Could VEGF-D level have a role in clinical risk scoring, estimation of thrombus burden, and treatment in acute pulmonary thromboembolism?

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Abstract

Objective: Pulmonary embolism (PE) is usually a complication of deep vein thrombosis and is an important cause of mortality and morbidity. Vascular endothelial growth factor D (VEGF-D) is a secretory protein that plays a role in the remodeling of blood vessels and the lymphatic system. This study aimed to determine the relationship between VEGF-D level and clinical risk scoring in patients with PE. Methods: The study included 117 patients admitted for PE that were divided into 4 groups: high-risk patients (n=35), high-intermediate-risk patients (n=30), low-intermediate-risk patients (n=24), and low-risk patients (n=28). Plasma VEGF-D was measured from peripheral venous blood samples (5 cc) using a commercial enzyme-linked immunosorbent assay (ELISA) kit. Pulmonary Artery Obstruction Index (PAOI) was calculated from CT angiography imaging. Results: VEGF-D levels in the low-risk PE group differed significantly from those in the high-intermediate and high-risk groups (p=0.001 for both) but not from that in the low-intermediate-risk PE group (p=0.155). There was no significant difference in troponin-I and NT-proBNP levels between the high-intermediate-risk and high-risk PE patients, whereas VEGF-D levels differed significantly (p=0.134, p=0.146, p=0.016). VEGF-D level was moderately correlated with mean pulmonary artery pressure and PAOI (r=0.481, p=0.01; r=0.404, p=0.01). In ROC curve analysis, a cut-off of 370.1 pg/ml for VEGF-D had 91.4% sensitivity and 67.4% specificity in the differentiation of high-intermediate-risk and high-risk PE patients. Conclusion: This study showed that plasma VEGF-D level was more reliable than troponin-I and NT-proBNP in clinical risk scoring and demonstrating thrombus burden. VEGF-D can be used as a biomarker in clinical risk scoring and estimation of thrombus burden in patients with acute PE.

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