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Maternal and fetal outcome among pregnant women presenting with thrombocytopenia

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Abstract
Background: Thrombocytopenia is defined as platelet count less than 150000/µL.1,2 It is second only to anemia as the most common haematological abnormality encountered during pregnancy. Thrombocytopenia is encountered in 7-8% of all pregnancies but when patient's obstetric and medical condition are excluded, incidence down to 5.1%.
Methods: This prospective observational study was conducted in the department of Obs & Gynae at Government Medical College & J. K. Lon hospital, Kota over a period of 1 year. Out of 2897 women, 1500 women willing to participate in the study and fulfilled our inclusion criteria. Out of 1500 women screened,100 women were found to have thrombocytopenia.
Results: Prevalence of thrombocytopenia was 6.67%. The distribution of thrombocytopenia with etiology is 56% with gestational thrombocytopenia,35% including pre-eclampsia, HELLP syndrome, eclampsia, gestational hypertension and superimposed pre-eclampsia and 9% including DIC, ITP, Dengue and Malaria and hypersplenism. Mean gestational age was 38.42±1.69 weeks.53% women delivered vaginally and 47% had delivered by LSCS. 42% patients needed blood and blood products transfusion and 58% patients no blood transfusion. Newborn 76.47% (78) had normal birth weight and 23.53% (24) had low birth weight with mean birth weight 2.58±0.49kg.33(31.35%) neonates required NICU admission and 68.65% (69) newborns were healthy. Out of 102 neonates, 94.12% (96) had normal platelet count and 5.88%(6) had thrombocytopenia. Neonatal mortality3.92% (4) neonates.
Conclusions: Most common cause of thrombocytopenia during pregnancy was gestational thrombocytopenia but other underlying causes must be considered as well. A careful examination and simple laboratory test are needed so that a serious condition that may require specific and urgent management (examples HELLP syndrome, severe pre-eclampsia, TTP, HUS, AFLP) is not missed. Management of pregnant women with platelet disorders requires a multidisciplinary approach.

Keywords: Thrombocytopenia, DIC, HELLP syndrome

Introduction

Thrombocytopenia or low blood platelet count is encountered in 7-8% of all pregnancies But when patient‟s obstetric and medical condition are excluded, incidence down to 5.1%. Obstetricians diagnose thrombocytopenia by automated complete blood cell counts during routine prenatal screening.3 It can result from a wide range of conditions, several of them being pregnancy related [1].

The normal range of platelets in non-pregnant women is 150,000- 400,000/µL. Average platelet count in pregnancy is decreased (2,13,000/µl versus 2,50,000/µL). Decrease in the platelet count is due to hemodilution, increased platelet consumption, and increased platelet aggregation driven by increased levels of thromboxane A2. Clinical assessment is most important factor for evaluation of pregnant patient with thrombocytopenia. Proper medical history

Including current and previous bleeding problem, family history, transfusion history etc should be taken.

Examination findings suggestive of thrombocytopenia include the following: petechiae, ecchymosis, nose and gum bleeding, hematuria. The etiologic classification for thrombocytopenia can be divided into [2] broad categories: Obstetric (gestational thrombocytopenia, hypertensive disorders, DIC,• multi-fetal gestation etc). Non-Obstetric (ITP, hypersplenism, hepatic disorders, Iatrogenic etc).•

Material and Methods

Study design
Prospective observational study

Study setting
Department of obstetrics & gynaecology at Government Medical College & J. K. Lon hospital Kota

Period of study - 1 year (Jan 2020- Dec 2020)

Study population
Pregnant women with singleton pregnancy with period of gestation 28 week onwards who attended ANC & found to have thrombocytopenia after screening. The study was performed after the approval of ethic committe of institute.
Sample size 100 patients were included in study.

Inclusion criteria
All pregnant women with platelet count less than 1,50,000/µL who were willing to participate in the study were enrolled for study after period of gestation 28 week.

