



Advancements in VTE Risk Assessment and Prevention in Cancer Care

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DESCRIPTION

Venous Thromboembolism (VTE), encompassing both Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE), is a significant complication in patients with solid malignancies. These patients are at a higher risk for developing VTE due to various factors, including the pro-thrombotic effects of cancer itself, chemotherapy and immobility [1]. In ambulatory patients with solid malignancies, identifying those at elevated risk for Cancer-Associated VTE (CAVTE) is important for implementing appropriate preventive measures to reduce the occurrence of these potentially fatal events [2].

The pathophysiology of CAVTE involves a complex exchange of cancer-related factors, such as the hypercoagulable state induced by tumor-derived procoagulant factors and the effects of chemotherapy and other treatments [3,4]. Tumors release procoagulant substances, including tissue factor and cancer procoagulant, which activate the coagulation cascade. Additionally, the treatment regimens for solid malignancies, such as chemotherapy and hormonal therapy, can further exacerbate this prothrombotic environment. Chemotherapy agents such as cisplatin, cyclophosphamide and doxorubicin are known to impair the fibrinolytic system and increase the risk of thrombosis. Moreover, certain malignancies, such as pancreatic, lung and gastrointestinal cancers, are particularly associated with a high incidence of VTE [5].

Risk stratification tools have been developed to assist clinicians in identifying patients at higher risk for VTE. One widely used tool is the Khorana score, which incorporates factors such as cancer type, platelet count, hemoglobin levels, leukocyte count and Body Mass Index (BMI) [6,7]. The Khorana score has been validated in multiple studies and is effective in identifying patients with solid malignancies who are at an increased risk for developing VTE. Other risk factors, including a history of VTE, age and the presence of comorbid conditions like obesity or immobility, further contribute to the assessment of individual VTE risk in cancer patients.

In ambulatory patients, VTE prevention strategies must balance the benefits of thromboprophylaxis against the risks of bleeding, especially since many of these patients are not hospitalized and may have a lower overall risk for VTE compared to inpatients. The decision to initiate thromboprophylaxis should be guided by the risk assessment score and individualized based on the patient's clinical scenario. For those identified as high-risk, the use of pharmacologic prophylaxis with Low-Molecular-Weight Heparin (LMWH), fondaparinux, or Direct Oral Anticoagulants (DOACs) is recommended in many guidelines. LMWH has been widely studied and remains a standard of care, particularly in patients with active cancer. DOACs, such as rivaroxaban and apixaban, have shown promise in recent trials and are gaining acceptance due to their convenience and favorable safety profile compared to LMWH [8,9].

However, the use of thromboprophylaxis in ambulatory patients is not without challenges. The potential for adverse events, such as bleeding or interactions with other medications, must be considered. This is particularly important in patients receiving chemotherapy, as drug interactions and liver or renal dysfunction can alter anticoagulant metabolism. Close monitoring and patient education are significant components of managing thromboprophylaxis in this population. Furthermore, while pharmacologic methods are effective, non-pharmacologic interventions such as compression stockings and the promotion of physical activity may also help reduce the risk of VTE.

Recent studies have suggested that the implementation of individualized risk assessment protocols, followed by tailored preventive strategies, can significantly reduce the incidence of VTE in ambulatory cancer patients. These strategies should be continuously refined, taking into account the evolving landscape of cancer treatment and the increasing availability of newer anticoagulants with fewer side effects. Ultimately, the goal is to strike a balance between preventing thromboembolic events and minimizing bleeding risks, ensuring the optimal management of cancer patients who are at risk for VTE [10].

In conclusion, cancer-associated VTE remains a prevalent and potentially life-threatening complication in ambulatory patients

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with solid malignancies. Early identification of patients at high risk through validated risk scores such as the Khorana score is essential for implementing effective preventive strategies. Pharmacologic prophylaxis with LMWH or DOACs, combined with non-pharmacologic measures, can significantly reduce the incidence of VTE in this population. Ongoing research is essential to refine risk assessment tools and preventive strategies, ensuring that cancer patients receive the most appropriate care to reduce the burden of VTE.

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