Blood Platelets Reference Range in Pregnancy

1. Platelet Counts during Pregnancy.

Author(s): Reese, Jessica A; Peck, Jennifer D; Deschamps, David R; McIntosh, Jennifer J; Knudtson, Eric J; Terrell, Deirdra R; Vesely, Sara K; George, James N

Source: The New England journal of medicine; Jul 2018; vol. 379 (no. 1); p. 32-43

Publication Date: Jul 2018
Publication Type(s): Research Support, N.i.h., Extramural Journal Article

Abstract:
BACKGROUND: Platelet counts of less than 150,000 per cubic millimeter during uncomplicated pregnancies are described as gestational thrombocytopenia if no alternative cause is identified. Platelet counts may be even lower in women with pregnancy-related complications. However, the occurrence and severity of thrombocytopenia throughout pregnancy are not defined.

METHODS: We evaluated platelet counts throughout pregnancy in women who delivered at Oklahoma University Medical Center between 2011 and 2014. These platelet counts were compared with those of nonpregnant women who were included in the National Health and Nutrition Examination Survey from 1999 through 2012.

RESULTS: Among the 15,723 deliveries that occurred during the study period, 7351 women had sufficient data for our analyses. Of these women, 4568 had uncomplicated pregnancies, 2586 had pregnancy-related complications, and 197 had preexisting disorders associated with thrombocytopenia. Among the women who had uncomplicated pregnancies, the mean platelet count in the first trimester (mean gestation, 8.7 weeks) was 251,000 per cubic millimeter, which was lower than the mean platelet count in the 8885 nonpregnant women (273,000 per cubic millimeter) (P<0.001). At the time of delivery, 9.9% of the women with uncomplicated pregnancies had a platelet count below 150,000 per cubic millimeter. During the course of the uncomplicated pregnancies and deliveries, only 45 women (1.0%) had a platelet count below 100,000 per cubic millimeter. Among the women with uncomplicated pregnancies, the mean platelet count in the first trimester (mean gestation, 8.7 weeks) was 251,000 per cubic millimeter, which was lower than the mean platelet count in the 8885 nonpregnant women (273,000 per cubic millimeter) (P<0.001). At the time of delivery, 9.9% of the women with uncomplicated pregnancies had a platelet count below 150,000 per cubic millimeter. During the course of the uncomplicated pregnancies and deliveries, only 45 women (1.0%) had a platelet count below 100,000 per cubic millimeter. Among the 12 women with uncomplicated pregnancies who had a platelet count below 80,000 per cubic millimeter, only 5 (0.1%, among whom the range of platelet counts was 62,000 to 78,000 per cubic millimeter; median, 65,000) were identified by medical record review as having no alternative cause for the thrombocytopenia. Platelet counts of less than 150,000 per cubic millimeter at the time of delivery were more common among women who had pregnancy-related complications than among women who had uncomplicated pregnancies (11.9% vs. 9.9%, P=0.01). Throughout their pregnancies and deliveries, 59 women (2.3%) with pregnancy-related complications had a platelet count below 100,000 per cubic millimeter, and 31 (1.2%) had a platelet count below 80,000 per cubic millimeter.

CONCLUSIONS: Mean platelet counts...
decreased during pregnancy in all the women, beginning in the first trimester. In women who have a platelet count of less than 100,000 per cubic millimeter, a cause other than pregnancy or its complications should be considered. (Funded by the National Heart, Lung, and Blood Institute.).

Database: Medline

1. Meta-analysis of reference values of haemostatic markers during pregnancy and childbirth

Author(s): Tang J.; Huang R.; Chen Q.; Lin Y.; Mai H.; Luo Y.; Xiao D.
Source: Taiwanese Journal of Obstetrics and Gynecology; Jan 2019; vol. 58 (no. 1); p. 29-35
Publication Date: Jan 2019
Publication Type(s): Review
PubMedID: 30638475
Available at Taiwanese Journal of Obstetrics and Gynecology from Free Medical Journals . com

