After stenosis of arteriovenous vascular access in hemodialysis patients, platelets play a crucial role in subsequent thrombus formation, leading to access failure" Shin et al (2017).

Abstract:

After stenosis of arteriovenous vascular access in hemodialysis patients, platelets play a crucial role in subsequent thrombus formation, leading to access failure. In a previous study, the mean platelet volume (MPV)/platelet count ratio, but not MPV alone, was shown to be an independent predictor of 4-year mortality after myocardial infarction. However, little is known about the potential influence of MPV/platelet count ratio on vascular access patency in hemodialysis patients. A total of 143 patients undergoing routine hemodialysis were recruited between January 2013 and February 2016. Vascular access failure (VAF) was defined as thrombosis or a decrease of greater than 50% of normal vessel diameter, requiring either surgical revision or percutaneous transluminal angioplasty. Cox proportional hazards model analysis ascertained that the change of MPV/platelet count ratio between baseline and 3 months [Δ(MPV/platelet count ratio)3mo-baseline] had prognostic value for VAF.

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Additionally, the changes of MPV/platelet count ratio over time were compared in patients

with and without VAF by using linear mixed model analysis. Of the 143 patients, 38 (26.6%) were diagnosed with VAF. During a median follow-up of 26.9 months (interquartile range 13.0-36.0 months), Δ(MPV/platelet count ratio)3mo-baseline significantly increased in patients with VAF compared to that in patients without VAF [11.6 (6.3-19.0) vs. 0.8 (-1.8-4.0), P< 0.001]. In multivariate analysis, Δ(MPV/platelet ratio count)3mo-baseline was an independent predictor of VAF, after adjusting for age, sex, diabetes, hypertension, coronary artery disease, cerebrovascular disease, vascular access type, the presence of previous VAF, and antiplatelet drug use (hazard ratio, 1.15; 95% confidence interval, 1.10-1.21; P< 0.001). Moreover, a liner mixed model revealed that there was a significant increase of MPV/platelet count ratio over time in patients with VAF compared to those without VAF (P< 0.001). An increase in MPV/platelet count ratio over time was an independent risk factor for VAF. Therefore, continuous monitoring of the MPV/platelet count ratio may be useful to screen the risk of VAF in patients undergoing routine hemodialysis.

Reference:

Shin, D.H., Rhee, S.Y., Jeon, H.J., Park, J.Y., Kang, S.W. and Oh, J. (2017) An Increase in Mean Platelet Volume/Platelet Count Ratio Is Associated with Vascular Access Failure in Hemodialysis Patients. PLoS One. 12(1), p.e0170357. eCollection 2017.

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