



A STUDY ON THE EFFECTIVENESS OF WELLS CRITERIA FOR DIAGNOSING DEEP VEIN THROMBOSIS: A PROSPECTIVE OBSERVATIONAL STUDY

General Surgery

Dr. A. Kishore Babu

MS, Professor, Department of General surgery, Siddhartha Medical College, Vijayawada.

Dr. Meghavathu Govindu Naik

MS, Associate Professor, Department of General surgery, Siddhartha Medical College, Vijayawada.

Dr. Devendra G.*

Post Graduate, Department of General surgery, Siddhartha Medical College, Vijayawada.
*Corresponding Author

Dr. Shreyas Gadgil

Post Graduate, Department of General surgery, Siddhartha Medical College, Vijayawada.

ABSTRACT

Background: The Wells score, which considers a number of factors from the patient's medical history as well as a number of clinical indicators, can assist a clinician in making a diagnosis of deep vein thrombosis (DVT). This reduces the amount of time and money wasted on pointless investigations. The purpose of the study was to evaluate how well we could identify DVT and test the Wells score's applicability in our clinical setting. **Methods:** Using ultrasound (USG) as the gold standard for comparison, this prospective diagnostic validation study of the Wells rule for DVT was carried out in our setup during a 12-month period. Each patient's Wells score was calculated, and the findings were assessed. **Results:** Among the 50 cases in which DVT was suspected, the wells score was able to predict DVT in 46 instances, demonstrating its high efficiency as a diagnostic sign. The diverse cases had an average wells score of 4/8. Two incidences of cerebral vein thrombosis in the post-partum interval were observed in the study group as complications; both patients recovered completely. The study group's mortality rate was 3%, with one patient of diagnosed myocardial infarction passing away from heart failure. **Conclusions:** The Wells score is a very accurate predictor of DVT and is simple to use because it only requires a clinical evaluation. This prevents needless waiting for scans and enables us to begin anticoagulants as soon as feasible.

KEYWORDS

DVT, Mortality, Thrombosis, Wells score

INTRODUCTION

The condition phlebothrombosis doesn't cause symptoms until complications like pulmonary embolism become prominent. It was thought that a number of factors affected how well blood returned from the extremities' veins. Phlebothrombosis may develop when any one of these factors—or a combination of them—triggers enough stasis. Deep vein thrombosis is clinically asymptomatic and only shows up as its consequences. Early management of the venous phlebothrombosis process, its pathophysiology, and the availability of Doppler study have significantly decreased the incidence of pulmonary emboli and its consequences.¹

All things considered, however, man is nonetheless careless and disregards the numerous amazing tasks that our veins perform until they begin to malfunction. Deep vein thrombosis (DVT), a disorder with severe morbidity and mortality, is avoidable. According to statistics, DVT complications cause more fatalities than breast cancer and AIDS put together.² Initiation of prophylaxis against DVT with low molecular weight heparin (LMWH) is now contraindicated in cases of cerebral hemorrhage, internal bleeding from open wounds and surgical sites, spinal bleeding after spinal anesthesia, and spinal damage caused by hematoma. The patient's suffering from DVT is substantially worse following surgery or while they are in the hospital. Due to the patient's extended hospital stay and the waste of valuable hospital resources and staff, costs for the patient significantly increase.³

Starting empirical therapy with anticoagulants is dangerous since the clinical diagnosis of DVT is problematic and may mimic other illnesses as well. In remote hospitals, advanced imaging services like Doppler venous ultrasound might not always be accessible. When the diagnosis is delayed, the therapy is also delayed, losing valuable time.

Clinical evaluation using Homan's and Mose's indicators has frequently resulted in false positives, and evaluation based solely on these clinical symptoms may not be sufficient. The development of a clinical scoring system had the following objectives: to evaluate the effectiveness of the Wells criteria for diagnosing deep vein thrombosis; to highlight the associated co-morbid conditions; and to identify the most significant condition with the highest propensity to cause DVT.