Abstract: Previously reported haemostatic reference intervals in normal pregnancy displayed considerable contradictions to establish convince gestational age-related haemostatic reference values. 30 clinical reports were recruited to collect and assemble existing clinical reports from the database D-dimer levels increased progressively with gestational ages and exceeded conventional value of 1 mg/L after 29-36 weeks, and reached a peak at 24 h postpartum with mean value of 6.44 mg/L [95% confidence interval (CI): 5.84 to 7.05] and returned to 0.79 mg/L (95% CI: 0.43 to 1.16) at 1-8 weeks postpartum. Analogously, the level of fibrinogen gradually increased throughout the pregnancy, and peaked at 48-72 h after birth, with mean value of 9.05 g/L (95% CI: 2.22 to 15.89) and then returned to 3.62 g/L (95% CI: 3.03 to 4.20) at 1-8 weeks postpartum. However, in the middle trimester, asynchronously prothrombin fragments 1 + 2 (F1+2) level elevated and reached a peak at 28-36 weeks with mean value of 3.05 nmol/L (95% CI: 2.41 to 3.70), and then decreased in the later trimester, and reached 1.92 nmol/L (95% CI: 0.58 to 3.27) at 48-72 h post-partum, close to normal levels. Previously reported gestational age-related haemostatic reference intervals in pregnancy could not be used as a standard. Copyright © 2018

Database: EMBASE

3. Neutrophils to lymphocytes ratio and platelets to lymphocytes ratio in pregnancy: A population study

Author(s): Klement A.H.; Hadi E.; Asali A.; Shavit T.; Wiser A.; Haikin E.; Barkan Y.; Biron-Shental T.; Zer A.; Gadot Y.
Source: PLoS ONE; May 2018; vol. 13 (no. 5)
Publication Date: May 2018
Publication Type(s): Article
PubMedID: 29787560
Available at PLoS ONE - from Europe PubMed Central - Open Access

Abstract: Background Neutrophils to lymphocytes ratio (NLR) and platelets to lymphocytes ratio (PLR) are both inflammatory ratios that can be easily calculated from a simple blood count. They are frequently reported and tested as prognostic factors in several medical disciplines. Pregnancy involves special reference values for laboratory assays. Objective The aim of this study was to define pregnancy-related reference values for NLR and PLR according to trimester, background morbidity and according to the patient’s age. Study design A retrospective analysis of a large cohort undergoing community-based pregnancy surveillance between the years 2011-2016. Data were
analyzed according to high-risk patient versus normal-risk patient. Results A total of 11,415 patients were included. Mean PLR and NLR values were 136.3+/−44.3, 2.6+/−1, respectively during the first trimester, 144.6+/−47.1, 4.0+/−1.4 respectively during the second trimester and 118.1+/−42.0, 3.5+/−1.2 respectively during the third trimester. No difference was detected between the high-risk and the normal population (P-values 0.3, 0.5 and 0.4 for PLR in each trimester respectively and 0.3, 0.4, 0.6 for NLR in each trimester, respectively). No differences were detected among parity categories. The correlation between patient’s age and either PLR and NLR was a weak positive correlation (though statistically significant). Both PLR and NLR reached a maximum value during the second trimester. The differences between mean NLR and PLR between trimesters were significant (P < 0.01 for all differences tested). PLR rises in the presence of anemia, reaching statistical significance (P-value for PLR in each trimester was <0.01). NLR showed an opposite trend (P-values for NLR were 0.4, 0.005 and 0.06 in each trimester, respectively). Conclusions In our cohort, there were generally no differences between the high-risk and the normal population, excluding patients with a fibroid uterus or inflammatory bowel disease who presented a significantly elevated PLR through all trimesters. Both PLR and NLR reached a maximum value during the second trimester and were positively correlated with age. We anticipate that the population-based data will assist in providing accurate reference values for future research testing NLR and PLR measures during pregnancy.

