ORIGINAL RESEARCH PAPER

Pathology

Prevalence and causes of thrombocytopenia in pregnant women from North-east India

KEY WORDS: Platelet count, Pregnancy, Gestational thrombocytopenia, HELLP syndrome

Dr Navanita Das Assistant Professor, Pathology Department, Gauhati Medical College, Guwahati.

Dr Sarat Das Associate Professor, Pathology Department, Jorhat Medical College,Jorhat.

ABSTRACT

Thrombocytopenia is the second most common hematological abnormality in pregnancy following anemia.
This prospective study, the first of its kind from this region, was conducted on 600 pregnant women for a period of one year to determine the prevalence and causes of thrombocytopenia and its consequences on both mother and child. These women were screened and investigated for aetiological diagnosis of thrombocytopenia. Fetomaternal outcome were also recorded.
Prevalence of thrombocytopenia was 8.3%, most common cause was gestational thrombocytopenia in 80%, followed by hypertensive disorders in 16%. Mode of delivery was not affected by thrombocytopenia. No maternal or neonatal bleeding complications were observed. The low platelet counts and declining trends with increasing gestational age predispose North-East Indian women to the risk of thrombocytopenia. Therefore a routine antenatal platelet count is suggested.

INTRODUCTION

Thrombocytopenia is defined as a platelet count of less than 150×10^9/L of blood[3,13]. It is second only to anaemia as the most common haematological abnormality in pregnancy affecting upto 10% of them[14].Thrombocytopenia results in bleeding into mucous membranes presenting as petechiae, ecchymosis,epistaxis and gingival bleeding. Bruising, haematuria, gastrointestinal bleed and intracranial haemorrhage can also occur.

Thrombocytopenia in pregnant women may result from either physiological or pathological processes.Causes for physiological decrease in platelet count is multifactorial and is related to hemodilution, increased platelet consumption and increased platelet aggregation.Pregnant women with thrombocytopenia tend to have fewer bleeding complications than nonpregnant women due to the procoagulant state induced by pregnancy.

Among the causes of thrombocytopenia in pregnancy,gestational thrombocytopenia (GT)is the most common cause accounting for 75% of all cases[9].It is defined by thrombocytopenia of $>70\times10^9$/L,especially during 3rd trimester[7] and returns to normal within 12 weeks of delivery[13].The etiology is unknown but is considered to be due to the relative hemodilution in pregnancy together with increased destruction of platelets in the placenta[13].GT does not carry risk of haemorrhage to the mother or infant.

Hypertensive disorders like preeclampsia and HELLP(hemolysis, elevated liver enzymes and low platelet count)syndrome are considered to be the cause of thrombocytopenia in about 21% of cases[4,11].The maternal platelet count returns to normal within 3-5 days of delivery[7].

Immune thrombocytopenic purpura (ITP) is caused by platelet destruction in the reticuloendothelial system,due to platelet auto-antibodies against several platelet membrane glycoprotein complexes.ITP is characterized by a moderate to severe decrease in the platelet count,and constitutes approximately 5% of cases[6,7].

Other less common causes are thrombotic thrombocytopenic purpura(TTP), hemolytic uremic syndrome (HUS),disseminated intravascular coagulation (DIC), systemic lupus erythematosus (SLE),anti-phospholipid antibody syndrome, or drug induced.

Classification of thrombocytopenia in pregnancy is arbitrary. Magann et al.divided thrombocytopenia according to severity into mild ($\geq$100-150$\times10^9$/L), moderate ($\geq$50-100$\times10^9$/L) and severe ($<50\times10^9$/L) thrombocytopenia[12].

The present study was aimed at determining the prevalence of thrombocytopenia among pregnant women in North-East India and at defining and estimating the proportion of the underlying causes so that it may provide a guide to the obstreticians for managing these patients.

MATERIALS AND METHODS

This prospective study was carried out from July 2015 to June 2016.A total of 600 pregnant women at different ages of gestation attending the Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, Guwahati were screened for the presence of thrombocytopenia.Pregnant women were interviewed and examined after obtaining their verbal consent. Antenatal women were enrolled in the study at first visit irrespective of gestational age.All women had platelet count estimation at the time of enrollment.

