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Fetomaternal outcome in pregnancy with severe thrombocytopenia

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Abstract. – OBJECTIVES: STo study the fetomaternal outcome in pregnancy with severe thrombocytopenia.

MATERIALS AND METHODS: It was an observational study involving 1150 pregnant women with term gestation in labour, who were screened for thrombocytopenia. Ninety-four subjects (8.17%) were found to have thrombocytopenia i.e. platelet count < 1,50,/000/mm^3, out of which 47 subjects (group A) had platelet count of less than 50.000/mm^3 Simultaneously, 47 term pregnant women (group B) having a normal platelet count i.e. > 1.5 lac/mm^3 formed the control group. All the subjects were followed during labour and postpartum period for any feto-maternal outcome.

RESULTS: Significant history of bleeding tendencies like prolonged bleeding from wound site, easy bruisability and menorrhagia (p = 0.023) was evident in the study population. Abruptio placentae and early onset pregnancy induced hypertension (PIH) in previous gestations was more commonly found in the study population. Anemia and PIH were significantly more in group A. Incision site oozing during cesarean section was significantly more in group A. Moderate thrombocytopenia was more in neonates of study group (p = 0.014), but without any bleeding complications in neonates.

CONCLUSIONS: Careful surveillance is required in these high risk patients for earlier detection and treatment of complications so as to decrease the fetomaternal morbidities.

Key Words:
Thrombocytopenia, Anemia, Pregnancy.

Introduction

Thrombocytopenia complicates 7-8% of all pregnancies, most of which is seen in the third trimester of pregnancy. Maternal thrombocytopenia is commonly diagnosed during routine prenatal complete blood count. Obstetricians need to rule out pathological causes of thrombocytopenia by judicious use of investigative modalities, so that unforeseen fetomaternal complications can be predicted and managed.

There is a dearth of literature on the fetomaternal outcome in pregnant women with severe thrombocytopenia especially from Indian subcontinent. This study has investigated the spectrum of causes of severe thrombocytopenia in Indian obstetrical population and its effect on fetomaternal outcome.

Material and Methods

The Ethics Institutional Review Board approved the study.

It was an observational work involving 1150 pregnant women with term gestation in labour, who were screened for thrombocytopenia with a complete blood count and peripheral smear. Ninety-four subjects (8.17%) were found to have thrombocytopenia i.e. platelet count <1,50,000/mm^3, out of which 47 subjects (group A) had platelet count of less than 50,000/mm^3 on CBC by coulter machine as well as on peripheral smear were further followed for fetomaternal outcome. Simultaneously, 47 term pregnant women (group B) having a normal platelet count i.e. >1.5 lac/mm^3 and in labour were selected to form the control group.

In both the groups detailed history and thorough general physical, systemic and obstetrical examination were performed. To find the plausible etiology, all subjects were investigated for bleeding time, clotting time, clot retraction time, HBsAg, VDRL, HIV, glucose challenge test, liver function test, kidney function test, serum electrolytes, PT/PTTK, urine routine and microscopy and obstetrical ultrasound. Lupus anticoagulant antibody (LAC), anticardiolipin antibody (aCL) and antinuclear antibody (ANA) were also done by ELISA method. All the subjects were followed during labour and postpartum period for 6 weeks and feto-maternal complications were as-

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certained. A repeat complete blood count was performed at 6 weeks to ascertain the evolution of thrombocytopenia. At delivery, cord blood sample was collected to evaluate the effect of maternal thrombocytopenia on fetal platelet count. All newborn babies were evaluated at birth and were observed up to first 7 days of life for any bleeding complications.

Statistical Analysis

The observations were tabulated on Microsoft excel sheet and results were analyzed applying SPSS software (SPSS Inc., Chicago, IL, USA). p value < 0.05 was considered significant.

Results

The study and the control groups had comparable age, gravidity and period of gestation (Table I). In both the groups coincidently, 15 (31.91%) were primigravidae.