4. Reference intervals for biochemical, haemostatic and haematological parameters in healthy Chinese women during early and late pregnancy

Author(s): Jin Y.; Lu J.; Jin H.; Fei C.; Xie X.; Zhang J.
Source: Clinical Chemistry and Laboratory Medicine; May 2018; vol. 56 (no. 6); p. 973-979
Publication Date: May 2018
Publication Type(s): Article
Abstract: Variations in maternal blood parameters, which are mostly induced by the physiological changes that occur during pregnancy, have been reported in different gestational periods. The use of the established reference intervals for healthy adult females leads to the misclassification of healthy pregnant women as abnormal. Our aim was to establish appropriate reference intervals for biochemical, haematological and haemostatic parameters in the first and third trimesters of pregnancy. We included 565 healthy pregnant women with normal pregnancies. Blood samples were collected for biochemical analyses, complete blood counts and coagulation analyses at 8-12 and 28-37 weeks of gestation. The median and reference intervals (the 2.5th and 97.5th values) were calculated for each parameter during pregnancy and then compared to the established reference intervals for healthy adult females. Significant increases in triglyceride, total cholesterol, low-density lipoprotein cholesterol, uric acid, alkaline phosphatase, white blood cell, mean platelet volume, fibrinogen and D-dimer reference intervals and clear decreases in total protein, albumin, blood urea nitrogen, creatinine, red blood cell, haemoglobin, haematocrit, platelet counts and thrombin time reference intervals were observed during pregnancy. According to the 'n%', most changes were observed beginning in the first trimester. Compared to the established reference intervals, the greatest misclassifications were observed for ALB, ALP and D-Di. Changes in maternal blood parameters during pregnancy were confirmed. We recommend that the reference intervals for most blood parameters be revised to account for the gestational period.

Database: EMBASE
5. Platelet parameters in healthy and pathological pregnancy.

Author(s): Maconi, Mariacaterina; Cardaropoli, Simona; Cenci, A M

Source: Journal of clinical laboratory analysis; Jan 2012; vol. 26 (no. 1); p. 41-44

Abstract: Changes in platelet count (PLT) are very important during pregnancy. Many platelet disorders occur during pregnancy and a reduction in PLT is the most common hemostasis abnormality identified, and this has important implications for mother and foetus. Many of these disorders share clinical and laboratory features, making accurate diagnosis difficult. The aim of this study was to establish reference intervals of platelet parameters for some of the more important pathologies associated to pregnancy (pre-eclampsia, gestational diabetes, autoimmune disorders, viral infections) using the automated hematology analyzer Sysmex XE-2100 and to evaluate the difference between healthy and pathological pregnancy. We enrolled in our study 100 pregnant women in the third trimester of pregnancy. The parameters analyzed included PLT, platelet distribution width, and mean platelet volume (MPV). We found statistically significant difference in PLT in pre-eclampsia, autoimmune disorders, and viral infections. Our results demonstrated also a statistically significant difference in MPV in pre-eclampsia and gestational diabetes. Our results allow the clinicians to detect hematologic change by simple complete blood count useful for the management of the pathological pregnancies. In conclusion, the overall picture of platelet disorders is extremely variegated, leading to numerous diagnostic and therapeutic problems whose solutions require close collaboration between clinicians and laboratory specialists.

Database: Medline

6. Platelets in pregnancy.

Author(s): Juan, Piazze; Stefano, Gioia; Antonella, Spagnuolo; Albana, Cerekja

Source: Journal of prenatal medicine; Oct 2011; vol. 5 (no. 4); p. 90-92

Abstract: As stated in this review, platelets functions and their important role in coagulability in pregnancy must be well understood, not only in thrombosis related complications in pregnancy (i.e., hypertension, diabetes, thrombophilia). Clinical findings suggest that a periodical monitoring of haematological markers such as MPV and coagulation markers may be associated to Doppler velocimetry, keeping in mind also that the incidence of complications is increased in women who have heritable platelet function disorders.

Database: Medline
Haemostatic reference intervals in pregnancy

Author(s): Szecsi P.B.; Andersen M.R.; Stender S.; Jorgensen M.; Klajnbard A.; Colov N.P.

