

## Assessment of the Platelet Count in the Pregnant Women

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### Abstract

**Aim:** The present study was conducted to assess the Platelet Count in the Pregnant Women.

**Methods:** The present study was planned in Department of Pathology, Darbhanga medical college and Hospital, Darbhanga, Bihar, India for a period of 8 months. In the present study 100 pregnant females' samples received for the platelet estimation were enrolled in the present study.

**Results:** The commonest age groups in which thrombocytopenia seen were between 21 to 25 years. The result showed that age was an important criterion and there was difference in the occurrence of thrombocytopenia in different age groups.

**Conclusion:** Clinically platelet indices can be a useful screening test for early identification of preeclampsia and eclampsia. Platelet count is a simple, low cost, and rapid routine screening test.

**Keywords:** Platelet Count, Pregnant Women, Mean Platelet Volume

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### Introduction

Mild thrombocytopenia in pregnant women at the time of delivery, described as gestational thrombocytopenia, has been well documented in three large studies during that past 24 years. [1-3] The reduced, but symmetrical, distribution of platelet counts at delivery suggests that a shift from normal values to lower platelet counts occurs in all women. [2-5] These observations have led to the common belief that a physiologic change associated with pregnancy causes platelet counts to gradually decrease.

Platelets are responsible for blood clotting and play a significant role during pregnancy as well. The average or normal

platelet count of a non-pregnant woman may range between 150,000 and 400,000 per microlitre of blood. The platelet count of a woman may drop to 116,000 per microlitre of blood during pregnancy. However, if it is less than 116,000, the condition is known as thrombocytopenia. Thrombocytopenia, or a low blood platelet count, is encountered in 7-12% of all pregnancies. [6] Women are more commonly diagnosed with platelet disorders during pregnancy since screening is done as part of the initial clinic evaluation with automated blood counts. Thrombocytopenia can result from a wide range of conditions with several of them being pregnancy related. [7] Platelets

are non-nucleated cells derived from megakaryocytes in the bone marrow and normally live in the peripheral circulation for as long as 10 days. Platelets play a critical initiating role in the hemostatic system.

Preeclampsia occurs in 3 to 4% of pregnancies and accounts for 5 to 21% of cases of maternal thrombocytopenia. Thrombocytopenia is usually moderate and platelet count rarely decreases to < 20,000/ $\mu$ L. Thrombocytopenia in patients with preeclampsia always correlates with the severity of the disease. A platelet count of <100,000/uL is diagnostic for preeclampsia. It is considered a sign of worsening disease and is an indication for delivery.

Normal pregnancy is characterized by physiological fall in platelet count. Platelet count decreases by an average of 10% during pregnancy. [8] Physiological fall in the platelet count occurs as a result of hemodilution and because of rise in physiological strain on endothelium resulting in platelet aggregation in blood vessels and thus decrease in number of platelets in circulation. [9] Thrombocytopenia is defined as the subnormal number of platelets in the circulating blood, usually less than 1,50,000/cu mm. [10] It is classified as mild with platelet count 100-150 x 10<sup>9</sup> /l, moderate at 50-100 x 10<sup>9</sup> /l, and severe with less than 50 x 10<sup>9</sup> /l. [11] Thrombocytopenia complicates up to 10% of all pregnancies [12] and is second most common haematological abnormality during pregnancy following anemia. Gestational thrombocytopenia is considered as the most common cause of thrombocytopenia in pregnancy and about 75% cases of pregnancy associated thrombocytopenia are due to gestational thrombocytopenia. [10] The etiology is unknown, but is thought to be physiological. It is considered as mild form thrombocytopenia with no risk to the mother or infant. [13] The present study

was conducted to assess the Platelet Count in the Pregnant Women.

### Methods

The present study was planned in Department of Pathology, Darbhanga medical college and Hospital, Darbhanga, Bihar, India for a period of 8 months. In the present study 100 pregnant females' samples received for the platelet estimation were enrolled in the present study.

Following was the inclusion and exclusion criteria for the present study.

**Inclusion Criteria:** The records of pregnant women with proved platelet abnormalities Normal pregnancy at 2nd-3rd trimester.

**Exclusion criteria:** All cases with pre-existing hypertension other than PIH. Patients having co morbid conditions such as Severe anaemia, Diabetes mellitus, History of auto immune disorder, History of Idiopathic Thrombocytopenic Purpura, History of receiving drugs like aspirin, anti-coagulants etc.

### Methodology

Relevant data were obtained from case files and compiled by a common proforma that included socio-demographic characteristics of mothers, obstetric history, signs and symptoms in mother at presentation, laboratory data, and maternal and perinatal outcomes. The data collection was followed by analysis of the collected data.

