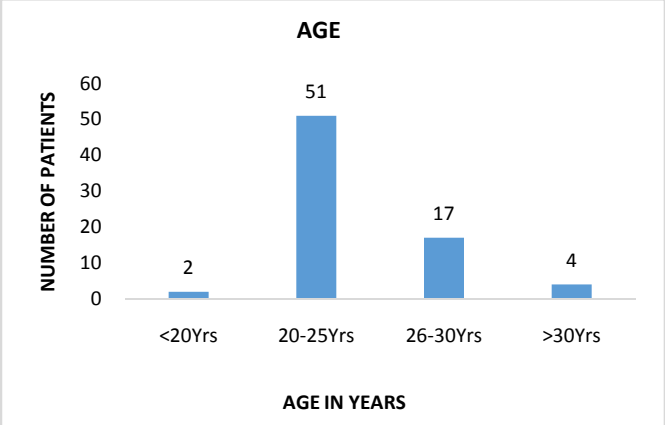

Figure 1: Showing age distribution in thrombocytopenic patients

50 cases fall in age group of 20 to 25 years, thrombocytopenia is most common among age group 20 to 25 years.

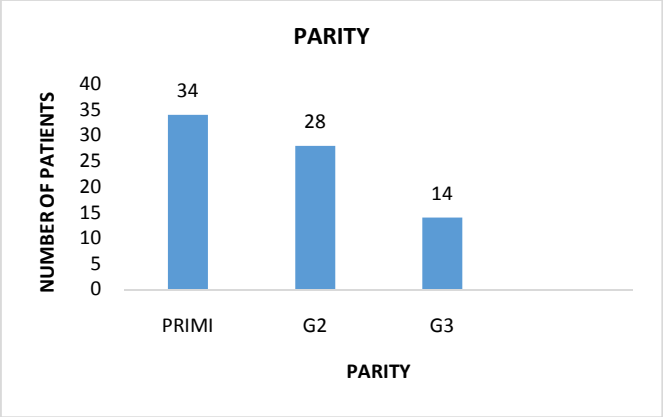

Figure 2: Showing distribution of parity in thrombocytopenic patients

Cases are primigravida, 28 cases 2nd gravida and 14 cases are 3rd gravida. The mean platelet counts in gestational, obstetric and medical thrombocytopenia were 113,000, 105,000 and 53,850 ll-1, respectively. Women with medical thrombocytopenia had significantly. (P\0.001) lower mean platelet count as compared to other causes of thrombocytopenia.

Platelet Count and Transfusions: Fresh frozen plasma infusion can be used for reversal of anticoagulant effects. Platelet transfusion is indicated to prevent hemorrhage in patients with thrombocytopenia or platelet function defects. Cryoprecipitate is used in cases of hypofibrinogenemia, which most often occurs in the setting of massive hemorrhage or consumptive coagulopathy.

Table 2: Out of 75 patients 41 required trasfusions

	Transfusions+(n=41)	Transfusions-(n=34)
Mean platelet count	86,439mm3	1,13,352mm3
Standard deviation	33,261	25,150

Z is 3.99 and P value is < 0.05. As P value is <0.05 which means it is significant, so there is significant relationship between thrombocytopenia and tansfusion.

Thrombocytopenia and Maternal Outcome: PPH is the most common complication other complications include DIC, multiple organ failure, maternal death etc. According to this study 16 cases had complications which included PPH, Liver failure, CCF, psychosis, renal failure, sepsis, DIC,4 maternal deaths.

Table 3: Maternal deaths were 4 which comes up to 5.33%.

	Good maternal outcome	Bad maternal outcome
Mean platelet count	91,411mm3	1,02,482
Standard deviation of platelet count	37,240	2,8754

The mean platelet count for maternal complications is 1,02,482mm3, standard deviation 28,754. Z is 1.13 and p value is >0.05 which means it is not significant, So according to this study, thrombocytopenia is not directly related to maternal outcome, there are also other factors which influence the maternal outcome like anemia, preeclampsia, sepsis etc. thrombocytopenia is a additional factor and not independent factor According to study conducted by dhakad amita (2011)Incidence of PPH was 9.89% among cases. PPH was seen in 30% of medical, 15% of obstetric and only 4.92% of gestational thrombocytopenia. Incidence was significantly higher in medical thrombocytopenia (P = 0.008). Three cases of obstetric and two of medical thrombocytopenia died during the study giving a mortality rate of 5.26%. Significantly higher mortality (P = 0.009) was seen in these cases as compared to GT that showed nil mortality.