Source: Thrombosis and Haemostasis; Apr 2010; vol. 103 (no. 4); p. 718-727

Abstract: Haemostatic reference intervals are generally based on samples from non-pregnant women. Thus, they may not be relevant to pregnant women, a problem that may hinder accurate diagnosis and treatment of haemostatic disorders during pregnancy. In this study, we establish gestational age-specific reference intervals for coagulation tests during normal pregnancy. Eight hundred one women with expected normal pregnancies were included in the study. Of these women, 391 had no complications during pregnancy, vaginal delivery, or postpartum period. Plasma samples were obtained at gestational weeks 13-20, 21-28, 29-34, 35-42, at active labor, and on postpartum days 1 and 2. Reference intervals for each gestational period using only the uncomplicated pregnancies were calculated in all 391 women for activated partial thromboplastin time (aPTT), fibrinogen, fibrin D-dimer, antithrombin, free protein S, and protein C and in a subgroup of 186 women in addition for prothrombin time (PT), Owren and Quick PT, protein S activity, and total protein S and coagulation factors II, V, VII, VIII, IX, X, XI, and XII. The level of coagulation factors II, V, X, XI, and antithrombin, protein C, aPTT, PT remained largely unchanged during pregnancy, delivery, and postpartum and were within non-pregnant reference intervals. However, levels of fibrinogen, D-dimer, and coagulation factors VII, VIII, and IX increased markedly. Protein S activity decreased substantially, while free protein S decreased slightly and total protein S was stable. Gestational age-specific reference values are essential for the accurate interpretation of a subset of haematologic tests during pregnancy, delivery, and puerperium. © Schattauer 2010.
those cases, the minimum to maximum range was used and combined with the 2.5 and 97.5 percentile range. We found that there is a substantial difference in normal values in some laboratory markers in the pregnant state when compared with the nonpregnant state. CONCLUSION It is important to consider normal reference ranges specific to pregnancy when interpreting some laboratory results that may be altered by the normal changes of pregnancy.

Database: Medline

9. Reference values for clinical chemistry tests during normal pregnancy.

**Author(s):** Larsson, A; Palm, M; Hansson, L-O; Axelsson, O

**Source:** BJOG: an international journal of obstetrics and gynaecology; Jun 2008; vol. 115 (no. 7); p. 874-881

**Publication Date:** Jun 2008

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 18485166

Available at [BJOG: an international journal of obstetrics and gynaecology](http://www.bjog.org) - from Wiley Online Library Science, Technology and Medicine Collection 2017

**Abstract:** OBJECTIVE Reference values are usually defined based on blood samples from healthy men or nonpregnant women. This is not optimal as many biological markers change during pregnancy and adequate reference values are of importance for correct clinical decisions. There are only few studies on the variations of laboratory tests during normal pregnancies, especially during the first two trimesters. It is thus a need to establish such reference values. DESIGN Longitudinal study of laboratory markers in normal pregnancies. SETTING Uppsala University Hospital, Sweden. POPULATION Healthy pregnant females. METHOD S We have studied 25 frequently used laboratory tests during 52 normal pregnancies. Each woman was sampled up to nine times and the samples were divided according to collection time into the following groups: gestational week 7 - 17; week 17 - 24; week 24 - 28; week 28 - 31; week 31 - 34; week 34 - 38; predelivery (0 - 2 weeks before delivery) and postpartum (> 6 weeks after delivery). The 2.5 and 97.5 percentiles for these markers were calculated according to the recommendations of the International Federation of Clinical Chemistry on the statistical treatment of reference values. RESULTS Reference intervals are reported for plasma alanine aminotransferase, albumin, alkaline phosphatase, pancreas amylase, apolipoprotein A1, apolipoprotein B, aspartate aminotransferase, bilirubin, calcium, chloride, creatinine, cystatin C, ferritin, gamma-glutamyltransferase, iron, lactate dehydrogenase, magnesium, phosphate, potassium, sodium, transferrin, triglycerides, thyroid-stimulating hormone, urate and urea during these pregnancy periods. CONCLUSION Most of the analytes change during normal pregnancy. It is thus of importance to use special reference values during pregnancy.