Clinical details of all cases were documented. Those cases with pre-existing hypertension, having associated co morbid diseases such as diabetes mellitus, auto immune disorders, ITP, neoplastic diseases, heart diseases and cases on anticoagulants were excluded from the study.

All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of

the institutional ethical committee was taken prior to conduct of this study.

## Results

**Table 1: Age groups and number of cases in two groups**

Age	Cases: with thrombocytopenia	Control: without thrombocytopenia	Total
<20 years	15	14	29
21-25 years	20	22	42
26-30 years	10	10	20
>31 years	5	4	9
Total	50	50	100

The commonest age group in which thrombocytopenia seen was between 21 to 25 years. Table 1 showed that age was an important criterion and there was difference in the occurrence of thrombocytopenia in different age groups.

**Table 2: Mean platelet count in cases and controls**

Conditions	Platelet Count ( x 10 <sup>9</sup> /L)
Cases	26-370
Mild Pre-eclampsia	66-375
Severe Pre-eclampsia	27-259
Controls	28-32

## Discussion

Platelet is formed primarily in the bone marrow. They are released into the blood stream where they normally live for about a week. Platelet serves to clotting coagulation and maintaining vascular integrity. Platelet are small un-nucleated corpuscles derived from bone marrow megakaryocytic in both the pregnant and non-pregnant states, mature platelets circulate for 8-9 days platelets act to repair defects in the vascular endothelium and reduce hemorrhage by promoting blood clot formation when activated, typically by vessel wall trauma. Platelets become adherent to themselves and all surfaces including glass. Hence the need to collect blood for platelet counts in bottles containing anticoagulant such as sodium, heparin or citrate. Endothelial damage promotes platelet aggregation and degranulation which in turn stimulates the release of prostaglandin and thromboxane A<sub>2</sub>, amplifying the platelet clumping and vasoconstriction.

Pregnancy is associated with complex changes involving blood coagulation, a transient mild thrombocytopenia is seen due to increased platelet consumption. [12] Hypertension is one of the most common obstetric problems resulting in preeclampsia and eclampsia which in turn associated with thrombocytopenia. [5] The obstetrician nowadays rely increasingly on laboratory test for the management of pregnant women. [14] The most common cause of thrombocytopenia in pregnancy is preeclampsia and eclampsia and also found associated with increased risk of perinatal complications such as abruptio placenta, preterm delivery, low Apgar score and still birth. [15-17] The estimation of platelet indices is a reliable method. [18]

Preeclampsia is one of the commonest medical disorders during pregnancy and affects approximately 5–10% of all pregnancies mostly affecting the primigravida. It continues to be major causes of maternal and perinatal morbidity and mortality. [19]

Mohammed et al. [20] have studied the variations of platelet indices in PIH in a fixed study group of 20 cases each under each category, whereby the incidence of each cannot be commented upon and Parmar et al. [21] have categorized PIH cases into mild, moderate and severe PIH. Wolde et al.'s [22] method to categorize cases with PIH based on the National High BP Education Working Group (2000) criteria has been done in this study owing to feasibility and simplicity of categorization into the five mentioned groups.

In our study, most cases belonged to the mild preeclampsia (60%) group followed by cases with severe preeclampsia (35%). The incidence of eclampsia however was much lower in our study (5%). These differences could be due to small sample size of our study and the social ethnic and cultural difference in group of population studied as noted by Wolde et al. [22] who has quoted black race as one of the risk factors for PIH. Gestational Thrombocytopenia is the most commonly observed 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 pseudo thrombocytopenia. [23] 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.

Decrease in platelet count is proportional to severity of disease. Assessment of platelet count is a simple, cost effective & sensitive method to know the prognosis & fetomaternal outcome in preeclampsia & eclampsia.

## Conclusion

Clinically platelet indices can be a useful screening test for early identification of preeclampsia and eclampsia. Platelet count is a simple, low cost, and rapid routine screening test. Hence the data generated from the present study concludes that platelet count can be used as a simple and cost effective tool to monitor the progression of preeclampsia, thereby preventing complications to develop during the gestational period.

