



Clinical use of Drugs for Treating Thrombosis in Modern Medicine and Traditional Chinese Medicine

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DESCRIPTION

Thrombosis, the formation of blood clots within blood vessels, is a major global health concern. It can lead to severe complications, such as stroke, myocardial infarction, Deep Vein Thrombosis (DVT) and requires prompt and effective treatment. Modern Medicine (MM) has developed an array of pharmacological interventions to prevent and treat thrombosis, while Traditional Chinese Medicine (TCM) suggests complementary approaches based on centuries-old practices. Examining both perspectives highlights the potential of integrating these systems for comprehensive care.

Modern medicine: Evidence-based approaches

Modern medicine uses a well-defined pharmacological framework to manage thrombosis. Anticoagulants, antiplatelet agents and thrombolytic drugs are the fundamental of treatment.

Anticoagulants: Drugs such as heparin, warfarin and Direct Oral Anticoagulants (DOACs) like rivaroxaban and apixaban are widely used. These medications reduce blood clot formation by targeting specific factors in the coagulation cascade. For instance, DOACs inhibit Factor Xa or thrombin, suggesting a predictable therapeutic effect with minimal monitoring requirements.

Antiplatelet agents: Drugs like aspirin and clopidogrel inhibit platelet aggregation, thereby preventing arterial thrombosis. These are often prescribed for patients with coronary artery disease or following stent placement to reduce the risk of recurrent cardiovascular events.

Thrombolytics: Agents such as tissue Plasminogen Activator (tPA) dissolve existing clots, restoring blood flow in acute emergencies like ischemic stroke or pulmonary embolism. However, their use is limited by a narrow therapeutic window and a risk of bleeding complications.

Modern pharmacology indicates evidence-based practice, with rigorous clinical trials supporting the efficacy and safety of these treatments. Despite their effectiveness, challenges such as bleeding risks, drug interactions and resistance to therapy necessitate ongoing research and personalized approaches.

Traditional Chinese Medicine (TCM)

Traditional Chinese Medicine views thrombosis as a manifestation of underlying imbalances in the body's systems. It categorizes the condition under syndromes such as "blood stasis" and "Qi deficiency." Treatments aim to restore harmony by improving blood circulation, resolving stasis and strengthening the body's innate healing abilities.

Herbal medicines: TCM relies on plant-based formulations to enhance blood flow and prevent clot formation. For instance, Danshen (*Salvia miltiorrhiza*) is renowned for its ability to promote circulation and inhibit platelet aggregation. Similarly, Honghua (*Carthamus tinctorius*) and Sanqi (*Panax notoginseng*) are frequently used in decoctions to dissolve blood clots and reduce inflammation.

Acupuncture: This technique stimulates specific points on the body to regulate blood flow and reduce stasis. Research suggests that acupuncture may improve microcirculation and reduce clotting risks, although further studies are required to validate its clinical applications.

Dietary and lifestyle adjustments: TCM indicates diet and lifestyle modifications to support vascular health. Foods like garlic, ginger and turmeric are recommended for their blood-thinning properties, while stress reduction techniques, including Tai Chi and Qigong, are promoted to maintain overall health.

Unlike modern medicine, TCM approaches thrombosis through individualized treatments, considering each patient's constitution and symptoms. However, the lack of large-scale clinical trials and standardization of TCM formulations presents challenges in establishing universal guidelines.

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Association of integrative care

There is growing interest in combining modern medicine and TCM to optimize thrombosis management. Both systems offer distinct advantages: MM provides rapid, targeted interventions, while TCM offers long-term support and fewer side effects.

Adjunctive use of TCM: Studies suggest that certain TCM herbs may enhance the efficacy of anticoagulants and reduce their side effects. For instance, Danshen has been found to complement warfarin therapy by improving microcirculation and reducing inflammation, though careful monitoring is required to avoid bleeding risks.

Reducing side effects: Integrating TCM may help mitigate adverse effects of modern drugs. Herbs like Sanqi may reduce gastrointestinal irritation caused by aspirin, while TCM-based tonics can address fatigue and other side effects associated with anticoagulants.

Total patient care: TCM's identifies on lifestyle, diet and emotional well-being aligns with modern preventive strategies. Incorporating mindfulness practices and anti-inflammatory diets into conventional care can improve patient outcomes and quality of life.

While integration holds potential, it also requires rigorous research to ensure safety and efficacy. Pharmacokinetic interactions between TCM herbs and modern drugs must be

carefully studied to avoid complications. Collaborative efforts between TCM practitioners and medical professionals are essential to develop evidence-based integrative protocols.

Challenges and future directions

Despite their strengths, both systems face limitations. Modern medicine's reliance on pharmacological interventions can result in side effects and high costs, while TCM's lack of standardization and limited empirical evidence hinder its widespread adoption. Bridging these gaps requires a multidisciplinary approach, combining clinical trials, pharmacological research and patient-centered care.

Emerging fields such as systems biology and precision medicine offer opportunities to integrate TCM's holistic principles with modern scientific insights. For instance, understanding the molecular mechanisms of TCM herbs can lead to novel drug discoveries, while TCM concepts of personalized care can inform modern approaches to treatment customization.

The clinical management of thrombosis benefits from the strengths of both modern medicine and Traditional Chinese Medicine. While MM provides immediate and evidence-based interventions, TCM offers complementary therapies that enhance long-term outcomes. By harmonizing these approaches, healthcare providers can offer more comprehensive, effective and personalized care for patients with thrombosis.