In group A, significant history of bleeding tendencies like prolonged bleeding from wound site, easy bruisability etc was noted in 10.64% compared to none in group B ($p = 0.023$). Significant number of pregnant women in group A had history of menorrhagia (12.77% vs. 0%, $p = 0.012$). Eight women (17.02%) in group A gave history of ingestion of antiplatelet drugs in the recent past out of which 2 had antiepileptic drugs, 2 were on diuretics and remaining 4 were on co-trimoxazole for treatment of urinary tract infection. Ten patients in group A showed positive LAC, aCL and ANA. One patient was positive for all the three antibodies, 3 patients were positive for ANA and 6 positive for aCL and LAC both. Bleeding time, clotting time and CRT were normal in all patients.

Table II shows the association of various factors in the two groups. Anemia ($p = 0.03$) and pregnancy induced hypertension (PIH) ($p = 0.04$) are found to be more in group A. Out of 47 subjects in group A, 12 had PIH, 8 had anemia and 5 had both anemia and PIH. A statistically significant number of women gave history of abruptio placentae and early onset PIH in previous pregnancies; but no underlying cause of severe thrombocytopenia could be found in 21 (44.68%) subjects. Repeat platelet count performed at 6 weeks postpartum, revealed that thrombocytopenia had resolved in 28 subjects (59.6%). 17 women in group A were found to have mild thrombocytopenia (36.1%) and 2 women had moderate thrombocytopenia (4.25%). On further analyzing, thrombocytopenia resolved in 80% (4/5) patients who had anemia and PIH both, 75% (9/12) of PIH patients, 75% (6/8) patients of anemia, and 70% (7/10) patients who were either LAC, aCL or ANA positive. It was observed that five out of six women with history of menorrhagia had persistent thrombocytopenia after 6 weeks.

Table III shows the maternal complications observed in the current pregnancy. Incision site oozing was observed more in group A ($p = 0.04$).

In present study, 11 women with severe thrombocytopenia were transfused platelet concentrates. The range of platelets in these women was 32,000/mm^3 to 44,000/mm^3. Out of these 11 women, 4 patients had emergency caesarean, 5 patients had PIH with abruptio placentae and rest 2 had HELLP syndrome.

Parameters studied to observe the effect of maternal thrombocytopenia on fetal well-being included birth weight, Apgar score, fetal bleeding complications and cord blood platelet count. There was no significant difference found in the birth weight and Apgar score in the two groups. Although the fetal bleeding complications were not seen in any of the newborns in either group, but cord blood platelet counts were significantly different with 8 neonates in group A having platelet count < 1 lac/mm^3 as compared to only one neonate in the group B ($p = 0.014$). One of the mothers of these 8 neonates had anemia, PIH and positive immunological test, two mothers of these neonates had anemia and PIH, two had PIH only and rest three had no other risk factor.

On analyzing the data for the thrombocytopenia with obvious etiology and without etiology, fetomaternal outcome was not different in these two groups.

Table I. Patient characteristics of group A and B.

	Group A (N = 47)	Group B (N = 47)	p value
Age	24.48 ± 3.62	24.72 ± 3.65	0.75
Gravidity	2.15 ± 0.99	2.08 ± 0.88	1
Period of gestation	38.85 ± 1.47	38.57 ± 1.12	0.06

Table II. Association of various risk factors in study and control group.

Risk factors	Study group N = 47	Control group N = 47	*p* value
Anaemia	13 (27.65%)	5 (10.64%)	.03
PIH	20 (42.55%)	1 (2.13%)	.04
IUGR	7 (14.9%)	9 (19.15%)	0.59
Oligohydramnios	1 (2.13%)	6 (12.77%)	0.06
APH	2 (4.25%)	2 (4.25%)	1
IUD in present pregnancy	1 (2.13%)	1 (2.13%)	0.32
Bad obstetrical history (history of recurrent abortions, preterm deliveries and term IUD)	6 (12.77%)	2 (4.25%)	0.14
Past history of abruptio placentae	9 (19.15%)	2 (4.25%)	.03
Past history of early onset PIH	6 (12.77%)	0	.01
Past history of IUGR	3 (6.38%)	5 (10.64%)	.46
Past history of PPH	1 (2.13%)	0	.322
History of blood and component replacement	1 (2.13%)	2 (4.25%)	.56

Discussion

The prevalence of thrombocytopenia in pregnant women is approximately 10%[1]. There are very few studies comparing the outcome of pregnancies with severe thrombocytopenia[2,3] and moreover, the cut-off used for platelet count has been < 1 lac/mm^3. This is the largest study till date comparing the fetomaternal outcome in severe maternal thrombocytopenia i.e. platelet count less than 50,000/mm^3 from the Indian subcontinent. Thrombocytopenia was observed in 8.17% of pregnancies and severe thrombocytopenia in 4.08% in the present study. This frequency of severe maternal thrombocytopenia in our investigation is more than that reported in the literature (0.7% vs 1.1%)[1,2]. This may be due to high prevalence of anaemia (65%-75%) in pregnancy in India secondary to high rates of nutritional deficiencies prevalent in the Indian subcontinent[4].

