



# A Prospective Study of Thrombocytopenia in all Trimesters of Pregnant Women in Baquba City in Iraq

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## Abstract

**Background:** In pregnancy there is decrease in platelet count mainly in late stage, which is normal physiological phenomena in third trimester, thrombocytopenia is a second common hematological condition affecting pregnant women after anaemia, unless its severe, otherwise it require no treatment.

**Objective:** To estimate and evaluate the platelet count during different trimester of pregnancy, with presence or absence of thrombocytopenia.

**Patients and Methods:** Platelet count was performed on pregnant women attending Al-Batool Teaching Hospital for Maternity and Paediatric in Baquba - Diyala, and some private clinic and laboratories in Baquba, during the period from March 2013 to November 2015 . Ninety pregnant women were included in the study group and thirty healthy non pregnant women as control group. Platelets count were done for them using automated hematology auto-analysers ABX-Horiba Micros 60, and comparison in platelets counts done between study group and control group and between different trimesters of pregnancy.

**Results:** Platelet count were lower in pregnancy with range (57-399) in compared with control group with range (166-399), and its lower in third trimester mean(208.69) in compared with other trimesters (first and second with mean 262.96 , 261.56 respectively) and the differences were statistically significant  $p < 0.001$ .

**Conclusion:** In this study we find a mild thrombocytopenia during pregnancy especially in third trimester, but this had no effect on mother, fetus and may not cause bleeding complication of delivery, which need only monthly follow up.

**Key words:** Pregnancy, thrombocytopenia, trimester, platelet.

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## Introduction

Thrombocytopenia occur in about 8-10 % of pregnant women which is due to different causes[1]but if we exclude other medical obstetrical conditions, the incidence drop to 5.1% [2].

Thrombocytopenia considered as second common hematological problem after anaemia [3]. Anaemia, thrombocytopenia and leukocytosis are most hematological

problems in pregnancy, as this problem affect the general health of women and outcome of pregnancy, with the effect on the fetus and newborn baby, so careful study of these changes is important.

On the other hand, Gestational Thrombocytopenia (GT) is considered as most common cause of thrombocytopenia in pregnancy which account about 75% of all causes of thrombocytopenia in pregnancy



[1][3-5], most probably due to hemodilution and increase platelet consumption and destruction in placenta[6]. Other causes include pregnancy induce hypertension, immune thrombocytopenic purpura (ITP), preeclampsia, HELLP syndrome, immune disorders, thrombotic thrombocytopenic purpura (TTP), and others[6]. As different studies regards the most common cause of thrombocytopenia is GT which define as mild to moderate decrease in platelet count in pregnancy, asymptomatic with no history of bleeding and had normal platelet count in preconception or early pregnancy, and platelet count return to normal 2-12 week postpartum period, also require no treatment[7-12]. Also there is no risk on mother and fetus and does not change the incidence of fetal thrombocytopenia[13-17]. but severe GT is less than 0.1% which documented in several studies, which more frequent in women who had previous history of thrombocytopenia during pregnancy and may affect platelet count of fetus and newborn baby [18][19]. This decrease in platelet count during pregnancy mostly due to hemodilution and increased platelet destruction in placenta which become more obvious in 3rd trimester [20][21] especially if we consider that in normal pregnancy characterized by increase in platelet aggregation and decrease number of circulating platelet (platelet life span decline and MPV raised mainly during pregnancy) [22].

Most studies took thrombocytopenia in pregnancy with specific cause, and only few have compare between different etiology using lower limit of normal range (150 x 10<sup>9</sup>/L), but it is acceptable that GT with mild thrombocytopenia (above 100 x 10<sup>9</sup>/L) is good with no major complications [23-27], while previously thrombocytopenia in non-hypertensive pregnant women was considered as ITP, but after 1988 thrombocytopenia in normal pregnancy was

considered as non-immune reduction of platelet count[28].

The aim of this study is to estimate and evaluate the platelet count with presence or absence of thrombocytopenia in the three trimester of pregnancy and compare three trimesters with each other with its own platelet count, which give good information for obstetrician and gynecologists to follow up the pregnant women with changes of platelet count.

## Patients and Methods

A prospective study was conducted on 90 pregnant women in the three different trimesters of pregnancy were attended to outpatient laboratory of Al-Batool Teaching Hospital for Maternity and Paediatric in Baquba - Diyala, and some private clinic and laboratories in Baquba, during the period from March 2013 to November 2015 in Baquba city in Iraq, their age were between 15-42 years with mean age was 26.35, and 30 healthy non pregnant ladies as control group, their age were between (15-40 years) with mean age was (27.15). After taking consent, data was collected on a questionnaire including full gynecological and obstetrical history, medical history and examination for any sign of bleeding tendency, we include all pregnant women who had normal history without any medical or obstetrical disorders and we exclude pregnant women who had history of any hematological disorders mainly eclampsia, HELLP syndrome, or other systemic disorders like diabetes mellitus, renal diseases, liver disease, immune disorders (SLE, ITP and others) and do not take any medication that affecting platelet number or function.

