Evaluation of Aspirin Monotherapy for Prevention of Venous Thromboembolism After Elective Total Hip and Knee Arthroplasty

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Background

- The estimated incidence of venous thromboembolism (VTE) in the first 35 days after total hip (THA) and total knee arthroplasty (TKA) is 4.3%[1]
- VTEstimator ©MedAp LLC is a validated mobile application that can be used to assess the risk of VTE in patients undergoing THA and TKA[2]
- Practice guidelines recommend pharmacological and/or mechanical VTE prophylaxis after surgery
  - The American Academy of Orthopaedic Surgeons (AAOS) does not make specific recommendations[3], while the American College of Chest Physicians (ACCP) prefers low molecular weight heparin (LMWH)[1]
- Aspirin is an attractive option for VTE prophylaxis due to concerns with cost, adherence, and wound complications with alternative agents
- Randomized controlled trials suggest aspirin may be effective for VTE prophylaxis when used after an initial prophylaxis period of 10 or 5 days with dalteparin or rivaroxaban, respectively[4,5]
- Limited data exists for aspirin monotherapy and there is no consensus on an ideal regimen

Objectives

- **Primary:**
  - Determine rates of symptomatic VTE in patients receiving aspirin monotherapy at 35 and 90 days after THA or TKA
  - Determine rates of major and clinically relevant non-major bleeding during index hospitalization and up to 35 days
- **Secondary:**
  - Describe patient risk factors and stratify risk using VTEstimator ©MedAp LLC
  - Describe prescribed aspirin regimens for VTE prophylaxis

Methods

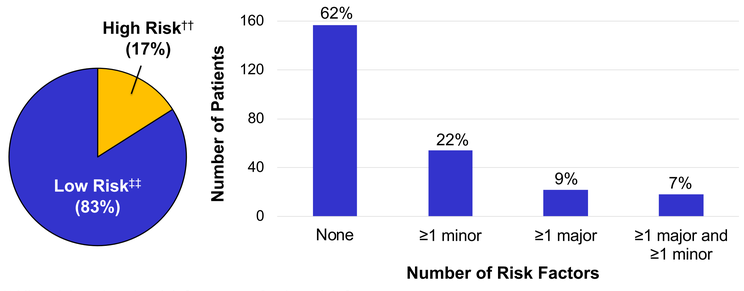
- **Design:** Retrospective cohort study, convenience sample
- **Inclusion Criteria:**
  - Age ≥ 18 years admitted to Surrey Memorial Hospital (SMH) for elective THA or TKA between February to July 2019
  - Prescribed aspirin ≥ 160 mg/day monotherapy after surgery for VTE prophylaxis
- **Exclusion Criteria:**
  - History of aspirin or NSAID allergy
  - On therapeutic anticoagulation and/or dual antiplatelet therapy
- **Definitions**
  - Major bleeding: Fatal, symptomatic and occurs in a critical area/organ, causes a fall in hemoglobin of ≥ 20 g/L over 24 hours, requires transfusion of ≥ 2 units of blood or reoperation
  - Clinically relevant non-major bleeding: Overt, did not meet major bleeding criteria, associated with new or prolonged hospitalization; includes severe epistaxis, gastrointestinal bleed confirmed by endoscopy, hematuria, wound hematoma with or without infection

Results

Table 1: Patient Characteristics (N=252)

Female, n (%)	146 (58)
Age (years), median (IQR)	68 (63-73)
BMI (kg/m^2), median (IQR)	29 (26-33)
Aspirin use prior to admission, n (%)	55 (22)
History of peptic ulcer disease, n (%)	9 (4)
Total hip arthroplasty§, n (%) Total knee arthroplasty¶, n (%)	55 (22) 197 (78)
Type of prosthesis, n (%) Cemented Non-cemented	 198 (79) 54 (21)
Anesthetic, n (%) Regional General Both	 207 (82) 27 (11) 18 (7)
American Society of Anesthesiologists (ASA) score, n (%) 1 = normal and healthy 2 = mild systemic disease 3 = severe systemic disease that is not incapacitating	 18 (7) 175 (70) 59 (23)
Time in operating room (min), median (IQR)	88 (79-103)
Postoperative mechanical compression, n (%)	0 (0)
Postoperative celecoxib use, n (%)	191 (76)
Length of stay (days), median (IQR)	3 (2-4)

§ 90% of surgeries completed by 2 surgeons ¶ 90% of surgeries completed by 3 surgeons



†† High risk: ≥ 1 major risk factor or ≥ 3 minor risk factors

‡‡ Low risk: 0 major risk factors and ≤ 2 minor risk factors

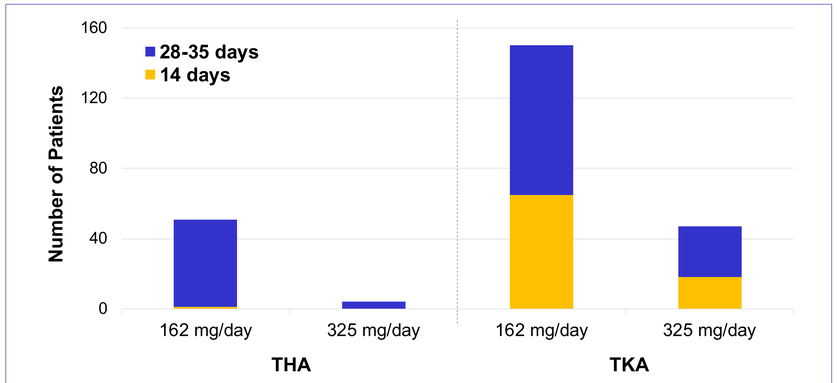
Figure 1: Risk Stratification with VTEstimator ©MedAp LLC (N=252)

Table 2: Patient Risk Factors for VTE (N=252)

Major risk factors, n (%) History of cancer History of stroke History of VTE	 25 (10) 13 (5) 2 (1)
Minor risk factors, n (%) Obstructive sleep apnea History of myocardial infarction Chronic obstructive pulmonary disease Other	 39 (16) 13 (5) 8 (3) 22 (8)

Table 3: Symptomatic VTE (N=252)

35 days after surgery, n (%)	1 (0.4)
90 days after surgery, n (%)	0 (0)



- 98% of regimens were initiated on postoperative day 1

Figure 2: Aspirin Regimens (N=252)

Table 4: Adverse Effects (N=252)

Major bleeding, n (%)	1 (0.4)
Clinically relevant non-major bleeding, n (%)	7 (2.8)

Limitations

- Single centre, retrospective design, small sample size
- VTE risk assessment not documented or standardized among prescribers
- Aspirin VTE prophylaxis regimen and duration varied among prescribers
- Unknown adherence to prescribed aspirin regimens after discharge
- Unable to capture VTE and/or bleeding events for patients seen outside of Fraser Health Authority (FHA) after discharge

Conclusions

- The study population experienced a VTE rate of 0.4% and an overall bleeding rate of 3.2% on aspirin monotherapy for VTE prophylaxis initiated on postoperative day 1
- Patients were at a low baseline risk for VTE as per VTEstimator ©MedAp LLC
- Majority of patients received aspirin 162 mg orally daily for 28-35 days
- Further research is needed to evaluate aspirin monotherapy in patients at high risk for VTE and to compare aspirin to alternative agents when initiated on postoperative day 1

References

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