

Reviewing the Well's Criteria in the Context of COVID-19 Pandemic

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ABSTRACT

The Well's criteria for pulmonary embolism (PE) is a risk stratification score and clinical decision rule to estimate the probability for acute PE in patients in which history and examination suggests acute PE is a diagnostic possibility. Wells criteria include clinical symptoms of deep venous thrombosis (DVT), such as leg swelling, pain with palpation (3 points), other diagnosis less likely than pulmonary embolism (3 points), heart rate >100 beats per minute (1.5 points), immobilization (≥ 3 days) or surgery in the previous four weeks (1.5 points), previous DVT/PE (1.5 points), hemoptysis (1 point) and malignancy (1 point). According to traditional clinical probability assessment the likelihood of diagnosing PE is high if the score is more than 6, moderate for the score between 2 and 6, and low if the score is less than 2. According to modified Wells criteria PE is likely if the score is more than 4, and unlikely if the score is less than 4. Both natural spike protein (SARS-CoV-2 infection) and artificial spike protein (spike-protein based vaccines) may be associated with an increased risk for the development of thromboembolism. Studies have shown that spike protein alone can damage vascular endothelial cells by down-regulating ACE2 and consequently inhibiting mitochondrial function and that spike-induced degradation of endothelial junctional proteins affects endothelial barrier function, which causes vascular damage. Results of a study detected a safety signal for venous thromboembolism (VTE) after first-dose of BNT162b2 (Pfizer/BioNTech) and a similar estimate was seen for first-dose of ChAdOx1 (AstraZeneca/Oxford). There was a 1.3-fold increase in the rate of VTE after first-dose of BNT162b2 compared with an 8-fold increase after diagnosis of COVID-19. I propose that both recent (in the previous 4 weeks) COVID-19 infection and spike-protein based vaccination may be included in the Wells criteria and scored 1 point for COVID-19 and 0.5 points for recent spike-protein based vaccination in a patient with symptoms typical for pulmonary embolism and/or deep venous thrombosis.

Keywords: COVID-19, Well's criteria, Pulmonary embolism, Deep venous thrombosis

Abbreviations: PE: Pulmonary Embolism; DVT: Deep Venous Thrombosis; VTE: Venous Thromboembolism

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