Three milliliter of venous blood were collected in K3 EDTA tube, analysis of CBC (which include WBC, RBC count, hemoglobin concentration, hematocrit, MCV, MCH, MCHC, RDW and Platelet count) was done immediately after venesection by fully



automated hematology analyzer ABX-Horiba Micros 60 (which had standardization and calibration according manufacturers instruction).

**Statistical analysis**

All Date was analyzed by using SPSS program version 20; nominal variables were analyzed by using student t-test, with  $p < 0.05$  considered as statistically significant.

**Results**

The platelet count of pregnant women with control healthy non pregnant women with the highest and lowest parameters and mean± SD, shown in Table 1, which shows the platelet count in third trimester (57-370) with mean (208.69), is lower than in first(183-399) with mean (262.96), second trimesters (150-388) with mean (261.56) and control group (166-399) with mean (265.56).

Table 2 show comparisons between 1st, 2nd and 3rd trimesters of pregnancy with control group according to t-test, with appearance of p-value of each comparison, and we compare each trimester with other for its own platelet count with its significance, there is no significance between 1st trimester and control group ( $p > 0.05$ ), but there is significant difference between 3rd trimester and control group ( $p < 0.001$ ), also a significant difference between 1<sup>st</sup> vs 2<sup>nd</sup>, 1<sup>st</sup> vs 3<sup>rd</sup> and 2<sup>nd</sup> vs 3<sup>rd</sup> trimesters ( $p < 0.001$ ).

So we improve that, the platelet count is significantly lower in third trimester in comparison with 1<sup>st</sup>, 2<sup>nd</sup> trimesters of pregnancy and control group.

**Table (1):** Platelet count in pregnant and control groups of patients.

Trimester of pregnancy	No.	Mean platelet Count ±	SD	Highest	Lowest
Control	30	265.56	68.288	399	166
First	30	262.96	58.414	399	183
Second	30	261.93	63.867	388	150
Third	30	208.69	76.462	370	57

**Table (2):** A comparisons of platelet count between pregnant and control group and between each trimesters.

Comparison	T	Significance
Control v 1st	0.956	$p > 0.05$
Control v 2nd	3.684	$p < 0.001$
Control v 3rd	8.123	$p < 0.001$
1st v 2 <sup>nd</sup>	2.97	$p < 0.001$
1st v 3 <sup>rd</sup>	7.813	$p < 0.001$
2nd v 3rd	4.466	$p < 0.001$

**Discussion**

Platelet count during pregnancy may keep within normal limits in majority of women, with slightly lower than in healthy non pregnant women [4][30]. In the present study there is also a significant decrease in platelet count in pregnant women, and this decrease

mainly seen in third trimester, this is agree with other studies, also a significant difference between each trimesters [ $p < 0.001$ ] this is disagree other study which show there is no statistically significant difference between 1<sup>st</sup> and 2<sup>nd</sup> trimesters only between



2nd and 3rd trimester there is significant difference in platelet count[28], we consider this changes in platelet count and mainly in 3rdtrimester as gestational thrombocytopenia, which agree with other study in our locality [31][32]. This agree with other study who find a gradual reduction in platelet count as pregnancy progress to late stage [33,5]. And this agree with American Society of Haematology that defines GT as, asymptomatic, with mild decrease in platelet count (PL > 70 x 10<sup>9</sup>/L) and mostly in 3rd trimester or in late pregnancy. In the same situation, the British Society of Haematology defines GT as mild thrombocytopenia which mostly seen in 3rd trimester of pregnancy (PL rarely less than 80 x 10<sup>9</sup>/L) [34].

So in the present study its normal to see a mild thrombocytopenia during pregnancy especially in 3rd trimester which require no active treatment especially if there is no any other medical or obstetrical disorder (before and during) pregnancy which agree with other study which show there is mild decrease in platelet count in pregnant women especially in third trimester [35]. Otherwise it should be carefully investigated especially if platelet count less than 50 x 10<sup>9</sup>/L [36].

In conclusion, there is mild thrombocytopenia(platelet count 100 -150x 10<sup>9</sup>/L)during pregnancy especially in 3rd trimester, with excluding of medical, obstetrical and gynecological problem that affecting platelet number and function, had no effect on mother, fetus and bleeding complication of delivery, and just need monthly follow up.

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