Platelet count decreases by an average of 10% during the third trimester as a result of hemodilution or accelerated destruction leading to younger and larger platelets which have increased number of platelet granules that enhance platelet function[5]. This gestational thrombocytopenia does not usually require treatment if there is no bleeding tendency. However, in the presence of other bleeding diathesis, preexisting thrombocytopenia may worsen the condition. If surgical intervention cannot be avoided, platelet transfusion before a cesarean delivery may be recommended in severe maternal thrombocytopenia depending upon the cause and clinical setting.

The significant association found between presence of thrombocytopenia and bleeding tendencies in this study indicates that a detailed history can serve as an important tool to suspect thrombocytopenia or any bleeding disorder. In another study on women with menorrhagia, 47% demonstrated haemostatic abnormalities like thrombocytopenia, von Willebrand's disease, and other coagulation factor deficiencies[6].

Various risk factors that could lead to thrombocytopenia in pregnancy were evaluated in both study and control groups. A mix of the following risk factors namely, anaemia (27.65%), PIH (42.55%), past history of abruptio placentae (19.15%) and past history of early onset PIH (12.77%), were found to be significantly associated with presence of thrombocytopenia in the study population. No underlying cause was discernible in 44.68% of women with severe thrombocytopenia.

Table III. Maternal complications in current pregnancy.

Maternal complication	Study group N = 47	Control group N = 47	*p* value
PPH	2 (4.2%)	0	.15
Episiotomy haematoma	0	0	0
Bleeding from episiotomy site	1 (2.1%)	1 (2.1%)	1.
Incision site ooze in caesarean section	4 (8.4%)	0	.04
Hemoperitoneum	0	0	0

PIH (42.55%) was the most common risk factor associated with thrombocytopenia in this study which was inclusive of 1 case of eclampsia and 2 cases of HELLP syndrome. Cause of thrombocytopenia in PIH is platelet surface activation and aggravated platelet destruction[7].

Severe thrombocytopenia was not associated with any maternal complication except for incision site oozing. Similarly, no complications were observed in neonates, and the birth weight and Apgar score were also comparable in the two groups. However, statistically significant number of the neonates had a platelet count less than 1 lac/mm^3 (p = 0.014). This emphasizes that caution needs to be exercised while advising or doing invasive tests in the fetus in pregnant women with severe thrombocytopenia. This evidence of moderate neonatal thrombocytopenia is in contrast to many other reports which state that the severity of maternal thrombocytopenia is not predictive of fetal thrombocytopenia[8,9]. In a study by Parnas et al[2] 7/199 (3.51%) neonates had moderate to severe thrombocytopenia compared to 8/47 (17.02%) neonates in our work, possibly due to inclusion criteria of platelet count less than 1 lac/mm^3 rather than 50,000/mm^3 as in our study. Adverse perinatal outcome was reported in 23.1% among patients with severe thrombocytopenia compared to 16.2% among moderate thrombocytopenia, and 3.5% in controls (p < 0.001)[2]. This is in contrast to our research where no adverse perinatal outcome was observed.

Conclusions

Prevalence of severe thrombocytopenia in pregnant females in our study was 4.08%. PIH (42.55%), anaemia (27.65%), past history of abruptio placentae (19.15%) and past history of early onset PIH (12.77%) were found to be significantly associated with presence of thrombocytopenia in the study population. The fetomaternal outcome in group A was not adversely affected in general; however, the incision site oozing was present significantly more in the group A when the patient has been taken for cesarean section and statistically significant number of the neonates had platelet count less than 1 lac/mm^3 (p = 0.014) but without any bleeding complication in neonates. Careful surveillance is required in these high risk patients in order to ensure early detection and treatment of the complications; so as to decrease the fetomaternal morbidities.

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