Thrombocytopenia and Fetal Outcome: Neonatal complications is not directly related to maternal platelet count. The fetal complications occur in cases of preterm delivery, abruption, thrombocytopenia assossiated with anemia, sepsis. Fetal platelet count was done in 2 cases of ITP out of which one case had thrombocytopenia. None of the babies had bleeding complications. In this study fetal deaths were 13, NICU admissions were 21. Babies with birth weight < 1.5 kgs = 9,
1.5kgs to 2 kgs =10
2 kgs to 2.5kgs = 18
>2.5kgs = 39

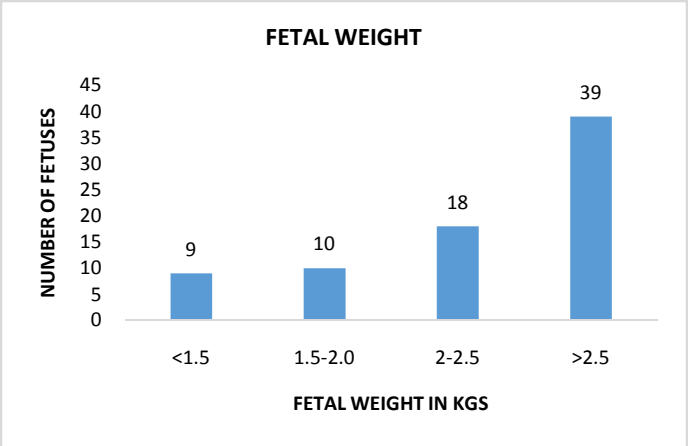

Figure 3: Showing fetal weight in thrombocytopenic patients

Etiology of Thrombocytopenia: According to study conducted in Gandhi hospital hypertensive disorders causing thrombocytopenia is the most common etiology which included 42% of cases, next common is gestational thrombocytopenia which included 29% of cases.

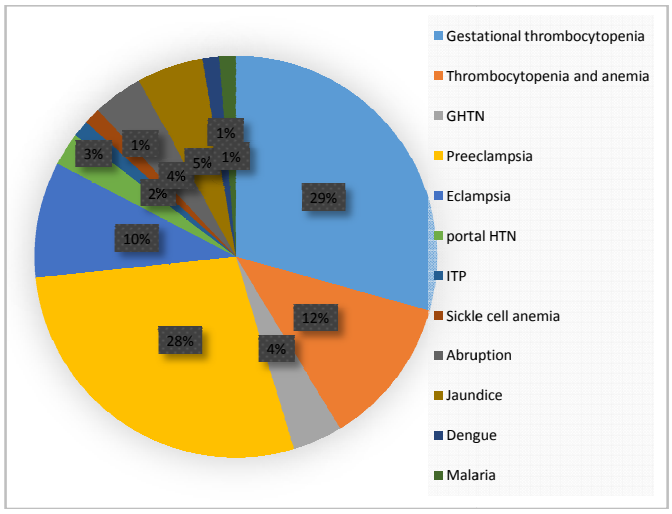

Figure 4: Showing etiology of thrombocytopenia

Table 4: Distribution of thrombocytopenia cases according to etiology

Sr. No.	Cause	No. of cases	%
1	Gestational	61	64.21
2	Obstetric	21	22.11
(a)	Hypertensive disorders	20	21.05
	PET	19	20.0
	Eclampsia	1	1.05
(b)	DIC	1	1.05
3	Medical	13	13.68
(a)	Hypersplenism	2	2.11
	Hepatic diseases	3	3.17
(c)	Malarial	2	2.11
(d)	Megaloblastic anemia	1	1.05
(e)	ITP	5	5.26

As the reference cases are more in Gandhi hospital and most cases of gestational thrombocytopenia are undetected as no major complications are observed in gestational
thrombocytopenia.

Severity of Thrombocytopenia

Thrombocytopenia is classified as
Mild - 100–150x 109/l,
Moderate - 50–100 x 109/l
Severe with less than 50 x 109/l.(1)
According to the study
<50,000mm3 = 10 cases
50,000mm3 to 1,00,000mm3 = 26 cases
1,00,000mm3 to 1,50,000mm3 = 40 cases

