



Letters to the Editor

Plateletcrit may not be a useful predictor in patients with slow coronary flow**Keywords:**

Angiography
Blood flow
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Dear Editor,

I read with great interest the research article by Akpinar et al. about plateletcrit (PCT) and red cell distribution width parameters in patients with slow coronary flow [1]. I would like to comment on this study.

Firstly, determinations of complete blood count were performed using a Beckman Coulter LH 780 analyzer (Beckman Coulter, Brea, CA, USA) in this study. According to the operator's guide for this analyzer, PCT and platelet distribution width (PDW) parameters are derived parameters and are for research use only. They should not be used in diagnostic procedures. Mean platelet volume (MPV) is measured directly from analysis of the platelet distribution curve and PCT is calculated according to the formula: $PCT = \text{platelet count} \times MPV / 10,000$. Therefore, reliability of PCT parameter is directly related to MPV parameter. Accurate measurements of platelet count and size are important for diagnostic, therapeutic, and research purposes. Lancé et al. reviewed the pre-analytical variability of the MPV and proposed a possible approach to standardization [2]. MPV is not a routine part of the complete blood count because of ethylenediaminetetraacetic acid (EDTA)-induced changes over time. EDTA-induced platelet shape changes result in a progressive increase in MPV with impedance technology. MPV increases up to 30% within 5 min of exposure and increases further by 10–15% over the next 2 h [3]. Lancé et al. performed a study to standardize the measurement of MPV. They suggested that timing is important when measuring the MPV and that the optimal measurement time should be 120 min after venipuncture [4]. The MPV measurement time was not defined in this retrospective study.

Furthermore, a cut-off value should not be defined for PCT because different technologies for measuring the MPV yield different results. The platelet parameters derived by the automated cell counter are highly specific to the individual technologies developed for each type of analyzer. Studies comparing results from these instruments have shown MPV differences of up to 40%.

Finally, the authors concluded that increased PCT might be used as a marker for more aggressive antiplatelet treatment in patients with slow coronary flow. Platelet parameters are not used as platelet function tests. Light transmission turbidometric platelet aggregometry is the current "gold standard" test of platelet function. Beyan et al. did not observe any correlation between platelet indices measured including platelet count, MPV, PDW,

PCT, and platelet aggregation responses with collagen, adenosine diphosphate, and epinephrine obtained with light transmission turbidometric platelet aggregometry in healthy subjects [5].

In conclusion, PCT or other platelet parameters may not be useful predictors in patients with slow coronary flow.

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Authors' response to the comments on automated platelet analyses by Dr Beyan

We appreciate the comments of Dr Beyan about the criticisms of automated platelet analyses focusing on our recent article in the *Journal of Cardiology* [1]. We add our voice to the Beyan letter that there are general pre-analytical, methodological, and technological difficulties in the fully automated methods for platelet counting and qualitative thrombocyte determination. The change in mean platelet volume (MPV) is time-dependent, being maximal in the first 2 h after the venous puncture. Anticoagulants have a significant effect on MPV. After exposure to ethylenediaminetetraacetic

acid (EDTA), platelets swell. This amounts to a 30% increase in volume in the first hour. MPV increases with time when measured by orifice impedance counting systems (Beckman Coulter, Brea, CA, USA; Sysmex, Kobe, Japan), on the contrary MPV decreases when measured by optical laser light scatter systems (Bayer, Leverkusen, Germany; Technicon, Tarrytown, NY, USA), possibly due to the dilution of cytoplasmic contents leading to a decrease in light scattering abilities [2]. We were aware of the general principle about MPV that “where retrospective analyses are undertaken on data from EDTA samples, then these are only acceptable if the sample has matured for at least 2 h and such studies are best confined to changes in individual patients results over time” as indicated previously by Patterson [2]. We have followed those routine practices in our published study [1].

MPV is calculated by dividing the plateletcrit (PCT), by the number of platelets, which is the same calculation as for the mean red cell volume (MCV), namely dividing hematocrit (Hct) by the red blood cells (RBC), and therefore PCT is analogous to the red cell Hct [3]. Red cell indices are widely used in clinics. On the other hand, platelet indices (other than the platelet count itself) are probably the most regularly ignored part of the automated complete blood count (CBC) parameters [2]. This general ignorance should be ascribed to the pre-analytical, methodological, and technological difficulties as discussed by Beyan. Similar problems are also present in the methods of the platelet aggregation and functional analyses [4,5]. Positive studies and meta-analyses [6,7] on the automated platelet analyses including our own study [1] focusing on coronary heart diseases cast long-term efforts about the validation, standardization, and technological improvements in the quantitative and qualitative determination of platelet parameters.

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