Exclusion criteria
Women with known history of
- Diabetes mellitus
- Collagen disorders
- Tuberculosis
- Epilepsy
- Previous bad obstetric histories
- Pancytopenia
- Bone marrow suppression

Methodology
Antenatal women were enrolled in the study in third trimester. All women had platelet count estimation at the time of enrollment. Platelet count assessment was done through automated blood count analyser with routine antenatal haematological evaluation of the patient.
Baseline investigations like complete haemogram, blood group and Rh typing, O"Sullivan"s test, urinalysis, VDRL, HBsAg and HIV serology were carried out in all subjects. Special investigations like Coagulation profile (PT, APTT, FDP and fibrinogen), KFT, LFT were done if clinically indicated. Any other investigation was done as and when required.
The detailed work up of all cases was done to ascertain the cause of thrombocytopenia. All women enrolled were follow up by estimation of platelets count on 7th postpartum.

Statistical analysis
Quantitative data was summerized as mean and standard deviation where as qualitative data was presented as proportion (%).
One-Way ANOVA test ("analysis of variance") and Post hoc Bonferroni test were used for analysis of quantitative data while Chi-square test was used for analysis of qualitative data.
P value < 0.05 was taken as significant.
Medcalc 16.4 version software was used for all statistical calculation

Prevalence of Thrombocytopenia
Study population- 1500
Sample size- 100
Prevalence of thrombocytopenia in this study 6.67%

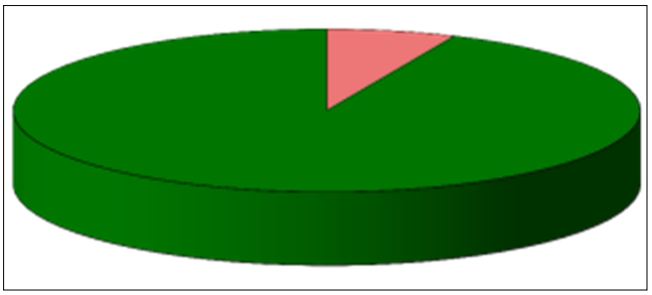

Table 1: Distribution of patients according to gestational age

Gestational Age	No.	%
<37 Week	15	15.00
37-40 Week	71	71.00
>40 Week	14	14.00
Total	100	100.00

Table 2: Distribution of patients according to etiology

Diagnosis	No. of patients	%
Gestational Thrombocytopenia	56	56.00
Hypertensive Disorder of Pregnancy		
1) PE	15	15.00
2) HELLP	8	8.00
3) GHTN	7	7.00
4) Eclampsia	3	3.00
5) Superimposed PE	2	2.00
Others		
1) Dengue	3	3.00
2) Hypersplenism	3	3.00
3) DIC	1	1.00
4) ITP	1	1.00
5) Malaria	1	1.00
Total	100	100.00

Table 3: Distribution of patients according to relation with other medical illness

Associated illness	No.	%
Anaemia	23	23.00
Hypothyroidism	8	8.00
Chronic Hypertension	2	2.00
Liver Disorder	1	1.00
No other illness	66	66.00
Total	100	100.00

Table 4: Relation of severity of thrombocytopenia with blood and blood products transfusion

Blood and blood products transfusion	Severity of Thrombocytopenia						Total	
	Mild		Moderate		Severe			
	No.	%	No.	%	No.	%	No.	%
Absent	33	71.74	25	52.08	1	12.50	59	57.84
Present	13	28.26	23	47.92	7	87.50	43	42.16
Total	46	100.0	48	100.0	8	100.0	102	100.00

Chi-square = 11.237 with 2 degrees of freedom; P = 0.004

Table 5: Distribution of patients according to mode of delivery

Mode of delivery	No.	%
LSCS	47	47.00
NVD	53	53.00
Total	100	100.00

Table 6: Distribution of patients according to maternal complications

Postpartum Period (Adverse Event)	No.	%
PPH	14	14.00
DIC	2	2.00
DIC & Acute renal failure	2	2.00
DIC & Muscle Haematoma &Renal Failure & Maternal Death	1	1.00
Renal Failure	1	1.00
Wound sepsis	1	1.00
No	79	79.00
TOTAL	100	79.00

Table 7: Distribution of neonates according to platelet count

Neonatal Thrombocytopenia	NO.	%
Absent	96	94.12
present	6	5.88
Total	102	100.00

Discussion

In our study, Prevalence of thrombocytopenia was 6.67% which was comparable to study done by Sojitra M *et al.* [4] (7.1%), Vyas *et al.* [5] (7.6%), Burrows *et al.* [6] (7.6%) and Chauhan V *et al.* [7] (8.4%). Our prevelance was lower than other studies. we have excluded major systemic disease like diabetes, TB, Collagen disorders, Epilepsy, Pancytopenia, Bone marrow suppression and previous bad obstetrics history.