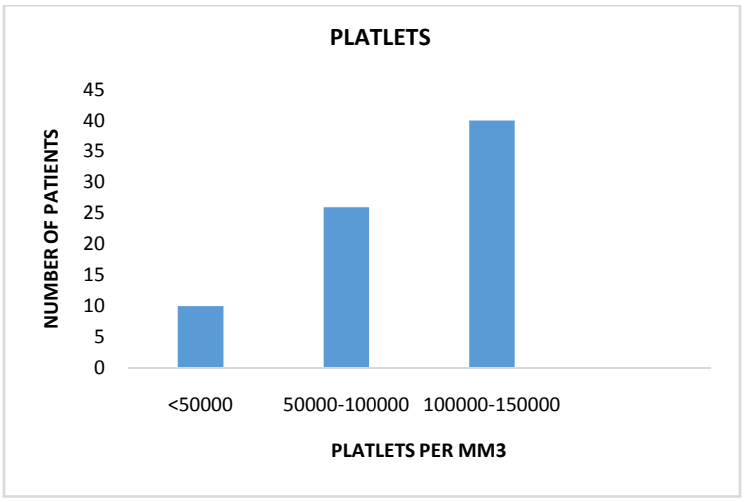

Figure 5: Showing platelet count in patients of thrombocytopenia

Thrombocytopenia and Mode of Delivery And Gestational Age at Delivery: According to study 15 cases delivered between 28 to 32 weeks 16 cases delivered between 32 to 36 weeks and 45 cases delivered at term. 60 % of cases delivered at term, those who delivered before term were mostly due to abruption or pregnancy was terminated for obstetric indications like severe preeclampsia, antepartum eclampsia, abruption or medical indications.

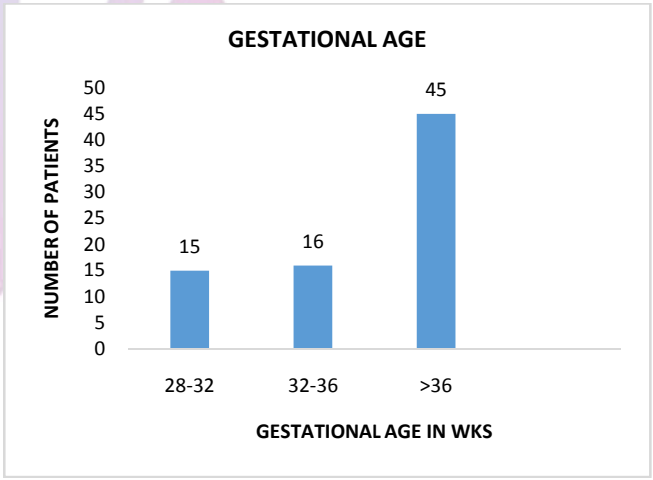

Figure 6: Mode of delivery is not influenced with platelet count

60 % cases delivered by LSCS and 40% by SPVD LSCS was done for obstertric and medical conditions like previous LSCS, fetal distress, failed induction and not for thrombocytopenia.

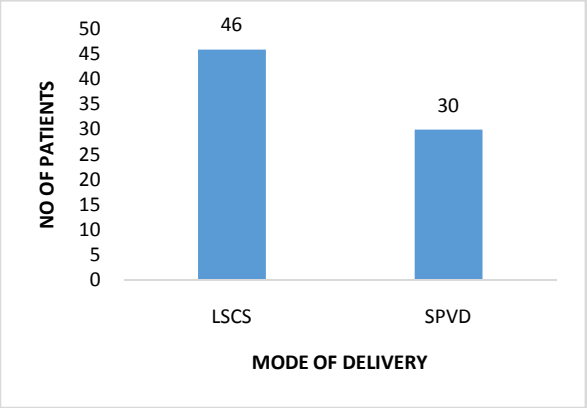

Figure 7: Mode of delivery

CONCLUSION

GT is the most common cause of thrombocytopenia during pregnancy (70%), but other underlying causes must be considered as well. A thorough history and physical examination will rule out most causes. Look at the remainder of CBC and smear to rule out pancytopenia and platelet clumping associated with pseudothrombocytopenia. If no antecedent history of thrombocytopenia is present and platelet counts are above 70,000/mcL, the condition is more likely to be GT. If platelet counts fall below 50,000/mcL or if a pre-existing history of thrombocytopenia is present, the condition is more likely to be ITP. Direct or circulating antiplatelet antibodies has no utility in the workup of thrombocytopenia in pregnancy because they usually are nonspecific and will not distinguish GT from ITP. Follow platelet counts every 1-2 months or more frequently if the patient is symptomatic. Cesarean deliveries should be reserved for obstetrical indications only because abdominal delivery itself has not been demonstrated to be a cause for intracranial hemorrhage. Invasive procedures to determine fetal platelet counts (scalp sampling, PUBS) no longer are considered necessary because an infant who is thrombocytopenic may be delivered abdominally. With ITP, obtain cord blood at delivery for platelet count and notify the pediatricians to assess neonatal platelet counts due to the risk for continued quantitative platelet decline and postnatal hemorrhage. For GT, document normalization of maternal platelet counts after delivery.

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Source of Support: None Declared
Conflict of Interest: None Declared