Database: Medline
10. Reference intervals for haematological variables during normal pregnancy and postpartum in 434 healthy Danish women.

Author(s): Milman, Nils; Bergholt, Thomas; Byg, Keld-Erik; Eriksen, Lisbeth; Hvas, Anne-Mette

Source: European journal of haematology; Jul 2007; vol. 79 (no. 1); p. 39-46

Publication Date: Jul 2007

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 17598837

Available at European journal of haematology - from Wiley Online Library Science, Technology and Medicine Collection 2017

Abstract: AIM To report reference intervals for haematological variables during normal pregnancy and postpartum. MATERIAL AND METHODS The series comprised 434 healthy ethnic Danish women with a normal pregnancy > or =37 wk duration and a normal delivery with newborns weight >2500 g. Blood samples were obtained at 18, 32 and 39 wk gestation and at 8 wk postpartum. The following variables were analysed: Haemoglobin (Hb), haematocrit (Hct), blood erythrocyte count, mean corpuscular volume, mean corpuscular haemoglobin, mean corpuscular haemoglobin concentration, white cell count, platelet count, erythrocyte folate, plasma folate, plasma cobalamin, plasma methylmalonic acid, plasma total homocysteine, serum ferritin, serum soluble transferrin receptor and plasma creatinine. Reference intervals were calculated using log(10)-transformed values (which showed normal distributions) as mean +/- 1.96 x SD. RESULTS The lower reference value for Hb during pregnancy was 6.45 mmol/L (105 g/L) and 7.3 mmol/L (118 g/L) postpartum. The lower reference value for Hct was 0.31 in pregnancy and 0.35 postpartum. There was a gradual decline in the lower reference value for erythrocyte folate during pregnancy and postpartum from 0.46 to 0.29 micromol/L and in plasma folate from 6 to 4 nmol/L. Lower reference value for plasma cobalamin declined during pregnancy from 96 to 71 pmol/L, but increased postpartum to 148 pmol/L. Upper reference value for plasma homocysteine increased gradually during pregnancy and postpartum from 11.0 to 20.6 micromol/L. Geometric mean serum ferritin at 18 wk gestation was 32 microg/L. Plasma creatinine values were low during pregnancy and displayed a significant increase postpartum. CONCLUSION The characteristic changes occurring in haematological indices during pregnancy and postpartum are described in this study. The results may be used as reference values in the assessment of health status of pregnant women with a similar socio-economic and racial background.

Database: Medline
11. New reference values for routine blood samples and human neutrophilic lipocalin during third-trimester pregnancy.

**Author(s):** Edelstam, G; Löwbeer, C; Kral, G; Gustafsson, S A; Venge, P

**Source:** Scandinavian journal of clinical and laboratory investigation; 2001; vol. 61 (no. 8); p. 583-592

**Publication Date:** 2001

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 11768317

**Abstract:** Reference values are usually based on blood samples from healthy men or non-pregnant women. Blood samples from pregnant women may be compared with these reference values. Correct references for pregnancy can be extremely important for clinical decisions such as ablatio placentae, appendicitis, premature rupture of membranes and preeclampsia. Previous studies of normal variations during third-trimester pregnancy are incomplete. Blood samples during pregnancy weeks 33, 36 and 39 as well as 1-3 h postpartum were collected from pregnant women with dietary iron supplement and at least one previous pregnancy without a history of hypertension or preeclampsia. When the sampled values were compared with the present reference values from men and non-pregnant women, the following differences were found during normal pregnancy: Haemoglobin and ferritin were reduced, CRP was slightly elevated, WBC (white blood cell count) and HNL (human neutrophilic lipocalin) were elevated during pregnancy and significantly increased postpartum. Albumin was reduced. ALT and AST were slightly elevated and GGT was unchanged during pregnancy. ALP, D-dimer and fibrinogen were elevated. Uric acid increased during the third trimester and thrombocyte count decreased. Separate reference values for pregnant women are essential for correct diagnostic decisions during third-trimester pregnancy. Elevated levels of D-dimer do not necessarily indicate ablatio placentae. A diagnosis of progressive preeclampsia cannot be based on increasing uric acid levels and reduced platelet count in a stable clinical condition. HNL signals activation of neutrophilic granulocytes and can thereby offer a helpful tool for diagnosing infection during pregnancy and postpartum.