In our study, Mean gestational age was 38.42 ± 1.69 weeks which was similar to studies conducted by Chauhan V *et al.* [7] (38.6 ± 1.34weeks), Sojitra M *et al.* [4] (38 weeks) and Lin *et al.* [8] (39 weeks). Where as in the study by Bouzari *et al.* [9] the mean age was 35.83 ± 3.61 weeks which was lower than our study. In our study maximum cases 71% belonged to gestational age 37 to 40 week which was similar to Parnas *et al.* [10]. In our study, 53% women delivered vaginally and 47% had delivered by LSCS which was comparable, to study by Singh J *et al.* [11] (vaginally 52% and LSCS 48%), Sojitra M *et al.* [4] (vaginally 60% and LSCS 40%) and Vyas *et al.* [5] (vaginally 63% and LSCS 37%) whereas the incidence of LSCS was higher in the studies conducted by pafumi *et al.* 12(55%) and Yuce *et al.* [13] (56%). In our study, 42% patients needed blood & blood products transfusion and 58% patients needed no transfusion. However, need for blood and blood products transfusion was lower in the studies of Chauhan M *et al.* [7] (24.04%), Borna *et al.* [14] (26.20%) and Parnas M *et al.* [10] (16.6%). The requirement of blood in our study was due to fact that 23% womeb n were anaemic.

In our study, in mild thrombocytopenic blood and blood products transfusion was done to prevent complication like PPH. Thrombocytopenia per se not an indication for blood and blood products transfusion. In our study in moderate thrombocytopenia platelet transfusion was done in cases which require caesarean section. In our study, most common complication was PPH found in 14% patients. DIC in 2% patients, DIC with acute renal failure in 2% patients, Only Renal failure in 1%, Wound sepsis in 1%. In our study, incidence of PPH was higher as compared to studies reported by Tasneem *et al.* [15] (8.6%), Sumathy *et al.* [16] (7.1%) and Chauhan M *et al.* [7] (6.73%. because of obstretic causes (like prolonged labor, obstructed labor, abruption). In my study maternal mortality was 1% which was similar to study done by Sibai *et al.* [17] (1.1%). The mean weight of neonates born to the women enrolled in our study was 2.58 ± 0.49 kg which was similar to study by Bouzari *et al.* [9] (2.58 ± 0.8kg) whereas the mean weight was higher in study by Chauhan V *et al.* [7] (2.80 ± 0.32kg) and Onisai *et al.* [18] (2.9 ± 0.23 kg) as we included patients with hypertensive disorders (HELLP, preeclampsia, eclampsia, gestational hypertension and superimposed preeclampsia). Majority of newborn 76.47% (78) had normal birth weight and 23.53% (24) had low birth weight which was comparable to study reported by Chauhan V *et al.* [7] in which 92.3% had normal weight and only 7.7% had low birth weight. (31.35%) neonates required NICU admission. Majority of neonates admitted due to prematurity and its associated complications. Out of total 33 neonates, 39.4% (13) neonates had perinatal asphyxia, 36.4% (12) neonates had RDS,12.1% (4) neonates had sepsis, 9.09% (3) neonates had jaundice and 3.03% (1) neonate of ITP mother. In the study conducted by Vyas *et al.*, Chauhan M *et al.* [19] and Chauhan V *et al.* [7], 13.20%, 9.61% and 6.15% neonates required NICU admission respectively which is less as compared to our study due to poor antenatal care as majority of patients were referred. In our study, out of 102 neonates, 94.12% (96) had normal platelet count and 5.88% (6) had thrombocytopenia with platelet count less than 150000/mm3 which is comparable to study reported by Chauhan V *et al.* [7] in which incidence of neonatal thrombocytopenia was 3.10%. In the study by Singh *et al.* incidence was 1.09% which lower than our study. Incidence of fetal thrombocytopenia was higher in the studies of Yuce *et al.* [13] (14%) and Bhat *et al.* 19(36.10%). In our study, out of 102 neonates, Neonatal mortality were found in 3.92% (4) neonates which is comparable to the study of Parnas M *et al.* in which 2.5% patients had neonatal death. In study by Katke RD *et al.* 78 neonatal deaths occurred in 8.7% patients which higher than our study. In present study, out of 4 cases of neonatal mortality, 2 cases belonged to moderate thrombocytopenia group whereas 1 case in mild and 1 case in severe thrombocytopenia group the association of neonatal mortality with severe thrombocytopenia in our study was statistically insignificant.

