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Acute or Chronic Venous Thromboembolism: Therapeutic Anticoagulation and its Management Implications

Bell Anderison^{*}

Department of Cardiology, University of Aarhus, Aarhus, Denmark

DESCRIPTION

Venous Thromboembolism (VTE) is a common and potentially life-threatening condition characterized by the formation of blood clots in the deep veins of the legs or pelvis, known as Deep Vein Thrombosis (DVT), and their subsequent migration to the lungs, known as Pulmonary Embolism (PE). While VTE can occur as an acute event, there are cases where it presents as an acute on chronic condition, referred to as acute on chronic venous thromboembolism. Acute or chronic VTE refers to the occurrence of acute thromboembolic events in patients with preexisting chronic venous thromboembolic disease. It represents a challenging situation in clinical practice due to the increased complexity and potential complications associated with this condition. Chronic VTE is characterized by the persistence of residual thrombus in the venous system after an initial episode of acute VTE. Factors contributing to chronicity include impaired fibrinolysis, venous obstruction, and underlying venous insufficiency. Acute on chronic VTE can arise due to various triggers, such as surgical procedures, immobilization, or other prothrombotic states, leading to the destabilization of chronic thrombi and the occurrence of acute events.

Therapeutic anticoagulation for acute or chronic venous thromboembolism

The cornerstone of managing acute or chronic VTE is therapeutic anticoagulation. The goal is to prevent further clot propagation, minimize the risk of embolization, and reduce the incidence of long-term complications. Anticoagulation can be achieved through various pharmacological agents, including Unfractionated Heparin (UFH), Low Molecular Weight Heparin (LMWH), and Direct Oral Anticoagulants (DOACs).

Unfractionated Heparin (UFH): UFH is a parenteral anticoagulant that exerts its effect by binding to antithrombin III and enhancing its inhibitory activity against thrombin and factor Xa. It is administered intravenously or subcutaneously and

requires monitoring of Activated Partial Thromboplastin Time (aPTT). UFH is often used in the initial phase of acute on chronic VTE management due to its rapid onset of action and reversibility. However, its use is associated with a higher risk of bleeding and requires close monitoring.

Low Molecular Weight Heparin (LMWH): LMWH, including enoxaparin and dalteparin, is a subcutaneously administered anticoagulant that exhibits enhanced bioavailability and longer half-life compared to UFH. LMWH selectively inhibits factor Xa, thereby interfering with the clotting cascade. It offers several advantages over UFH, including predictable anticoagulant response, reduced risk of heparin-induced thrombocytopenia, and no need for routine monitoring. LMWH is commonly used for the initial and long-term treatment of acute on chronic VTE, particularly in the outpatient setting.

Direct Oral Anticoagulants (DOACs): DOACs, such as rivaroxaban, apixaban, edoxaban, and dabigatran, are oral anticoagulants that directly target specific clotting factors, either thrombin (factor IIa) or factor Xa. They offer several advantages over traditional anticoagulants, including fixed dosing regimens, predictable pharmacokinetics, and minimal drug interactions. DOACs have emerged as viable alternatives to LMWH and warfarin for the treatment of acute on chronic VTE, with numerous clinical trials demonstrating their efficacy and safety.

Management considerations and challenges

The management of acute or chronic VTE requires a comprehensive approach that involves risk stratification, identification of underlying triggers, and individualized anticoagulant therapy. The duration of anticoagulation depends on various factors, including the presence of reversible risk factors, the severity of symptoms, and the risk of bleeding. In patients with acute on chronic VTE who require interventions such as surgery or invasive procedures, careful coordination between anticoagulation management and the intervention is crucial to minimize bleeding and thrombotic risks.

Correspondence to: Bell Anderison, Department of Cardiology, University of Aarhus, Aarhus, Denmark, E-mail: bellandrison@gmail.com

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Challenges in managing acute or chronic VTE include the risk of bleeding, drug interactions, patient adherence, and the need for long-term anticoagulation. Bleeding complications can occur with any anticoagulant therapy, and careful assessment of the individual's bleeding risk is essential. Additionally, drug interactions can affect the pharmacokinetics and efficacy of anticoagulants, necessitating careful consideration in patients receiving multiple medications. Ensuring patient adherence to anticoagulation therapy is critical for optimizing outcomes, as nonadherence increases the risk of recurrent VTE.