Exclusion criteria

Pregnant women who received blood within 10 days of the interview date.

Control group

Pregnant women with normal platelet counts.

The detailed work up of all cases of thrombocytopenia was done to ascertain the aetiology.

History of bleeding including family history,drug usage,viral infections, thrombocytopenia in previous pregnancies,transfusion history were taken.

General,systemic and obstetric examination was done to find any signs of thrombocytopenia(petechiae, ecchymosis, gum bleeding, hematuria, gastro intestinal bleed, intracranial bleed).

All women enrolled were subjected to routine laboratory tests including Complete blood count (CBC),Bleeding time,Clotting time,Liver function tests, Renal function tests, Hepatitis B surface antigen and HIV test. Tests for coagulation (Prothrombin time, Activated partial thromboplastin time,fibrin degradation products, fibrinogen estimation) were done in cases of preeclampsia, eclampsia and HELLP syndrome and in any pregnant woman presenting with bleeding manifestations unrelated to the severity of thrombocytopenia and in the absence of evident gynaecological causes.CBC was done using automated Haematology Analyser (Sysmex) and other tests were also done according to standard methods.

All the thrombocytopenic cases were followed up throughout the antenatal period till delivery to record any complications that developed due to low platelet counts. Platelet counts were repeated once in each trimester and in the postpartum period at 1,2 and 6 weeks. Babies of all cases were tested for thrombocytopenia and were followed up for any complications.

Standard statistical methods, ANOVA, student's t test were used to find the association between different causes and severity of thrombocytopenia.

RESULTS AND OBSERVATIONS

Out of the 600 antenatal women studied,age ranging from 18-45 years,50 (8.33%) had platelet counts less than 150×10^9/L.Of the latter,38(76%) had mild thrombocytopenia ($100\text{-}149\times10^9$/L and 12(24%) had moderate thrombocytopenia ($50\text{-}99\times10^9$/L) while none had severe thrombocytopenia ($<50\times10^9$/L).

Further, in 40 of the 50 thrombocytopenic women(80%),there was no identifiable causes for thrombocytopenia(i.e. it was gestational).In this category of patients, the platelet count ranged from $80 – 146 \times 10^9$/L with a mean platelet count of 128×10^9/L.35 cases (87.5%) had mild and 5 cases(12.5%) had moderate thrombocytopenia.

Among the remaining 10 out of the 50 thrombocytopenic women,the most common causes were preeclampsia(7cases, 14%), followed by eclampsia(1case, 2%), HELLP syndrome (1case, 2%) and ITP(1case, 2%). Their platelet count ranged from 50×10^9 to 126×10^9/L with an overall mean of 92×10^9/L which differed significantly from the mean count in the gestational group(p=0.001).It was noted that the proportion of gestational thrombocytopenia decreased with the severity of thrombo cytopenia(table 2). Out of 12 cases of moderate thrombocy topenia 5 were gestational thrombocytopenia.

Table 1:- Thrombocytopenia cases according to etiology

Serial no:	Cause	No: of Cases	%
1	Gestational	40	80
2	Pre-eclampsia	7	14
3	Eclampsia	1	2
4	HELLP	1	2
5	ITP	1	2

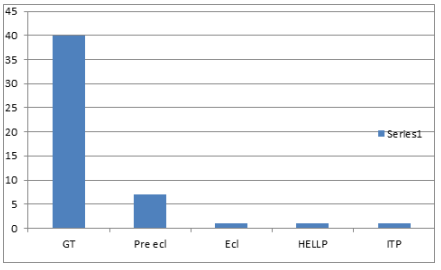

Fig1: Etiological classification of thrombocytopenia cases.

