Mean Platelet Volume May Be Associated with Extent of Coronary Artery Disease

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Dear Editor,

We read with interest the article by Guvenç et al[1]. MPV is a widely used laboratory marker associated with platelet function based on inflammatory conditions[2]. Recently, increased levels of MPV were demonstrated in atrial fibrillation[3], cerebrovascular disease, peripheral artery disease, stroke, thyroid and inflammatory rheumatic diseases[4]. In conclusion, not only MPV but also red cell distribution width, neutrophil lymphocyte ratio[5], plateletcrit (PCT), platelet lymphocyte ratio, CRP, ferritin and uric acid are easy methods to evaluate the extent of CAD in patients with stable angina. These markers might be useful in clinical practice.

Keywords

Blood Platelet / metabolism; Coronary Artery Disease.

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References

1. Güvenç TS, Hasdemir H, Erer HB, Ilhan E, Ozcan KS, Calık AN, et al. Lower than normal mean platelet volume is associated with reduced extent of coronary artery disease. Arq Bras Cardiol. 2013;100(3):255-60.
2. Balta S, Demirkol S, Celik T, Kucuk U, Unlu M, Arslan Z, et al. Association between coronary artery ectasia and neutrophil-lymphocyte ratio. Angiology. 2013 Mar 7. [Epub ahead of print].
3. Balta S, Demirkol S, Kucuk U, Unlu M. Hemostatic markers can be pivotal roles of risk factors for new-onset atrial fibrillation. Platelets. 2013 Apr 3. [Epub ahead of print].
4. Demirkol S, Balta S, Unlu M, Yuksel UC, Celik T, Arslan Z, et al. Evaluation of the mean platelet volume in patients with cardiac syndrome X. Clinics (São Paulo). 2012;67(9):1019-22.
5. Cingoz F, Iyisoy A, Demirkol S, Sahin MA, Balta S, Celik T, et al. Carotid intima-media thickness in patients with slow coronary flow and its association with neutrophil-to-lymphocyte ratio: a preliminary report. Clin Appl Thromb Hemost. 2013 Apr 23. [Epub ahead of print].

Reply

We thank the authors for their constructive comments. Mean platelet volume (MPV) is considered as a promising marker to determine severity and prognosis of a variety of cardiovascular conditions[1]. As increased size is a sign of platelet immaturity and immature platelets have a tendency towards increased aggregation, it is generally considered that MPV is a marker of platelet reactivity[2]. It has also been hypothesized that the presence of larger platelets in circulation could be a cause of myocardial infarction, although this concept is not universally accepted[3].

To date, a notable exception for the usefulness of MPV was stable coronary artery disease (CAD), where MPV values were not related with the severity and even with the presence of CAD[3,4]. The present study is compatible with the previous literature for a wide range of MPV values, as MPV did not correlate with angiographic Gensini score. However, a secondary analysis showed that patients with mean platelet size below normal range (< 6.9 fL) had lower coronary atherosclerotic burden compared to those with normal (within-reference) MPV values[5]. This non-linear relationship of MPV with the severity of chronic CAD could explain why previous studies failed to show an association. From a clinical standpoint, this nonlinear relationship also severely limits MPV usefulness to a rather small number of stable CAD patients. Despite setbacks, our findings indicate MPV could still be a useful marker in chronic CAD, as less

severe CAD could be anticipated in patients with MPV value below 6.9 fL. It should be kept in mind that drawing conclusions from a single study could be dangerous and more studies are needed to ascertain this concept.

Mean platelet volume is not, however, the sole useful marker that could be obtained from complete blood count (CBC). Low hemoglobin is a well-known and validated parameter of prognosis in patients with CAD and studies have shown the usefulness of other red-cell related parameters, such as red cell count and red cell distribution width[6,7]. White cell count, individual white cell parameters and derivative markers such as neutrophil-lymphocyte ratio, were related with severity and prognosis of CAD[7]. Integrative use of these readily obtainable parameters with each other and with conventional CAD risk factors could give more clinically-relevant information than individual tests.

Although several small-sized or retrospective studies have repeatedly shown the value of MPV in a variety of cardiovascular conditions, clinical usefulness of MPV in large, randomized trials is yet to be demonstrated. This point was correctly emphasized in a recent review by Leader et al[8]. Conduction of properly-sized, prospective and randomized trials should be encouraged to evaluate the usefulness of MPV and similar CBC-based markers in clinical practice.

Sincerely

Tolga Sinan Güvenç

References

1. Chu SG, Becker RC, Berger PB, Bhatt DL, Eikelboom JW, Konkle B, et al. Mean platelet volume as a predictor of cardiovascular risk: a systematic review and meta-analysis. J Thromb Haemost. 2010;8(1):148-56.
2. Kamath S, Blann AD, Lip GY. Platelet activation: assessment and quantification. Eur Heart J. 2001;22(17):1561-71.
3. De Luca G, Santagostino M, Secco GG, Cassetti E, Giuliani L, Franchi E, et al. Mean platelet volume and the extent of coronary artery disease: results from a large prospective study. Atherosclerosis. 2009;206(1):292-7.
4. Ihara A, Kawamoto T, Matsumoto K, Shouno S, Hirahara C, Morimoto T, et al. Relationship between platelet indexes and coronary angiographic findings in patients with ischemic heart disease. Pathophysiol Haemost Thromb. 2006;35(5):376-9.
5. Güvenç TS, Hasdemir H, Erer HB, Ilhan E, Ozcan KS, Calık AN, et al. Lower than normal mean platelet volume is associated with reduced extent of coronary artery disease. Arq Bras Cardiol. 2013;100(3):255-60.
6. Ilhan E, Guvenç TS, Altay S, Çagdas M, Calik AN, Karaca M, et al. Predictive value of red cell distribution width in intrahospital mortality and postintervention thrombolysis in myocardial infarction flow in patients with acute anterior myocardial infarction. Coron Arter Dis. 2012;23(7):450-4.
7. Madjid M, Fatemi O. Components of the complete blood count as risk predictors for coronary heart disease: in-depth review and update. Tex Heart Inst J. 2013;40(1):17-29.
8. Leader A, Pereg D, Lishner M. Are platelet volume indices of clinical use? A multidisciplinary review. Ann Med. 2012;44(8):805-16.