Thrombocytopenia among Pregnant Women

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Background: Pregnant women with thrombocytopenia have a higher risk of bleeding during or after childbirth; the severity of thrombocytopenia can affect the obstetric outcome.

Objective: To evaluate the prevalence of thrombocytopenia among pregnant women and to evaluate the obstetric outcome.

Setting: Bahrain Defence Force Hospital, Bahrain.

Design: A Retrospective Study.

Method: Platelet count was analyzed in 4233 pregnant women who gave birth from 1 January 2016 to 31 December 2016. Two hundred eighty-seven pregnant women with thrombocytopenia were reviewed. Platelet level, maternal age, gestational age, parity, BMI, mode of delivery, pre-delivery coagulation profile, hemoglobin level, blood transfusion, postpartum hemorrhage (PPH) or preeclampsia were documented.

Result: Two hundred eighty-seven pregnant women with low platelet levels were included in the study. A positive relation between low platelet levels and gestational age and previous deliveries was found. A negative relation between low platelet and previous deliveries was found. No relation was found between platelet levels, Hb levels and coagulation profile. No difference was found in the mode of delivery or preeclampsia between the study groups.

PPH needing blood transfusion was found in women with platelet counts above 100×10^9/L; however, it did not reach statistical significance.

Conclusion: A low platelet rate in our population was found in 287 (6.8%) women. The majority of the women had platelet count above 100×10^9/L, 251 (87.45%) and gestational thrombocytopenia was the most common cause of thrombocytopenia, 275 (95.8%). Our study revealed lower gestational age and higher parity as risk factors for severe thrombocytopenia and the majority of the cases had good outcome.

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Thrombocytopenia is the second most common hematological abnormality during pregnancy after anemia[1,2]. It is encountered in 7%-10% of all pregnant women[3,4,5]. The normal range of platelets in non-pregnant women is 150,000-450,000/μL. Thrombocytopenia can be defined as a platelet count of less than 150,000/μL[6].

There are many potential causes of pregnancy-associated thrombocytopenia some of these are related to pregnancy. Others may occur in non-pregnant females, such as immune thrombocytopenia (ITP) or thrombotic thrombocytopenic purpura[7].

The pathophysiology of gestational thrombocytopenia is unknown. It is thought to be related to hemodilution, increased platelet consumption, and increased platelet aggregation because of increased levels of thromboxane A_2. It is a diagnosis of exclusion, occurring in the mid-second and third trimester[8]. Women are typically asymptomatic. Platelet count is typically greater than 70,000/μL and is resolved postnatally.

Pregnant women with low platelet counts are less symptomatic due to the procoagulant state induced by increased levels of fibrinogen, Factor VIII and von Willebrand Factor (VWF), suppressed fibrinolysis and reduced protein S activity[7].

Though thrombocytopenia diagnosed in pregnancy has a mild course in most cases, it has been reported to be associated with a higher rate of preterm birth, premature detachment of the placenta and the need for transfusion of blood products. Some cases of severe thrombocytopenia with systemic involvement are associated with high risk of serious perinatal morbidity, which needs careful clinical monitoring and treatment[5,9]. Pregnant women with thrombocytopenia have a higher risk of bleeding during childbirth. Furthermore, the severity of thrombocytopenia can affect the obstetric outcome, especially if a cesarean section or other surgical intervention is required during pregnancy, labor or in the puerperium.

PPH is defined as blood loss of 500 ml or more from the genital tract after vaginal delivery and 1000 ml after caesarean[10,11].

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Preeclampsia is diagnosed if a patient presents with new onset of hypertension after 20 weeks[12].

The aim of this study is to evaluate the prevalence of thrombocytopenia among pregnant women and to evaluate the obstetric outcome.

METHOD

Platelet count was analyzed in 4233 pregnant women who gave birth from 1 January 2016 to 31 December 2016. Two hundred eighty-seven women with thrombocytopenia were reviewed. All women who had a platelet count of less than 150×10^9/L at any given gestational age were included in the study. We analyzed patient characteristics such as maternal age, BMI, parity, gestational age, mode of delivery, pre-delivery coagulation profile, hemoglobin level, blood transfusion, PPH or preeclampsia.

Abnormal coagulation profile included all cases with prolonged PT (normal range from 12 to 16 seconds), or PTT (normal range from 28 to 45 seconds), reduce fibrinogen level (normal range from 2.00 to 4.00 g/l) or increased d-dimer level (more than 0.5 mg/l).