The Wells Rule for DVT was the subject of this prospective diagnostic validation study, with ultrasonography (USG) serving as the gold

standard for comparison. It was carried out for a year at the Government Siddhartha Medical College in vijayawada, Department of General Surgery (January 2022 to December 2022). Score for each patient will be calculated based on the parameters given as.⁵

Table 1: Wells Clinical Prediction Rule For Deep Venous Thrombosis (dvt).

Clinical feature	Points
Active cancer (treatment within 6 months, or palliation)	1
Paralysis, paresis, or immobilization of lower extremity	1
Bedridden for more than 3 days because of surgery (within 4 weeks)	1
Localized tenderness along distribution of deep veins	1
Entire leg swollen	1
Unilateral calf swelling of greater than 3 cm (below tibial tuberosity)	1
Unilateral pitting edema	1
Collateral superficial veins	1
Alternative diagnosis as likely as or more likely than DVT	-2
Total points	

Risk Score Interpretation (probability Of Dvt)/=3 Points: High Risk (75%); 1 To 2 Points: Moderate Risk (17%); 1 Point: Low Risk (3%)

Case Study

The sample size was 50 individuals who were admitted with a clinical diagnosis of DVT. Patients who were older than 18 years old, had symptoms start within a week, and gave their consent were included in this study. Patients with bleeding disorders and recurrent DVT were not included in this study.

On arrival, all patients with suspected DVT were given a Wells score, and the diagnosis was then confirmed by venous Doppler USG. It was examined whether the Wells score and Doppler were correlated. Basic blood tests were performed. Patient safety was prioritized at every stage of the trial. Strict aseptic measures were used during every treatment, and only necessary investigations would be done after a thorough evaluation of the patient.

All procedures were carried out solely with the patient's or the attendant's consent. The main goal of this study was to evaluate the

Wells criteria's performance as a DVT diagnostic tool. By using the Wells score application, the practitioner may start treating the patient more quickly and be ready for the diagnosis even before a venous doppler USG could confirm it.

RESULTS

Fifty patients admitted with a diagnosis of deep vein thrombosis in various departments was studied prospectively between January 2021 and December 2021. The Wells score was applied on a total of 50 cases. Out of the total number of cases it was able to diagnose DVT in 92% of the cases i.e. 46 out of 50 cases. Thus proving to be a very accurate indicator for DVT. (figure 1)

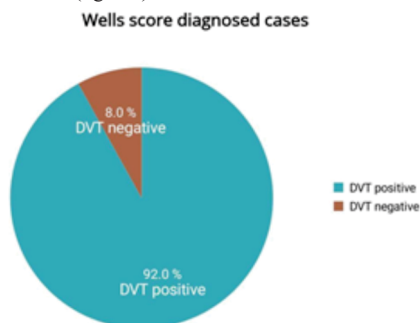


Figure 1: Wells score diagnosed cases.

Wells Score False Positive:

On analyzing the Wells score negative cases two of the cases were symptomatic due to acute lymphedema in elderly woman suffering from intra-abdominal malignancy and the other two cases were early onset cellulitis.

Wells Score Distribution:

The majority of DVT cases had a Wells score of 4/8 or higher, which suggests a 75% chance of developing deep venous thrombosis. The Wells score for 29 of the cases was 4/8. The next 10 cases, with a score of 3/8, were similarly in the same risk category. Two of the six instances with the highest score of 5/8, which were also in the category with the highest risk, did not have DVT but did have lymphedema. The remaining 2 instances had the lowest score (2/8), placing them in the intermediate risk category for developing DVT, which had a 17% risk.

Blood Group Distribution In DVT cases:

After examining how the blood types are distributed throughout the whole case list of DVT confirmed cases Blood type A was positive in 22 of the 46 confirmed instances of DVT, or 47.82% of the cases. Next there were 19 cases, or 41.30% of the cases, with blood type B positivity, followed by 3 cases, or 6.52%, with blood group AB positivity, and then 2 cases, or 4.34% of the cases, with blood group O positivity. This supports numerous studies that indicate people with blood group A had a higher incidence of deep vein thrombosis.

