# Mean Platelet Volume in Patients with Migraine
## *Migrenli Hastalarda Ortalama Trombosit Hacmi*

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**Dear Editor,**

We have read Varol et al.'s study investigating platelet counts and mean platelet volume (MPV) in migraine patients (1) with great interest. We would like to make some comments on this study.

The article suggests that MPV is an indicator of platelet function and that platelet aggregation can be measured by means of MPV. The measurement of platelet functions became possible after platelet aggregometer device became available in laboratories. The turbidimetric platelet aggregometer that was developed in 1960's was a revolutionary advancement in terms of platelet function evaluation and diagnosis of certain pathological conditions, and it still remains to be the gold standard test of platelet functions. Today, the platelet parameters excluding platelet count and morphological platelet evaluation in peripheral propagation, and those that are provided by complete blood count devices are not being used in the evaluation of platelet functions (2). In healthy volunteers, Beyan et al. investigated whether the platelet aggregation responses that they acquired using adenosine triphosphate, collagen and epinephrine in turbidimetric platelet aggregometer are correlated to platelet parameters (3). In this study, they found no correlation between platelet parameters including MPV and platelet aggregation response and therefore proved that platelet parameters are not indicative of platelet aggregation. In a similar vein, De Luca et al.'s recent study with 1016 diabetic patients who underwent coronary angiography, MPV was found to be unrelated to platelet activitiy (4). Since MPV is simply an indicator of platelet production speed, the conclusions drawn on the basis of MPV values can neither support nor refute the existence of platelet function or hypercoagulopathy-related anomalies previously reported in patients with migraine. Similarly, considering that MPV is not related to platelet functions, it is very easy to see how the earlier studies cited in the article failed to find any MPV differences in migraine cases compared to controls.

Another important confounding factor in the study is the pre-analysis treatment distort the MPV measurement results (5). These relate to the type of anticoagulant agent used in blood count, time difference between sample acquisition and MPV measurement, and the difference of complete blood count devices and their technologies. When ethylenediaminetetraacetic acid (EDTA) is used as the anticoagulant in complete blood count, MPV increases up to 30% in the first 5 minutes, and another 10-15% in the next two hours with the impedance technology (6). Lance et al. tried to establish this relationship between the complete blood count anticoagulant and time in a study (7). According to their results, the time difference between sample acquisition and complete blood count should be 120 minutes when EDTA is used, and 60 minutes when citrate is used in order to achieve a standardized measurement of MPV. On the other hand, different devices and technologies used in MPV measurements can produce deviations that reach up to 40% (8). In this study, the analyses were done retrospectively, and therefore the time difference between sample acquisition and MPV measurement is not standardized despite the fact that EDTA was used as anticoagulant. Moreover, the name of the device or devices used in the measurement is not reported and their effect on the results is unknown. Therefore if multiple different complete blood count devices were used for the measurements in the study, the lower level of platelet counts in migraine patients compared to healthy controls can be explained by the difference in measurement technologies. Different complete blood count devices show varience in terms of lower count and upper count thresholds used in the particle measurement technologies, which would create artificial differences in the platelet counts (8).

In conclusion, MPV measurements should not be used as an indicator of platelet functions in patients with migraine. It is important to remember that MPV measurements should carefully be standardized in further studies.

Regards,

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