**Database:** Medline

**Author(s):** Boehlen, F; Hohlfeld, P; Extermann, P; Perneger, T V; de Moerloose, P

**Source:** Obstetrics and gynecology; Jan 2000; vol. 95 (no. 1); p. 29-33

**Publication Date:** Jan 2000

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 10636497

**Available at Obstetrics and gynecology - from Ovid (LWW Total Access Collection 2015 - Q1 with Neurology)**

**Abstract:**

**OBJECTIVE**
To assess the safety of a new platelet count threshold for the definition of maternal thrombocytopenia late in pregnancy.

**METHODS**
Platelet count was performed in 6770 pregnant women late in pregnancy and in 6103 of their newborns as well as in a control group of 287 age-matched nonpregnant healthy women.

**RESULTS**
The prevalence of maternal thrombocytopenia (platelet count less than 150 x 10^9/L) was 11.6%. The mean platelet counts (248 compared with 213 x 10^9/L) and 2.5th percentile (164 compared with 116 x 10^9/L) were significantly higher in healthy nonpregnant women than in pregnant women. Among thrombocytopenic pregnant women, 621 (79%) had platelet counts between 116 and 149 x 10^9/L; none (0%; 95% confidence interval 0, 0.6) had complications related to thrombocytopenia, and none of their newborns had severe thrombocytopenia (platelet count less than 20 x 10^9/L).

**CONCLUSION**
In healthy pregnant women, a platelet count over 115 x 10^9/L late in pregnancy does not require further investigation during pregnancy and may be considered a safe threshold.

**Database:** Medline


**Author(s):** Gatti, L; Tenconi, P M; Guarneri, D; Bertulessi, C; Ossola, M W; Bosco, P; Gianotti, G A

**Source:** International journal of clinical & laboratory research; 1994; vol. 24 (no. 4); p. 217-219

**Publication Date:** 1994

**Publication Type(s):** Journal Article

**PubMedID:** 7894047

**Abstract:**
Nineteen pregnant women with uncomplicated pregnancies were studied during the first, second, and third trimesters. We measured the following hemostatic parameters: prothrombin time, activated partial thromboplastin time, fibrinogen, antithrombin III, protein C, protein S, platelet number and volume. Platelet function was examined by a cytofluorimetric method, using an anti-GPM-140 antibody which is directed against a platelet alpha granule membrane protein. Activated platelets were expressed as a percentage of the GMP-140-positive platelets over total platelets. Fibrinogen levels showed a steady increase during pregnancy; conversely prothrombin time, activated partial thromboplastin time, protein C, and antithrombin III showed no significant modifications and remained within the reference range. There was a decrease of protein S activity throughout pregnancy, although protein S antigen did not follow this trend. The decrease occurred early in pregnancy and persisted during the second and third trimesters, reaching a stable plateau. We observed no platelet volume change or activation: the percentage of activated platelets was within the normal reference range, even in late pregnancy.

**Database:** Medline
14. Reference ranges for haematology parameters in pregnancy derived from patient populations.

**Author(s):** Balloch, A J; Cauchi, M N  
**Source:** Clinical and laboratory haematology; 1993; vol. 15 (no. 1); p. 7-14  
**Publication Date:** 1993  
**Publication Type(s):** Journal Article  
**PubMedID:** 8472501  
**Abstract:** Reference ranges for several haematology parameters in pregnancy were determined by the mathematical detection of Gaussian and Gamma distributions in partitioned but unselected patient data. For each trimester, red cell parameters were shown to be well described by Gaussian distributions. Platelet and white cell parameters were best described by Gamma distributions with the exception of eosinophil and basophil counts for which neither distribution was applicable. The reference ranges derived for each trimester are compared.