Sex Distribution of DVT cases:

Due to the high incidence of DVT in postpartum females, it is clear from the sex distribution of DVT cases at our hospital that the number of DVT cases is significantly higher in women. There is roughly twice as many men as women who have DVT. 46 people were afflicted, with 29 of them being female, or 63% of the total.

DVT in LSCS vs normal delivery:

There was a higher proportion of cases of DVT in females who underwent caesarean section when compared to those who underwent normal delivery. This is understandably due to the prolonged period of immobilization and pregnancy itself which is a prothrombotic state. Out of the total of 6 pregnant females with DVT 4 had undergone caesarean section and 2 underwent normal delivery.

Age Distribution Of Cases:

The average age of male patients with DVT was 42 years whereas in case of pregnant females it was 27 years and non pregnant females it was 57 years

DVT in post op cases:

90% of the total number of post-operative DVT cases were related to caesarean sections, with orthopedics coming in second. DVT was not documented in any post-operative instances in general surgery. This

may be related to the post-operative wards' recommendations for passive flexion exercises and early mobilization of the patients.

DISCUSSION:

The disorder known as DVT can develop anywhere in the venous circulation. Most DVT cases are known to happen in the deep leg veins, then in the pelvis. Two of the postpartum cases in our study showed evidence of deep vein thrombosis, which occasionally also develops in the cerebral venous sinuses.

The Venous Doppler USG determined that 46 of the 50 cases, out of which the Wells score was used, had DVT. In a ratio of 1.7:1, there were more female cases among the confirmed DVT cases. A total of 63.04% of the patients were female, and the remaining 36.96 were male. This is quite consistent with a study conducted in New Zealand by Maelen Tagelagi and colleagues, where 62% of the participants were female.¹

The Wells Score, however, did not appear to be as helpful in the New Zealand study's setup as it was in our investigation, which had a high predictive rate of 46 out of 50 probable cases. 5 Two of the false-positive instances had radiotherapy-treated cervical cancer, while the other two involved cellulitis with early onset. There are several recognized processes by which lymphedema in cancer develops.

The main cause of the condition is well-known to be extensive lymph node dissection after surgery. After cancer surgery, radiation also results in lymph node and lymph vessel scarring. Moreover, lymph vessels are known to be blocked by tumor emboli. Any malignancy is a risk factor for spontaneous DVT, according to research by Ruud Oudega and colleagues.

Due to the blockage of protein-rich lymphatic fluid, which serves as an ideal environment for bacteria to thrive and create a vicious cycle, lymphedema also appears in cases of cellulitis. A Wells score of 4 out of 8 indicates a 75% or higher likelihood of developing DVT, and according to a review of the average Wells score seen in the DVT positive cases, 29 of the 46 cases had this score. 1 In our study group, the average age of the men who had DVT was 42 years old, while the average age of the pregnant women was 27, with the majority of these women being post-menopausal cancer patients. Compared to non-pregnant women, pregnant women have a five times greater risk of developing DVT.³⁻⁵

Once more, this is consistent with the data provided by the National Heart, Lung, and Blood Institute and the US Office of the Surgeon General (US). 7 Furthermore observed was that people with non-O blood types had a greater risk of DVT. The majority of DVT cases in our study had positive blood group results, which suggested a higher plasma level of Von Willebrand factor, probably a mutant form. This was consistent with research by Mike Makris and Massimo Franchini.^{4,8} The largest incidence of DVT among cases that had occurred in the post-operative period was following a caesarean section, followed by orthopedics in cases of polytrauma.

In our study group, there were no DVT cases in the post-operative general surgery ward. The early mobilization of patients in post-operative wards and the promotion of passive flexion exercises may have contributed to this. Also, there is evidence in the literature, as stated by Victor, that smoking induces a procoagulant state through a variety of mechanisms, including increased platelet activation, decreased fibrinolysis, and others, making it a very high risk factor for DVT.

CONCLUSION:

This study came to the conclusion that the Wells score is a very good predictor of deep vein thrombosis and can be applied easily because it just required clinical assessment. This reduces needless wait times for scans and enables us to begin anticoagulants as soon as feasible.

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