D-Dimer, a Biomarker for Diagnosis and Prognosis Assessment of COVID-19

Cheepsattayakorn A[1,2]*, Cheepsattayakorn R[3] and Siriwanarangsun P[1]

[1]Faculty of Medicine, Western University, Thailand

[2]10th Zonal Tuberculosis and Chest Disease Center, Chiang Mai University, Thailand

[3]Department of Pathology, Chiang Mai University, Thailand

*Corresponding author: Attapon Cheepsattayakorn, 10th Zonal Tuberculosis and Chest Disease Center, 143 Sridornchai Road Changklan Muang Chiang Mai 50100 Thailand, Tel: 6653140767; 6653 276364; Fax: 6653140773; 6653273590; Email: Attapon1958@gmail.com

Editorial

Coagulopathy [1] and increased levels of antiphospholipid antibodies [2] are more prevalent in critically ill-COVID-19 patients and may predispose patients to both arterial and venous thrombotic diseases, due to blood circulation stasis, endothelial dysfunction, platelet activation, and excessive inflammation. D-dimer, a marker of fibrinolysis and a proxy for ongoing thrombosis is the sensitive change in coagulation parameters in COVID-19, whereas it has low specificity for the detection of venous thromboembolism [3]. A retrospective cohort study in France demonstrated that D-dimer levels at baseline significantly higher in patients with deep venous thrombosis (DVT) (p < 0.001), whereas the positive predictive values for venous thromboembolism (VTE) for baseline D-dimer levels that were equal to 1.0μg/mL or more and more than 3μg/mL were 44% and 67%, respectively and the negative predictive values for baseline D-dimer levels that was less than 1.0 μg/mL for VTE and pulmonary embolism (PE) were 90% and 98%, respectively [4]. VTE risk was predicted by elevated D-dimer concentrations of more than 1.0μg/mL [4]. In another prospective study of 165 consecutive hospitalized-non-intensive-care-unit-COVID-19-related pneumonia patients with D-dimer levels of more than 1,000ng/mL and complete compression doppler ultrasonography screening revealed that the D-dimer levels were higher in diagnosed-DVT patients, compared to other patients (4,527ng/mL vs. 2,050ng/mL; p<0.001) [5]. He, et al. demonstrated that a D-dimer level of 2.025mg/L was the suitable probability cutoff or a prognosis of death, whereas male gender, advanced age, dyspnea, and some underlying diseases were the influencing factors D-dimer levels impacting COVID-19 prognosis [6], whereas Poudel, et al. demonstrated that D-dimer level of 1.5μg/mL on hospital admission is the proper cutoff level for predicting the mortality in COVID-19 patients [7]. Zhan, et al. conducted a meta-analysis and meta-regression on diagnostic value of D-dimer levels in COVID-19 patients and revealed that the specificity of the prognostic performance of D-dimer levels for the severity, mortality, and VTE in COVID-19 were 71%(95% CI: 64%-77%), 83%(95% CI: 77%-87%) and 60%(95% CI: 60%-60%), respectively, and the pooled sensitivity were 77%(95% CI: 73%-80%), 75%(95% CI: 65%-82%) and 90%(95% CI: 90%-90%) respectively [8].

In conclusion, D-dimer level testing is not useful for the diagnosis of PE due to low positive predictive values of increased D-dimer levels. The high levels of D-dimer in COVID-19 patients do not definitely making the diagnosis of DVT, but can be used for screening VTE-related-COVID-19. Reduction in D-dimer levels may correlate with COVID-19 clinical improvement.

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Cheepsattayakorn A, et al. D-Dimer, a Biomarker for Diagnosis and Prognosis Assessment of COVID-19. J Pulmon Respir Sci 2021, 6(1): 000149.

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