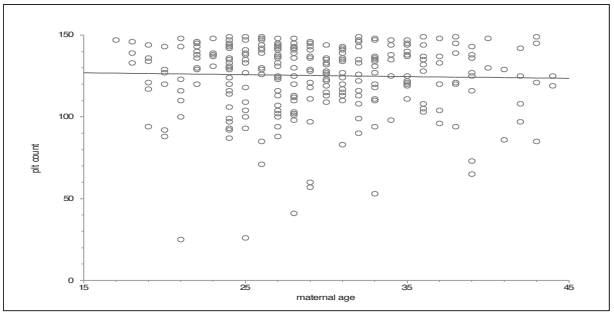
Our study groups were divided into mild cases with a platelet count of less than 150×10^9/L, moderate cases with a platelet count between 50-100×10^9/L and severe cases with platelet count less than 50×10^9/L.

Data were analyzed using StatsDirect statistical package (version: 3.0.141 Cheshire UK 2015). Two-sided simple linear regression analysis was used to assess the correlation of platelet level to maternal age, BMI, gestational age, parity and Hb level. Fisher-Freeman-Halton exact was used for assessing the percentage of women with abnormal coagulation profile, preeclampsia, mode of delivery, postpartum hemorrhage and blood transfusion. P-values of less than 0.05 were considered statistically significant.

RESULT

Two hundred eighty-seven women had a platelet count of less than 150×10^9/L. Three (1.04%) women had a platelet count of less than 50×10^9/L, 33 (11.49%) women had platelet counts between 50×10^9/L and 100×10^9/L, and 251 (87.45%) women had a platelet count of over 100×10^9/L.

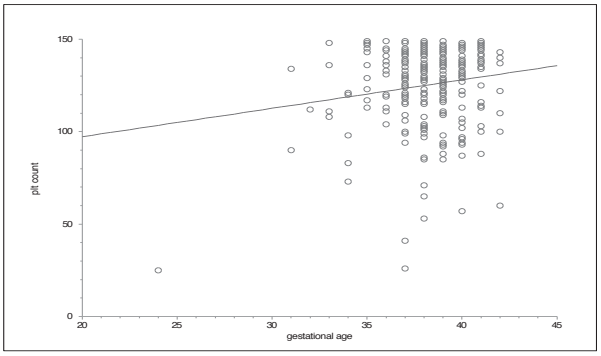
There was no correlation between platelet level and maternal age, P-value=0.5943, see figure 1.



Two sided simple linear regression P-value=0.5943

Figure 1: Correlation between Low Platelet and Maternal Age

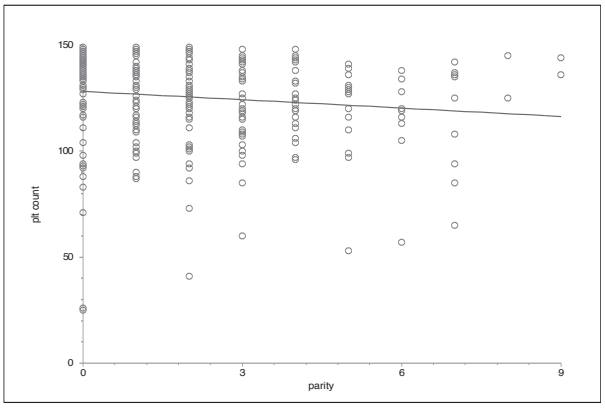
A positive correlation was found between low platelet count and gestation age; the higher the gestational age, the higher platelet count, P-value=0.0076, see figure 2.



Two sided simple linear regression P-value=0.0076

Figure 2: Correlation between Low Platelet and Gestational Age

A negative correlation was found between platelet levels and a number of previous delivery; the higher parity correlated negatively with platelet count, P-value=0.0364, figure 3.



Two-sided simple linear regression P-value=0.0364

Figure 3: Correlation between Low Platelet and Parity

No correlation was found between platelet levels and Hb level, P-value=0.1016, see figure 4.

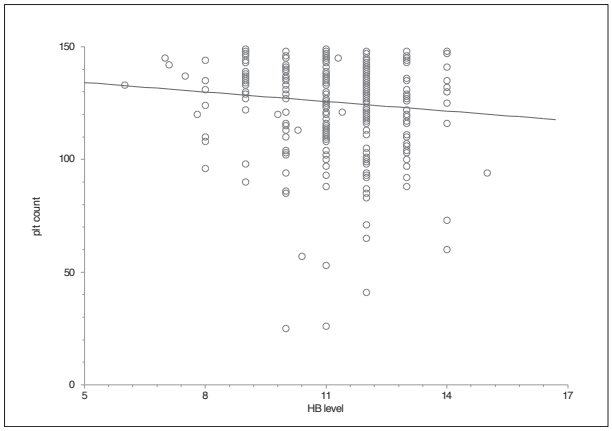
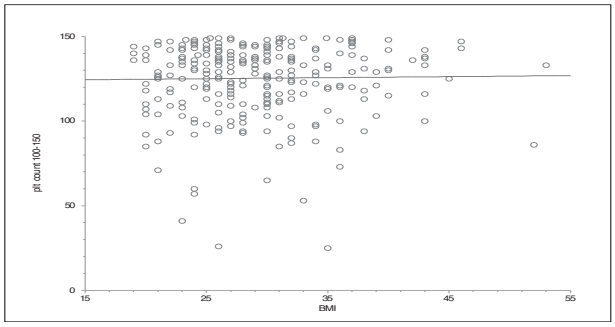


Figure 4: Correlation between Low Platelet and Hb Level

No correlation was found between platelet level and BMI, P-value=0.77, see figure 5.



