2018

Examination of Venous Thromboembolism Prophylaxis in Patients Undergoing Total Knee Arthroplasty

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Recommended Citation
Kucera, William, "Examination of Venous Thromboembolism Prophylaxis in Patients Undergoing Total Knee Arthroplasty" (2018). Physician Assistant Scholarly Project Posters. 16.
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Elective total knee arthroplasty (TKA) is the most frequently performed procedure (8), 1056. The authors concluded factor Xa inhibitors were associated with the lowest incidence of DVT and PE, collectively referred to as VTE prophylaxis, in patients undergoing TKAs. Pharmacology of medications included in this literature review were obtained from various, up to date, credible sources and research articles. Studies were included if the patient population underwent a TKA, received prophylaxis, and did not have a history of valve repair or preexisting condition requiring prior anticoagulation therapy. Studies also had to be from within the last 10 years. Study participants were all adults undergoing TKA.

In a systematic review, Vincent, V. G., Phan, K., Yadlin, L., & Warsick, B. (2009) examined the efficacy of aspirin in preventing VTE in patients undergoing THA or TKA. The overall rates of DVT and PE in the THA and TKA populations were 1.2% and 0.6%, respectively. The rate of major bleeding was 0.3%, and the pooled mortality rate was 0.2%. The researchers concluded that aspirin use both alone and in combination for thromboprophylaxis resulted in a low rate of VTE and major bleeding complications.

Wilson, Poole, Chan, & Rogers (2016) performed a systematic review of 13 total studies investigating the efficacy of aspirin for DVT prophylaxis compared to warfarin, enoxaparin, factor Xa inhibitors, and direct thrombin inhibitors following THA and TKA.

Wilson et al. (2016) concluded that insufficient evidence existed to establish one medication as superior and that each had a unique side effect profile to be considered on a case by case basis.

Vincent et al. (2009) performed a systematic review to determine the efficacy of aspirin in preventing VTE in patients undergoing a TKA or THA. The study did not include that aspirin used both alone and in combination for thromboprophylaxis resulted in a low rate of VTE and major bleeding complications.

Researchers utilized a decision model to describe and understand the following sub-modules including the patient's anticoagulant: post-thromboprophylaxis, long-term complications.

The researchers found that rivaroxaban was associated with a cost saving of $464.57 per patient and prevented an average of 0.0193 symptomatic VTE events per patient. Sensitivity analysis demonstrated a cost savings ranging from $293.01 to $488.68.

Mostafavi et al. (2015) examined the cost effectiveness of aspirin compared to warfarin in TKAs. The researchers used a Markov cohort cost effectiveness analysis that compared the costs, health benefits, and the costs per quality adjusted life year (QALY) for patients 55 to 85 years of age. The results of their analysis revealed aspirin was more cost effective than warfarin in the majority of patients undergoing TKAs.

In patients with a high probability of VTE and a low probability of bleeding, however, warfarin was more cost effective.

Multiple medications are both safe and effective in the prevention of VTE events in patients undergoing TKA. In the past, warfarin was the most commonly utilized prophylactic agent, and it continues to be the agent of choice in patients who have previously undergone heart valve repair. However, in the face of multiple potential drug interactions, frequent required laboratory monitoring of the INR, and difficulty maintaining a therapeutic INR, warfarin is being used far less frequently. Clinicians have begun favoring aspirin and factor Xa inhibitors, and both of these agents have been endorsed by the AAOS and AACP as sole options for management of VTE prophylaxis in patients undergoing TKAs.

Studies, as discussed above, have demonstrated the superiority of aspirin and factor Xa inhibitors over LMWH and warfarin in terms of efficacy of DVT prevention. Factor Xa inhibitors are cost effective and demonstrate an increased bleeding risk compared to aspirin. Neither drug requires laboratory monitoring, and once daily and twice daily dosing options are available for both drugs.

After extensive review of the literature, this author’s opinion is that, in low risk patients undergoing TKA, aspirin is a safe and effective pharmacological agent. Aspirin has a limited risk profile, is cost effective and available over the counter, and does not require laboratory monitoring. The dosing regimen is simple and consists of one 81 mg tablet twice daily for six weeks postoperatively. Further, in the case of overdose, a reversal agent is available. Clinicians must be prudent in analyzing each patient’s DVT risk preoperatively so as to choose the most superior prophylactic agent based on the patient’s history and anticipated period of immobilization.

References


Cafri et al., 2017. Various pharmacological agents exist for the purpose of VTE prophylaxis. Thrombin inhibitors (DTIs), warfarin is used far less frequently. Aspirin is now approved for VTE prophylaxis. The purpose of this study was to determine if a superior drug or combination exists for VTE prophylaxis based on patient outcomes, cost effectiveness, and risk profile. This review of literature and studies will be the past 10 years. Compared aspirin, warfarin, Levenon, and the novel anticoagulants for VTE prophylaxis in post-operative TKAs. Studies outcomes included VTE prophylaxis, bleeding risk, and cost. Reverse all were examined. Findings of this literature review demonstrated that currently, no one superior medication exists for prophylaxis of VTE events in patients undergoing TKA (Cali et al., 2017).

However, current research indicates that both factor Xa inhibitors and aspirin have emerged as the medications of choice. Of the two, aspirin is favored as it does not require a laboratory monitoring, is cost effective, and is available over the counter. It also has less risk of major bleeding compared to factor Xa inhibitors.

The authors concluded factor Xa inhibitors were associated with the lowest incidence of DVT and PE, collectively referred to as VTE prophylaxis, in patients undergoing TKAs. Various pharmacological agents exist for VTE prophylaxis. Warfarin and low-molecular-weight heparins (LMWH) were commonly used for VTE prophylaxis in the past, but with the emergence of novel anticoagulants including factor Xa inhibitors and direct thrombin inhibitors (DTIs), warfarin is used far less frequently. Aspirin is also approved for VTE prophylaxis. The purpose of this study was to determine if a superior drug or combination exists for VTE prophylaxis based on patient outcomes, cost effectiveness, and risk profile. This review of literature and studies will be the past 10 years. Compared aspirin, warfarin, Levenon, and the novel anticoagulants for VTE prophylaxis in post-operative TKAs. Studies outcomes included VTE prophylaxis, bleeding risk, and cost. Reverse all were examined. Findings of this author’s literature review demonstrated that currently, no one superior medication exists for prophylaxis of VTE events in patients undergoing TKA (Cali et al., 2017).

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Introduction

Elective total knee arthroplasty (TKA) is the most frequently performed inpatient surgical procedure in the United States, with an estimated 700,000 TKA’s performed in 2010 and a projected 3.48 million procedures per year by 2020 (Kantar, G., Lai, Mou, & Haber, 2007). With well-known complications of this procedure include DVT and PE, collectively referred to as VTE. Various pharmacological agents exist for VTE prophylaxis. Warfarin and low-molecular-weight heparins (LMWH) were commonly used for VTE prophylaxis in the past, but with the emergence of novel anticoagulants including factor Xa inhibitors and direct thrombin inhibitors (DTIs), warfarin is used far less frequently. Aspirin is also approved for VTE prophylaxis. The purpose of this study was to determine if a superior drug or combination exists for VTE prophylaxis based on patient outcomes, cost effectiveness, and risk profile.

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