**Database:** Medline

15. Platelets and leucocyte counts in pregnancy.

**Author(s):** Karim, S A; Khurshid, M; Rizvi, J H; Jafarey, S N; Rizwana, I  
**Source:** JPMA. The Journal of the Pakistan Medical Association; Apr 1992; vol. 42 (no. 4); p. 86-87  
**Publication Date:** Apr 1992  
**Publication Type(s):** Journal Article  
**PubMedID:** 1597923  
**Abstract:** A study involving the obstetric clinic population of 3 major teaching hospitals of Karachi has been conducted to define changes in leucocyte and platelet counts as pregnancy progresses. 573 "normal" pregnant women--183 in the first trimester, 195 in the second trimester and 194 in the third trimester were included in this analysis. We have found leucocytosis to be a feature of normal pregnancy; the change is subsequent to a progressive increase in granulocytes. Platelet counts were found to decrease slightly as pregnancy progresses.

**Database:** Medline

16. Platelet count in normal, small, and anemic fetuses.

**Author(s):** Van den Hof, M C; Nicolaides, K H  
**Source:** American journal of obstetrics and gynecology; Mar 1990; vol. 162 (no. 3); p. 735-739  
**Publication Date:** Mar 1990  
**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article  
**PubMedID:** 2107744  
**Abstract:** A reference range for fetal platelet count with gestation was established from the study of samples obtained by cordocentesis from 229 pregnancies that had prenatal diagnosis. The mean platelet count increased from 187 +/- 47 x 10(9)/L at 15 weeks to 274 +/- 47 x 10(9)/L at 40 weeks' gestation. In 113 red cell isoimmunized pregnancies, the moderately anemic fetuses were significantly thrombocytopenic, whereas the severely anemic fetuses were thrombocytopenic. In 136 small-for-gestational-age fetuses the platelet count was reduced and there were significant correlations between the magnitude of the thrombocytopenia and the degree of fetal smallness, hypoxemia, and acidemia.

**Database:** Medline
17. Platelet parameters. Part I. Platelet counts and mean platelet volume in normal and pregnant subjects.

**Author(s):** Lamparelli, R D; Baynes, R D; Atkinson, P; Bezwoda, W R; Mendelow, B V

**Source:** South African medical journal = Suid-Afrikaanse tydskrif vir geneeskunde; Jan 1988; vol. 73 (no. 1); p. 36-39

**Publication Date:** Jan 1988

**Publication Type(s):** Journal Article

**PubMedID:** 3340899

**Abstract:** Platelet counts and mean platelet volume (MPV) were studied in 564 normal subjects and 297 pregnant women using a Coulter Model S-Plus electronic counter. The reproducibility of these measurements both intra- and inter-sample was documented. The mean platelet count in the normal group was 283 x 10^9/l while the mean MPV was 9.32 fl. An inverse correlation between platelet volume and platelet number was documented (r = -0.38; P less than 0.0001). By interval analysis, this inverse relationship was shown to be non-linear. In the pregnant subjects there appeared to be a progressive decrease in platelet count with advancing gestation; this reached a significant level when the first and third trimesters were compared with each other (P less than 0.05). The MPV was unchanged. The fact that the platelet count decreased in proportion to the red cell count suggested that a common factor, such as haemodilution, was in part responsible. There was again an inverse relationship between MPV and platelet number (r = -0.39; P less than 0.0001) shown to be non-linear by interval analysis.

**Database:** Medline

18. Platelet function and coagulation in normal and preeclamptic pregnancy.

**Author(s):** Pekonen, F; Rasi, V; Ammälä, M; Viinikka, L; Ylikorkala, O

**Source:** Thrombosis research; Sep 1986; vol. 43 (no. 5); p. 553-560

**Publication Date:** Sep 1986

**Publication Type(s):** Research Support, Non-u.s. Gov't Comparative Study Journal Article

**PubMedID:** 2944245

**Abstract:** Platelet function and coagulation activity were followed prospectively throughout normal pregnancy and in puerperium in 17 healthy women. Plasma beta-thromboglobulin reflecting platelet activation increased progressively during pregnancy. This was not accompanied by any changes in platelet count or lifespan nor in serum or plasma thromboxane B2 levels. The levels of both factor VIII:C and factor VIII:Ag increased, the former less than the latter resulting in a rise of the FVIII:Ag/FVIII:C ratio. Antithrombin III (AT III), however remained unaltered. FVIII:Ag/FVIII:C ratio was increased both in mild (n = 7) and severe (n = 9) preeclampsia, whereas beta-thromboglobulin was increased and AT III was decreased only in severe preeclampsia. Platelet count and lifespan, plasma and serum thromboxane B2 as well as FVIII:C were normal in severe preeclampsia.