Table 2:-Prevalence of Maternal Thrombocytopenia according to platelet count

Characteristics	Maternal platelet count			
	Normal platelet count (150×10^9/L)	Mild thrombocytopenia ($100\text{-}149\times10^9$/L)	Moderate thrombocytopenia ($50\text{-}99\times10^9$/L)	Severe thrombocytopenia ($<50\times10^9$/L)
No: of pregnant women=600 No: of thrombocytopenic women=50	550	38 (76%)	12 (24%)	0
Gestational thrombocytopenia		35	5	0
Pre-eclampsia		3	4	0
Eclampsia		0	1	0
HELLP		0	1	0
ITP		0	1	0

There was no significant difference in the distribution of cases and controls according to age, religion and parity.The mean platelet count in control was 180×10^9/L and in cases was 100×10^9/L, showing a statistically significant difference between the two groups ($p<0.001$). Women with medical causes of thrombocytopenia had significantly lower($p<0.001$) mean platelet count as compared to other causes of thrombocytopenia.

A statistically significant decrease in platelet count($p<0.001$) was also seen among controls with increasing age of gestation. However no such change in mean platelet count was seen with increasing period of gestation among thrombocytopenic cases.

46 cases delivered during the study,68% delivered at term,32% delivered preterm,61.5% had normal vaginal delivery,36.5% had Caesarean section and 2% instrumental delivery. All the caesarean section were performed for obstetric/medical causes and none for thrombocytopenia.

In post-partum follow up, all those with thrombocytopenia of known etiology showed fast recovery,which was encountered within 48 hours for pregnancy related hypertension and 72 hours for HELLP syndrome.On the other hand,it was found that 28% of women with gestational thrombocytopenia remained thrombocytopenic at 2 weeks.No thrombocytopenia related complications reported in pregnant ladies.

Out of the 46 newborns,platelet count assessment could be done in 30 cases (65.2%). All had normal platelet counts at birth except the one born to mother with ITP.Neonatal thrombocytopenia of 65×10^9/L returned to normal on day eight.None of the babies had any bleeding complications.There was no significant difference in mean platelet count noticed between neonates born from thrombocytopenic pregnant women(269×10^9/L) and non thrombocytopenic mothers(273×10^9/L)($p=0.09$).

DISCUSSION

Thrombocytopenia is a common problem during pregnancy.In the present study, incidence of thrombocytopenia during pregnancy was 8.3%(50 out of 600). Burrows[3] found thrombocytopenia in 6%pregnant women.Thus the prevalence of thrombocytopenia in Indian population is similar to the world literature.

Majority (76%) had mild thrombocytopenia, only 24% had moderate thrombocytopenia and none had severe.These results are close to what have been reported by Boehlen et al[1] and Burrows & Kelton[4].

Karim et al[10] documented that severe thrombocytopenia is rare, occurs in less than 0.1% of pregnancies. In the present study, severe thrombocytopenia is nil.

The mean platelet count of controls showed a statistically significant fall ($p< 0.001$) with progression of gestation.Fay et al[8] found that the platelet count fall progressively as pregnancy progressed, this fall being statistically significant from 32 weeks gestation onward. Verdy at al[15] concluded that platelet counts fall by about 10% during an uncomplicated pregnancy,with the decline being greatest in the last trimester.

Gestational thrombocytopenia(80%) was the most common cause in this study with platelet count ranging from $80\text{-}146\times10^9$ /L.87.5% of GT cases had platelet counts $\geq100\times10^9$/L,that is,mild thrombocytopenia. It followed a benign course without any adverse effects and need for intervention during pregnancy.N Shehata et al[1] found that GT in pregnancy is characterized by mild thrombocytopenia.

Hypertensive disorders represented collectively 16% in accordance with previous figures reported by Boehlen et al[2]and Burrows & Kelton[3,4,5] showing nearly similar incidence of thrombocytopenia.

Thrombocytopenia due to HELLP syndrome occurred in only 2% of cases.

Incidence of ITP was relatively higher in the present study (2%).The

lone case of ITP was a previously diagnosed case but had not completed treatment.

In our study, no maternal/fetal complications due to thrombocytopenia were noted.

CONCLUSION

Gestational thrombocytopenia is the most common cause of thrombocytopenia during pregnancy (80%).A thorough history and physical examination is important to rule out most other causes.

Platelet count estimation should be a routine at 1st antenatal visit and also in subsequent visits to detect thrombocytopenia in pregnancy and to initiate appropriate management for favorable fetomaternal outcome.

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