Two=sided simple linear regression P-value=0.77

Figure 5: Correlation between Low Platelet and BMI Level

No significant difference was found in the percentage of abnormal coagulation profile in different platelet levels, P-value=0.06. There was no difference in mode of delivery, P-value= 0.25 or preeclampsia P-value=0.99. Most cases of PPH occurred in women with platelet counts above 100×109/L. However, it did not reach statistical significance. Consequently, blood transfusion was used mainly for those women, but it did not reach statistical significance, see table 1.

Table 1: Pregnancy Outcome in Study Groups

	Platelet level ≤ 50.000 N= 3	Platelet level >50.000-100.000 N=33	Platelet level > 100.000 N=251	P-value
Abnormal coagulation profile N (%)	0/3 (0%)	2/33 (6%)	1/251 (0.4%)	0.06*
Preeclampsia N (%)	0/3 (0%)	1/33 (3%)	8/251 (3.2%)	>0.99*
Mode of delivery N (%)	SVD 3/3 (100%) LSCS 0/3 (0%)	SVD24/33 (73%) LSCS 9/33 (27%)	SVD158/251(63%) LSCS 93/251(37%)	0.25*
Postpartum hemorrhage N (%)	0/3 (0%)	3/33 (9.1%)	9/251 (3.6%)	0.06*
Blood transfusion N (%)	0/3 (0%)	0/33 (0%)	13/251 (5.2%)	0.25*

*Fisher-Freeman-Halton Exact Test

DISCUSSION

Thrombocytopenia affects 6.8% of our antenatal women which is similar to what was reported in another study[13]. Nisha et al found a prevalence of thrombocytopenia of 8.8%[14,15]. Another study found a prevalence of 11.68%[16]. In a review, Myers et al found the prevalence to be 8%–10[17].

The majority of our women had mild thrombocytopenia with platelets level above 100×109/L (87.45%). Most common cases (95.8%) were gestational thrombocytopenia, preeclampsia (3.1%), and (1%) ITP.

In a study, gestational thrombocytopenia was found in 44.6% of cases, preeclampsia 22% and ITP 4.4%[9]. Similarly, in another study, the gestational factor was 49%, preeclampsia 17% and ITP 10.4%[9,18]. HELLP syndrome and preeclampsia were found to be associated with higher prevalence of thrombocytopenia[19]. Malaria and dengue are associated with thrombocytopenia[16]. Katke et al found that 30% of thrombocytopenia were gestationally induced, followed by malaria, dengue and other diseases.

In our study, most thrombocytopenia cases were found in the third trimester; a similar finding was found by other studies[18,19,21]. In studies with infection-related thrombocytopenia, the correlation to higher gestational age is lost. Pandey et al found only 20% of their cases between 35-39 gestational weeks compared to 41% at 30-34 weeks[16].

Most cases in our study were mild. Begam et al found more moderate and severe cases in their study[18]. Infection-related thrombocytopenia usually presents with more moderate to severe form[16].

In our study, a negative correlation was found between parity and low platelet count; the higher the parity the lower the platelet count. This correlation was not found in other studies[14,18] .

In our study, no significant correlation was found between low platelet and maternal age; a similar finding was found in a case-control study[14]. Parnas et al found that women with moderate to severe thrombocytopenia were significantly older than women without thrombocytopenia[21,22].

No correlation between platelet level and HB level was found; however, it has been reported previously that 37% of women with thrombocytopenia had anemia[22].

In our study, PPH was more common in the milder group; the majority of our women had mild gestational disease, but this increase was not statistically significant. Similar findings were reported in other studies. However, it was reported that higher rate of anemia requiring blood transfusion was found in moderate to severe thrombocytopenia compared with the control group[21]. Dwivedi et al reported an increased risk of bleeding and PPH[23].

Our study is limited by being retrospective and not having a control group. Our analysis was limited to women who attended labor room; a wider inclusion criteria will yield more information. Further prospective study is required to evaluate thrombocytopenia in pregnancy.

