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## **Circulating vascular adhesion protein-1 level predicts risk of cardiovascular events and mortality in hemodialysis patients**

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**Objectives:** Vascular adhesion protein-1 (VAP-1) is an oxidative enzyme of primary amines that facilitates the transmigration of inflammatory cells. The oxidative and inflammatory effects of VAP-1 are prominently increased in pathological conditions such as metabolic, atherosclerotic, and cardiac diseases. However, the clinical significance of circulating VAP-1 levels in hemodialysis (HD) patients is unclear.

**Methods:** A total of 434 HD patients were prospectively enrolled between June 2016 and April 2019 as part of a prospective multicenter cohort study. Plasma VAP-1 levels were measured at the time of study data entry, and the primary endpoint was defined as a composite of cardiovascular (CV) events and cardiac events.

**Results:** Circulating VAP-1 levels were positively correlated with plasma levels of cardiac remodeling markers, including brain natriuretic peptides, galectin-3, and matrix metalloproteinase-2. Multivariate logistic regression analysis revealed that patients with higher circulating VAP-1 levels were more likely to have left ventricular (LV) diastolic dysfunction (odds ratio, 1.40; 95% confidence interval [CI], 1.04–1.88). The cumulative event rate of the composite of CV events was significantly greater in VAP-1 tertile 3 than in VAP-1 tertiles 1 and 2 ( $P = 0.009$ ). Patients with VAP-1 levels in tertile 3 were also associated with an increased cumulative event rate of cardiac events ( $P = 0.015$ ). The VAP-1 tertile 3 was associated with a 2.06-fold higher risk of the composite of CV events (95% CI, 1.10–3.85) and 2.06-fold higher risk of cardiac events (95% CI, 1.03–4.12) after adjustment for multiple variables.

**Conclusions:** Plasma VAP-1 levels had the positive relationship with circulating levels of cardiac pathology markers and LV diastolic dysfunction. Higher VAP-1 levels were also associated with an increased risk of incident CV events and cardiac events in HD patients. Our results indicate that VAP-1 help clinicians identify those at high risk of CV events.