CAT

Thromboprophylaxis for Post Operative TKR

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Clinical Scenario: B.T. is a 72 year old male who underwent a total knee replacement 12 hours ago. He will spend 72 hours as a hospital inpatient and be discharged to his home on thromboprophylaxis.

Clinical Question:

Does thromboprophylaxis in post operative total knee replacement and total hip replacement patients decrease incidence of DVT and decrease short term mortality rate?

Article:

Rahme, Elham PhD. Et.al. (2008) Postdischarge thromboprophylaxis and mortality risk after hip or knee replacement surgery. *Canadian Medical Journal Association,* 178 (12) Retrieved from http://mdconsult.com/das/article/body/178485025/jorg=journal&source=MI

Schiff, Renee MD.et.al. (2005) Identifying Orthopedic Patients at High Risk for Venous Thromboembolism Despite Thromboprophylaxis. *Chest* 125 (5) Retrieved from: http://www.mdconsult.com/das/article/body/178485025/jorg=journal&source=MI

Summary of Key Points

I. What are the Results?

The first of the two reviewed studies was conducted by Renee Schiff. It concluded that despite standard thromboprophylaxis, symptomatic breakthrough of venous thromboembolism developed in 14% of patients that underwent the described surgery (total knee, total hip and hip fracture surgery).This study found that patients undergoing total knee arthroplasty were more likely to develop a DVT, thus TKR surgery may warrant a more aggressive treatment of thromboprophylaxis (Schiff et. Al, 2005).

The second study conducted by Elham Rahme found that patients undergoing total hip arthroplasty may be more likely to develop DVT. This is in contrast to the above study. The results of this study found patient were less likely to receive home treatment for thomboprophylaxis in they had a longer hospital stay and of these patient a total 223 patients died in the 3 month period after discharge related to

venous thromboembolism. Thus finding that the risk of short term mortality was lower among those who received thromboprophylaxis after discharge (Rahme et al.2008).

II. Are the Results valid?

The research in both studies was retrospective in nature. Each study involved charts from consecutive patients who underwent total hip replacement, total knee replacement or hip fracture surgery . Data was collected on basis of patient characteristics, surgical characteristics and thromboprophylaxis regimen. The documentation was thorough including the site and side of surgery completed, operative factors such as elective or urgent surgery, length of surgery and type of anesthesia used, and venous thromboembolism risk such as previous thrombosis, malignancy, active medical conditions and use of estrogenic compounds in both studies conducted. The definition of bleeding was very clearly defined in both studies and patients that presented with complication during surgery were discarded from the study. The type, dose and duration of low molecular weight heparin that was used for prophylaxis was clearly recorded. Also all hospital admissions and emergency room visits to this hospital were reviewed for over 1 year to screen for patients in the study who may have presented with complication of venous thromboembolism. This would assure that all results were captured to accurately analyze (Schiff et. Al, 2005) (Rahme et al.2008).

The study was conducted to monitor two periods of time in the postoperative setting. One period was a time when enoxaparin 30 mg subcutaneous BID for 7 days was used for thromboprophylaxis in all total hip, total knee, and hip fractures. Another period for which dalteparin 5,000 units subcutaneous every day was given. The results showed that there was a higher incidence of venous thromboembolism in patient who received the dalteparin than in patients receiving enoxaparin.

One weakness apparent to the study may include a high rate of geriatric patients. Other studies completed similar to this did report a lower incidence of venous thromboembolism and age may have been a factor. Also, this study as compared to the second, found that patients having total knee replacement were more likely to have an emboli. I believe the level of evidence for this study would be B, it is a retrospective study with <80% followup, 2b (Schiff et. Al, 2005).

In the second study reviewed, a retrospective study was also done. In this study, a larger number of patients were reviewed. 10,744 patients were reviewed, all having total hip and knee replacements. The mean age of patient in this study is 75.4, this may also be a weakness the this study as it may not be a clear picture for a younger patient. It does however, have a larger patient population of study. With this large number of participants the results may be more complimentary of the general population. The level of evidence for this study would also be B as it too is a retrospective case, however the follow-up was much more thorough with the large participant numbers, 2a (Rahme et al.2008).

III. Clinical Bottomline

Venous thromboembolism is the leading cause of mortality among patients in the hospital. Total hip and knee replacements are associated with a high risk for postoperative venous thromboembolism (Rahme et al.2008). Patients undergoing orthopedic surgery are an extremely high-risk population. For hip fracture, total hip replacement, and total knee replacement, low molecular weight heparin (LMWH), fondaparinux, or warfarin is currently the first line treatment as prophylaxis. Warfarin should can be started (5-10 mg orally daily) the night before surgery or on the night of the surgery. Consider starting older and debilitated patients on a lower dose. Dose should be adjusted to reach target INR of 2.5 (First Line Therapy, 2010).

Minimum duration of thromboprophylaxis is 10 days. Extended prophylaxis up to 35 days is strongly recommended for total hip replacement and hip fracture surgery. The recommendation is much weaker for total knee replacement. If surgery for hip fracture is delayed, LMWH or unfractionated heparin (UFH) should be given before surgery (First Line Therapy, 2010).

In obese patients (BMI >30 kg/m^2), weight-based prophylactic LMWH dosing is preferable to fixed dosing. Dose can be adjusted empirically for patients <50 kg who are at risk of bleeding, but guidelines do not address this issue (First Line Therapy, 2010).

LMWH are eliminated through the kidney and must be used with caution in patients with chronic renal failure. UFH can be used instead, or a reduced dose of LMWH can be used according to the manufacturer's instructions (available for enoxaparin), or anti-Xa levels can be measured. Fondaparinux should not be used in patients with renal insufficiency (First Line Therapy, 2010).

Considering the results of both appraised studies, I believe the current first line treatment is appropriate. The study done by Rahme had a large number of patients and results showed the elderly patients that were prescribed LMWH as inpatients and were followed with warfarin for 28 days to six weeks had a lower risk of short term mortality. I believe the current treatment guidelines states that Warfarin should be used for at least 10 days. Based on the research presented, I may alter my practice to prescribe some type of thromboprophylaxis to extend through the suggested 28 day-6week period. Especially in high risk populations, elderly, chronically ill or obese patients this could be more vital.

Additional Reference:

First Line Therapy for Post Surgical thromboprophylaxis, 2010. Epocrates Online. Retrieved from: https://online.epocrates.com/noFrame/showPage.do?method=diseases&MonographId=1087&ActiveSectionId=42