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# Mean Platelet Volume Levels in Pregnant Women having Thalassemia Minors

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**Abstract**

Aim: One of the designators of platelet functions is mean platelet volume. We aimed to compare mean platelet volume levels between the thalassemi minors pregnant women and normal pregnant women.
Methods: Files of 46 thalassemi minors pregnant women and 52 pregnant women without thalassemia minors or any other hematologic and metabolic disorders who applied to obstetrics and gynecology clinic were retrospectively evaluated. Groups were statistically compared regarding mean platelet volume values.
Results: There was no significant difference between the groups in terms of mean platelet volume and numbers of platelet ($p>0.05$). Mean platelet volume and platelet values in thalasemia minors pregnants have been relatively high in comparison to the control group but it didn`t reach statistical significiance.
Conclusion: According to our study results, there is no a clear association between thalassemia minors status and mean platelet volume.

**Key Words:** Mean Platelet Volume, Thalassemia minors, Pregnancy

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## Introduction

Beta thalassemia formed as a result of an inherited mutation in the beta globin gene is a disease caused by the construction of defective hemoglobin. Although approximately 200 gene mutations may cause the disease, common clinical phenotype is observed (1). The most significant feature of the disease is anemia and the severity of anemia change depending on the heterozygous and homozygous types (2,3,4). The presence of mutation in the unique chromosome is explained as beta thalassemia minor (5,6). Majority of thalassemia minors are

asymptomatic. In addition, it can be encountered with the signs of mild anemia (7,8). This anemia displays hypochromic microcytic character(6). Based on the World Health Organization data, the carriage rate in our country is 2.1% while this rate is 5.1% worldwide(3,4).

In the previous studies, an association with the coronary artery diseases and beta thalassemia minor has been established and development of acute myocardial infarction in some patients have been displayed (1,9,10,11). In spite of the studies, cause and effect relationship between thalassemia minor and coronary artery diseases has not been clearly revealed (1).

Platelet size is associated with the platelet function and activation (12). Hemostatic functions of big platelets are more (13). For his reason, mean platelet volume (MPV) is an important indicator for the activation of platelet, and its highness is an important finding for atherosclerosis (14).

In this study, we aimed to investigate association between thalassemia minors pregnants and MPV values since there is a relation between increased risk of ischemic heart disease and beta thalassemia, and also increased MPV values in atherosclerosis.

Material and Methods

This study was carried out with the approval of ethical committee of Mustafa Kemal University(numbered of 13). Thalassemi carrier pregnants and normal pregnants without thalassemia minors or systemic disorders that applied to obstetrics and gynecology outpatient clinic were retrospectively evaluated. MPV is stable during pregnancy (15-17). However, MPV is bigger than 11 fL in 28 week gestation is a risk factor for preeclampsia. For this reason, pregnants having preeclampsia were excluded in this study. Basal characteristics of women reached from files. MPV and platelet numbers in the complete blood count obtained during the routine follow-up were recorded. Pregnants whose platelet numbers are below 150.000/ µL and above 400.000/ µL were excluded in the study.

Statictical evaluation was made using SPSS 15.0 program. T test was used for the comparison of averages. Comparison of the fields was made with the Mann-Whitney U-test. Pearson correlation test was used while monitoring the correlation between parametric values. Spearman correlation test was used in order to monitor the correlation of non-parametric results. chi-square test was used in analyzing the two categorical variable.

**Results**

Files of 98 pregnants between 18-25 pregnancy week were scanned. 52 normal pregnants having no hematologic or systemic disease that came for routine pregnancy follow-up were included as the control group (Group I). 56 pregnant women that were diagnosed as thalassemia minor were included as the study group (Group II). No statistical differences in terms of age, pregnancy week, height, weight, systolic and diastolic blood pressure were found.

A meaningful difference between Group I and Group II was not found in terms of mean MPV and mean platelet values($p>0.05$). Although mean MPV and platelet values in Group II were higher than Group I, the difference did not reach statistical significiance.

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Table 1. Comparison of hematological parameters among the groups

| Parameter | Group 1 (n:52) | Group 2 (n:46) | Group comparisons (p value)* |
|---|---|---|---|
| MPV (fL) | 8.2±0.9 (6.4-11.1) | 8.5±1.4 (5.7-13.1) | P>0.05 (p:0.188) |
| PLT (×103/µL) | 256±57 (153-441) | 262±57 (151-410) | p>0.05 (p:0.626) |

values are given as mean ± SD
*p<0.05 is significant

## Discussion

Change in platelet count were observed in many disease. Many diseases inducing these changes could cause defects in the volume and function of the platelets. Platelet volumes in the circulation display a heterogenic spread. For this reason, mean platelet volume (MPV) is taken into consideration while evaluating the platelet volume (18). Generally, as the number of platelet decreases, MPV increases (19). In fact, it would be more accurate to say that MPV increases as the renewal speed of platelet increases (20).

Big platelets are more reactive, thus produce more prothrombotic factors and pile up easier (21, 22). So, MPV is accepted as the platelet activation indicator alone (15, 23). Increased MPV in idiopathic thrombocytopenic purpura (ITP) might demonstrate increase in the platelet destruction based on preeclampsia or sepsis. Decreased MPV might indicate hypersplenism or hypoplastic platelet production. Increased MPV values without thrombocytopenia is seen in chronic myeloid leukemia and heterozygotes thalassemia. MPV values decreases in chronic renal failure and uremic bleeding diathesis. There are small platelets and increased heterogenity in megaloblastic anemia (16).

Sarneke and his colleagues proved that anemia is an important risk factor for coronary artery disease (24). Shahriari proved that decreased hemoglobin levels in thalassemic patients is associated with ischemic heart disease (25). In the study made by Hashemi and his colleagues, no meaningful association between thalassemia minor and coronary artery disease was located (1). During acute myocardial infarction, we know that MPV increases and increased MPV is an independent risk factor for acute myocardial infarction (17, 26). In our study, although we were unable to locate any statistically meaningful association between thalassemic minor pregnants and control group in terms of MPV levels, we found that PLT and MPV values were higher in thalassemic minor group. We think that this situation is arisen from the limited number of the cases.

Several mechanisms have been put forward in order to explain the association among the

cardiovascular diseases in thalassemic minor patients. Some of these are increased cholesterol and LDL level, decreased blood viscosity based on decreased hemoglobin and hematocrit values and presence of hypertension in a small degree (24, 27, 28). In our study, there was no meaningful difference between two groups in terms of hypertension.

Cerebrovascular accident: Cerebrovascular diseases caused by hypertension are the most frequent neurological diseases in old people. Atherosclerotic lesions in the neck cause transient ischemic attacks, thrombotic or embolic strokes. After 1 month following the stroke, decreased platelet number and increased PV are found. This is up to increase of platelets consumption in infarct field (15, 17). There are publications showing the relationship between beta thalassemia minor and oxidative damage(4, 29).

Since the incidence of thalassemia minor in our country is high, many carrier pregnant women are examined in our clinic. Thalassemia minors status is associated with lots of diseases. Even though we were unable to find a relationship between thalassemia minors status and MPV in pregnant women, it is obvious that large scaled prospective studies are needed.

**Conflict of Interest: None.**

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