CONCLUSION

Thrombocytopenia rate in our study was 6.8%. The majority of the women had platelet counts above 100×109c/L and gestational thrombocytopenia was the most common cause of thrombocytopenia. Our study revealed lower gestational age and higher parity as risk factors for severe thrombocytopenia. The majority of the cases had a positive outcome.

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REFERENCES

1. Sainio S, Kekomaki R, Riikonen S, et al. Maternal thrombocytopenia at Term: A Population-Based Study. Acta Obstet Gynecol Scand 2000; 79(9):744-749.
2. Burrows RF, Kelton JG. Incidentally Detected Thrombocytopenia in Healthy Mothers and Their Infants. N Engl J Med 1988; 319(3):142-145.
3. Rajasekhar A, Gernsheimer T, Stasi R, et al. Clinical Practice Guide on Thrombocytopenia in Pregnancy; Quick Reference. Washington, DC: American Society of Hematology, 2013.
4. Onyangunga OA, Moodley J. Managing Pregnancy with HIV, HELLP Syndrome and Low Platelets. Best Pract Res Clin Obstet Gynaecol 2012; 26: 133-147.
5. Jodkowska A, Martynowicz H, Kaczmarek-Wdowiak B et al. Thrombocytopenia in Pregnancy – Pathogenesis and Diagnostic Approach. Postepy Hig Med Dosw 2015; 69: 1215-1221.
6. Fay RA, Hughes AO, Farron NT. Platelets in Pregnancy: Hyperdestruction in Pregnancy. Obstet Gynecol 1983; 61(2):238-40.
7. McCrae KR. Thrombocytopenia in Pregnancy. In: Michelson AD, ed. Platelets. New York, NY: Elsevier, 2006; 925–933.
8. Bockenstedt PL. Thrombocytopenia in Pregnancy. Hematol Oncol Clin North Am 2011; 25: 293-310.
9. Vyas R, Shah S, Yadav P, et al. Comparative Study of Mild versus Moderate to Severe Thrombocytopenia in Third Trimester of Pregnancy in a Tertiary Care Hospital. NHL Journal of Medical Sciences 2014; 3(1).
10. RCOG 2016. RCOG Green-top Guideline No 52: Prevention and Management of Postpartum Haemorrhage. https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg52/ Accessed in August 2016.
11. The Prevention and Treatment of Postpartum Haemorrhage: What Do We Know, and Where Do We Go To Next? BJOG 2015; 122 (2): 202–10.
12. RCOG 2011. RCOG Green Top Guideline No 10A : Severe Preeclampsia/Eclampsia, Management. https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg10a/ Accessed in August 2016.
13. Shamoon RP, Muhammed NS, Jaff MS. Prevalence and Etiological Classification of Thrombocytopenia among a Group of Pregnant Women in Erbil City, Iraq. Turk J Hematol 2009; 26(23):123–128.
14. Nisha S, Amita D, Uma S. Prevalence and Characterization of Thrombocytopenia in Pregnancy in Indian Women. Indian J of Hematology and Blood Transfusion 2012; 28(2):77-81.
15. Asrie F, Enawgaw B, Getaneh Z. Prevalence of Thrombocytopenia among Pregnant Women Attending Antenatal Care Service at Gondar University Teaching Hospital, Northwest Ethiopia. Journal of Blood Medicine 2017; 8: 61–66.
16. Pandey A, Singh R. Thrombocytopenia during Pregnancy: An Institutional Based Prospective Study of One Year. International Journal of Research in Medical Sciences. Int J Res Med Sci 2017; 5(8):3502-3505.
17. Myers B. Thrombocytopenia in Pregnancy. Obstert Gynecol 2009; 11(3):177–183.
18. Begam A, Sujatha TL, Nambisan B, et al. Risk Factors of Thrombocytopenia in Pregnancy. Int J Reprod Contracept Obstet Gynecol 2017; 6(2):700-706.
19. Mamatha S. Thrombocytopenia during Pregnancy. Journal of Evolution of Medical and Dental Science 2010; 3(57):12956-60.
20. Katke RD, Gohil DV. Thrombocytopenia during pregnancy: an institutional based study. Int J Reprod Contracept Obstet Gynecol 2014; 3(4):947-951.
21. Parnas M, Sheiner E, Shoham-Vardi I, et al. Moderate to Severe Thrombocytopenia during Pregnancy. Eur J Obstet Gynecol Reprod Biol 2006; 128(1-2):163-8.
22. Altayri S. Prevalence of Thrombocytopenia Among Pregnant Womenin Tripoli Region, Libya. Cardiology and Cardiovascular Research 2017; 1(1): 23-28.
23. Dwivedi P, Puri M, Nigam A, et al. Fetomaternal Outcome in Pregnancy with Severe Thrombocytopenia. Eur Rev Med Pharmacol Sci 2012; 16(11):1563–1566.