**Database:** Medline
19. Longitudinal study of platelet indices during normal pregnancy.

**Author(s):** Tygart, S G; McRoyan, D K; Spinnato, J A; McRoyan, C J; Kitay, D Z

**Source:** American journal of obstetrics and gynecology; Apr 1986; vol. 154 (no. 4); p. 883-887

**Publication Date:** Apr 1986

**Publication Type(s):** Comparative Study Journal Article

**PubMedID:** 3963077

**Abstract:** The purpose of this longitudinal, prospective study was to define platelet indices during normal pregnancy and to compare them to normal nonpregnant values. Indices evaluated included platelet count, mean platelet volume, and platelet distribution width. No significant change occurred in the mean platelet count or mean platelet volume from the second to the third trimester; however, platelet distribution width increased progressively and significantly during this interval (p less than 0.0001). Mean platelet volume versus platelet count showed a significant inverse relationship (p less than 0.0001) and was congruent with normal nonpregnant values. Mean platelet volume versus platelet distribution width exhibited a significant direct relationship (p less than 0.03) that differed remarkably from normal nonpregnant values. These data support the concept of normal pregnancy as a compensated state of progressive platelet consumption. These findings may have important diagnostic and prognostic applications in discerning acute states of platelet consumption superimposed on the compensated consumption of normal pregnancy.

**Database:** Medline

20. Platelet values during normal pregnancy

**Author(s):** Sill P.R.; Lind T.; Walker W.

**Source:** British Journal of Obstetrics and Gynaecology; 1985; vol. 92 (no. 5); p. 480-483

**Publication Date:** 1985

**Publication Type(s):** Article

**PubMedID:** 3994930

**Abstract:** Blood samples were obtained from 26 healthy women at regular intervals throughout pregnancy and analysed using a Coulter Counter Model S Plus III. The mean values for the various haematological indices at each stage of gestation were first calculated; the platelet count showed a small decrease throughout pregnancy as did haemoglobin concentration while there was an apparent increase in mean platelet volume, platelet distribution width and white cell count. However, analysis of the trends within patients did not always reflect these mean changes; there was considerable variation in platelet count within individuals and the apparent fall in the group as a whole was accounted for by a considerable fall in a few individuals. The assumption that the trends in platelet values determined from groups of patients will indicate how individual pregnant women behave is misleading.

**Database:** EMBASE
21. Platelet count during normal pregnancy

Author(s): Harrison K.L.; Bramich L.; Collins K.A.
Source: Australian and New Zealand Journal of Obstetrics and Gynaecology; 1982; vol. 22 (no. 2); p. 74-75
Publication Date: 1982
Publication Type(s): Article
PubMedID: 6958255

Abstract: Platelet counts were performed on 1,020 normal patients at different stages of pregnancy. Patients with complications of pregnancy known to influence the platelet count were excluded from the study. There was no evidence of any significant change in platelet count during pregnancy.

Database: EMBASE

22. The platelet count in pregnancy

Author(s): Fenton V.; Saunders K.; Cavill I.
Source: Journal of Clinical Pathology; 1977; vol. 30 (no. 1); p. 68-69
Publication Date: 1977
Publication Type(s): Article
PubMedID: 838873

Abstract: The platelet count was measured at approximately monthly intervals during the course of 44 normal pregnancies. There was no evidence of any fall in the platelet count during pregnancy. Any significant change in the platelet count in pregnant women is unlikely to be the result of a normal pregnancy.

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