## References

1. Burrows RF, Kelton JG. Fetal thrombocytopenia and its relation to maternal thrombocytopenia. *New England Journal of Medicine*. 1993 Nov 11;329(20):1463-6.
2. Boehlen F, Hohlfeld P, Extermann P, Perneger TV, De Moerloose P. Platelet count at term pregnancy: a reappraisal of the threshold. *Obstetrics & Gynecology*. 2000 Jan 1;95(1):29-33.
3. Salnlo S, Kekomäki R, Rllkonen S, Teramo K. Maternal thrombocytopenia at term: a population-based study. *Acta obstetrica et gynecologica Scandinavica*. 2000 Jan 1;79(9):744-9.
4. Burrows RF, Kelton JG. Incidentally detected thrombocytopenia in healthy mothers and their infants. *New England Journal of Medicine*. 1988 Jul 21;319(3):142-5.
5. Burrows RF, Kelton JG. Platelets and pregnancy. *Current Obstetric Medicine*. 1993; 2:83-106.
6. Practice Bulletin No. 166: Thrombocytopenia in Pregnancy. *Obstet Gynecol*. 2016 Sep. 128 (3): e43-53.
7. Kadir RA, McLintock C. Thrombocytopenia and disorders of platelet function in pregnancy. *Semin Thromb Hemost*. 2011 Sep. 37(6):640-52.
8. Van Buul EJ, Steegers EA, Jongsma HW, Eskes TK, Thomas CM, Hein PR. Haematological and biochemical profile of uncomplicated pregnancy in

- nulliparous women; a longitudinal study. *Neth J Med.* 1995; 46(2): 73–85
9. Piazzè J, Stefano G, Spagnuolo A, Cerekja A. Platelets in pregnancy. *Journal of Prenatal Medicine.* 2011; 5 (4): 90- 92.
  10. Jeffery A, Levy, Lance D, Murphy. Thrombocytopenia in pregnancy; *J Am Board FamPract.* 2002; 15(4); 290-97.
  11. Kam PC, Thompson SA, Liew AC. Thrombocytopenia in the parturient. *Anaesthesia.* 2004 Mar;59(3):255-64.
  12. McCrae KR. Thrombocytopenia in pregnancy: differential diagnosis, pathogenesis, and management. *Blood reviews.* 2003 Mar 1;17(1):7-14.
  13. Missfelder-Lobos H, Teran E, Lees C, Albaiges G, Nicolaides KH. Platelet changes and subsequent development of pre-eclampsia and fetal growth restriction in women with abnormal uterine artery Doppler screening. *Ultrasound in Obstetrics and Gynecology: The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology.* 2002 May 1;19(5):443-8.
  14. Annam V, Srinivasa K, Santosh KY, Suresh DR. Evaluation of platelet indices and platelet counts and their significance in preeclampsia and eclampsia. *Int J Bio Med Re.;* 2011; 2 (1):425-28.
  15. Parnas M, Sheiner E, Shoham-Vardi I, Burstein E, Yermiahu T, Levi I, Holcberg G, Yerushalmi R. Moderate to severe thrombocytopenia during pregnancy. *European Journal of Obstetrics & Gynecology and reproductive biology.* 2006 Sep 1;128 (1-2):163-8.
  16. Järemo P, Lindahl TL, Lennmarken C, Forsgren H. The use of platelet density and volume measurements to estimate the severity of pre-eclampsia. *European journal of clinical investingation.* 2000 Dec 30;30(12):111 3-8.
  17. Sultana R, Fazlul Karim S M, Atia Farhana, Ferdousi Shahnila, Selina Ahmed. Platelet Count in Preeclampsia. *J. Dhaka National Med. Coll. Hos.* 2012; 18 (02): 24-26.
  18. Mohapatra S, Pradhan BB, Satpathy UK, Mohanty A, Pattnaik JR. Platelet estimation: its prognostic value in pregnancy induced hypertension. *Indian J Physiol Pharmacol.* 2007;51 (12):160-164.
  19. Roberts JM, Cooper DW. Pathogenesis and genetics of pre-eclampsia. *The Lancet.* 2001 Jan 6;357(9249):53-6.
  20. Mohammed FE, Khalil HB, Idriss MI, Mohamadein Abdalla TE, Elnoman Elbadawi NE. Variations of platelets indices in pregnancy induced hypertension. *J Physiobiochem Metab* 2: 1.
  21. Parmar MT, Solanki HM, Gosalia VV. Study of risk factors of perinatal death in pregnancy induced hypertension (PIH). *National Journal of Community Medicine.* 2012 Dec 31;3(04):703-7.
  22. Wolde Z, Segni H, Woldie M. Hypertensive disorders of pregnancy in Jimma University specialized hospital. *Ethiopian journal of health sciences.* 2011;21(3).
  23. Roy D. S., Alqifari D. S. F., & Walia C. Cyclopedic analysis of medication-related osteonecrosis of the jaws in patients with diabetes mellitus. *Journal of Medical Research and Health Sciences,* 2022; 5(8): 2153–2164.