Is low-molecular-weight heparin superior to aspirin for VTE prophylaxis?

Aspirin demonstrated a significantly higher rate of postoperative venous thromboembolic events compared with enoxaparin in this noninferiority study.

**PRACTICE CHANGER**

Consider low-molecular-weight heparin (LMWH) rather than aspirin to prevent postoperative venous thromboembolism (VTE) in patients undergoing total hip or knee arthroplasty for osteoarthritis.

**STRENGTH OF RECOMMENDATION**

**B:** Based on a single cluster-randomized crossover trial.¹


**ILLUSTRATIVE CASE**

A 72-year-old man with well-controlled hypertension and chronic obstructive pulmonary disease is scheduled for right total hip arthroplasty (THA) due to severe arthritis. He will be admitted to the hospital overnight, and his orthopedic surgeon anticipates 2 to 3 days of inpatient recovery time. In addition to medical management of the patient’s comorbid conditions, the surgeon asks if you have any insight regarding VTE prophylaxis for this patient. Specifically, do you think aspirin is equal to LMWH for VTE prophylaxis?

All adults undergoing major orthopedic surgery are considered to be at high risk for postoperative VTE development, with those having lower-limb procedures at highest risk.² Of the more than 2.2 million THAs and total knee arthroplasties (TKAs) performed in the United States between 2012 and 2020, 55% were primary TKAs and 39% primary THAs.³ The American College of Chest Physicians (ACCP) estimated a baseline 35-day risk for VTE of 4.3% in patients undergoing major orthopedic surgery.⁴ The highest VTE risk occurs during the first 7 to 14 days post surgery (1.8% for symptomatic deep vein thrombosis [DVT] and 1% for pulmonary embolism [PE]), with a slightly lower risk during the subsequent 15 to 35 days (1% for symptomatic DVT and 0.5% for PE).⁴

Aspirin’s low cost, availability, and ease of administration make it an attractive choice for VTE prevention in patients post THA and TKA surgery. The Pulmonary Embolism Prevention (PEP) trial evaluated 13,356 patients undergoing hip fracture repair and 4088 patients undergoing arthroplasty and found aspirin to be safe and effective in prevention of VTEs compared with placebo. The investigators concluded that “there is now good evidence for considering aspirin routinely in a wide range of surgical and medical groups at high risk of venous thromboembolism.”⁵ The PEP study, along with others, led to the emergence of aspirin monotherapy for VTE prophylaxis.

Current guidelines for perioperative VTE prophylaxis are based on American Society of...
Although this study was designed as a noninferiority trial, analysis showed enoxaparin to be significantly superior to aspirin for postoperative VTE prophylaxis.
a 100-mg aspirin formulation, which is not available in the United States.

**CHALLENGES TO IMPLEMENTATION**

**Aspirin is far cheaper and administered orally**

Aspirin is significantly cheaper than enoxaparin, costing about $0.13 per dose (~$4 for 30 tablets at the 81-mg dose) vs roughly $9 per 40 mg/0.4 mL dose for enoxaparin.9 However, a cost-effectiveness analysis may be useful to determine (for example) whether the higher cost of enoxaparin may be offset by fewer DVTs and other sequelae. Lastly, LMWH is an injection, which some patients may refuse.

References