Conclusion

Present study concluded that most common cause of thrombocytopenia during pregnancy was gestational thrombocytopenia but other underling causes must be considered as well. A detailed history and physical examination is mandatory to rule out most other causes. A thorough study of CBC and smear should be done to rule out pancytopenia and platelet clumping associated with pseudothrombocytopenia. Previous history of thrombocytopenia should rise the doubt of ITP. A careful examination and simple laboratory test are needed so that a serious condition that may require specific and urgent management (examples HELLP syndrome, severe pre-eclampsia, TTP, HUS, and acute fatty liver of pregnancy) is not missed. Monitoring of platelet count of mother should be a routine at antenatal visits for timely diagnosis and to achieve favorable obstetric outcome in all types of thrombocytopenia. Management of pregnant women with platelet disorders requires a multidisciplinary approach and accurate etiological diagnosis is essential for optimal therapeutic management.

Results

Prevalence of thrombocytopenia in this study- 6.67%. mean age group of antenatal mothers was 26.94 years with SD of 4.39. Patients ≤ 25 years constitute 42% of total cases, 26-30 years were 44%, 31-35 years constitute 9% and >35 years were 5%. 41% were Primi-gravida and 38% were second gravida and 21% were Multigravida. Mean gestational age was 38.42 ± 1.69 weeks. 15% were < 37 weeks ,71% were in 37 to 40 weeks and 14% were >40 weeks. Mean gestational age in mild thrombocytopenia was 38.94±1.32 weeks, in moderate thrombocytopenia 38.14 ± 1.68 weeks and in severe thrombocytopenia it was 37.07 ± 2.55 weeks. In our study 56%

were found to be Gestational thrombocytopenia, 15% were associated with Preeclampsia, 8% associated with HELLP syndrome, 7% associated with gestational hypertension. Hypersplenism, eclampsia, Dengue contributed equally 3%. Superimposed preeclampsia contributed to 2% DIC, ITP, Malaria contributed equally 1%. In our study, out of total 46 cases of mild thrombocytopenia, 34 cases (73.91%) were contributed by gestational thrombocytopenia, 10 cases (21.74%) by HDP and 2 cases (4.35%) by other causes. out of total 46 cases of moderate thrombocytopenia, 21 cases (45.65%) were contributed by gestational thrombocytopenia, 20 cases (43.48%) by HDP and rest 5 cases (10.87%) by other causes. Out of total 8 cases of severe thrombocytopenia, 5 cases (62.50%) were contributed by HDP, 2 cases (25%) by other causes and 1 case (12.50%) by gestational thrombocytopenia. In our study association of medical illness with thrombocytopenia showed anemia in 23%, hypothyroidism in 8% , Chronic hypertension and Liver disorder in 2% and 1% patients respectively.in our study 53% patients were delivered vaginally and 47% were delivered by LSCS. In our study 42% patients needed blood & blood products transfusion. Out of 8 severe thrombocytopenic patients, 87.50% (7) required blood and blood products transfusion with p value = 0.004 which is statistically significant. In our study, in severe group of thrombocytopenia, 62.50% patients required antihypertensive treatment. In our study, almost similar incidence of maternal complication occurred in mild, moderate and severe group of patients. Mean weight of neonates born to the women enrolled in our study was 2.58 kg with SD of 0.49 kg. The maximum weight was 3.5kg and minimum was 1.1kg. Of total 102 neonates, 31.35% (33) neonates were admitted in NICU and 68.65% (69) newborns were healthy and shifted mother side. Out of 102 neonates, 94.12% (96) had normal platelet count and 5.88% (6) had thrombocytopenia with platelet count less than 150000/mm3. Out of 102 neonates, Neonatal mortality were found in 3.92% (4) neonates. 4 neonatal mortality,2 in moderate thrombocytopenia,1 in mild and 1 in severe thrombocytopenia patients.

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