



Proximal and isolated distal deep vein thrombosis and Wells score accuracy in hospitalized patients

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The diagnosis of deep vein thrombosis (DVT) of the lower extremities based on clinical evaluation alone is unreliable due to the poor specificity of the signs and symptoms. While compression ultrasonography is warranted to establish or rule out the diagnosis, DVT is confirmed in only about 20–25% of individuals with a clinical suspicion. In the outpatient setting, diagnostic algorithms that sequentially apply a clinical decision rule (e.g., the Wells rule) and D-dimer testing have been extensively evaluated to decide which individuals could safely avoid imaging to reduce patient burden and healthcare costs [1]. The utility of clinical decision rules for risk stratification is less well established among hospitalized patients.

This question was addressed by Sartori [2] and colleagues who evaluated the accuracy of the Wells rule in 634 hospitalized patients with suspected DVT. The prevalence of DVT diagnosed by complete (whole-leg) ultrasound was 20%, with 60% of cases represented by isolated distal DVT. The discriminatory accuracy of the Wells score expressed as the area under the receiver operating characteristics curve was low for overall DVT and isolated distal DVT, whereas a higher performance was observed for proximal DVT (0.67, 0.58, and 0.75, respectively).

This work raises a number of clinically relevant issues. The observation of a high proportion of isolated distal DVTs fuels the discussion over the clinical relevance of calf DVT, which is not systematically sought in centers using limited

compression ultrasonography. When isolated distal DVT is diagnosed, the suggested management varies broadly from clinical surveillance, shorter courses of anticoagulation to standard anticoagulant regimens in patients with severe symptoms or risk factors for thrombosis extension. Establishing a diagnosis of isolated calf DVT may be important even if anticoagulation is not instituted as it provides information on the risk of recurrent DVT, subsequent diagnosis of cancer, and chronic venous insufficiency [3]. The evaluation of clinically suspected DVT by complete ultrasonography as in the study of Sartori and colleagues may allow the prompt detection and management of distal DVTs, provide insights into cases of symptom progression among patients with calf DVT in whom anticoagulation is withheld, and exclude alternative diagnoses in patients without thrombosis.

The failure rate of the Wells rule, representing the probability of DVT in patients with a low probability score, was 9.8%, decreasing to 2% when only proximal DVT was considered. Although the latter rate is similar to that observed in the outpatients setting, the confidence intervals were broad with an upper limit of 4.7%, which may be regarded as too high to forego further testing. In a previous study on 1135 hospitalized patients, Silveira [4] and colleagues reported a failure rate of the Wells rule as high as 5.9%, which again suggests that using the low-probability Wells score category to avoid ultrasonography in hospitalized patients may be unsafe.

Another important measure of the value of the Wells rule in hospitalized patients is the efficiency, which represents the proportion of patients in whom DVT can be excluded based on a low-probability Wells score category. The efficiency was 38% in the study of Sartori and colleagues, and only 11.9% in Silveira's for a pooled efficiency of 20%, which is significantly lower compared to an efficiency of about 55% observed in the outpatient setting. A reduced efficiency of the Wells rule in hospitalized patients is not surprising given that nonspecific physical findings and comorbidities such as active cancer or bedridden status are all relatively common

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and tend to inflate the score. As a result, a low proportion of patients is assigned to the low-probability Wells score category, and many patients without DVT are considered as at moderate to high probability [5]. The prevalence of the individual Wells items and Wells score distribution may vary between surgical and medical inpatients [4]. Further studies are warranted to clarify whether this variability results in different performances of the Wells rule among these hospitalized populations.

In the outpatient setting, the efficiency of clinical decision rules is increased by their combination with D-dimer testing. However, this strategy has not been extensively evaluated in hospitalized patients [2, 4]. D-dimer was not available in the study of Sartori and colleagues, and it was ordered in just 8% of Silveira's patients who tested positive in 93% of cases. D-dimer has low specificity in hospitalized patients in whom it is often elevated independently of thrombosis owing to other comorbidities. Therefore, while the safety of ruling out DVT based on a low-probability Wells score and a negative D-dimer test requires further evaluation, it is likely that this combination of test findings would be rather infrequent with limited effect on efficiency. The use of an age-adjusted or clinical probability-adjusted D-dimer has increased the efficiency of the diagnostic workup of ambulatory patients, but experience in the hospital setting is lacking [6, 7].

Will the results of Sartori's study change the approach to DVT diagnosis in hospitalized patients? The use of the Wells rule may assist management at times when ultrasonography is not immediately available. The findings of Sartori and colleagues suggest that patients with moderate to high clinical probability Wells score could receive empirical anticoagulation, arranging ultrasonography on the following day, as it may occur in outpatient and emergency settings. It should be noted, however, that while the prevalence of DVT in outpatients with a high probability Wells score is around 50% (53%; 95% CI, 44–61%), the prevalence drops to 16–26% among inpatients [2, 4, 5]. Clinicians may regard this probability as too low when assessing the benefit-to-risk balance of giving an anticoagulant before imaging confirmation. While further studies are needed to support the use of the Wells rule for empirical anticoagulation among inpatients when ultrasonography is not readily available, these cases will be typically anticoagulated in many centers.

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Compliance with ethical standards

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