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Aspirin compared to enoxaparin or rivaroxaban for the prevention of VTE following hip and knee replacement – a retrospective cohort study in Ireland.

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BACKGROUND AND OBJECTIVES

- The risk of venous thromboembolism (VTE) in major orthopaedic surgery is among the highest for all surgical specialties, and can result in significant morbidity and mortality(1).
- Since its inclusion in the American College of Chest Physicians guidelines (1) and the 2018 NICE guidelines(2) , aspirin has gained interest as an alternative to low-molecular-weight heparin (LMWH) or oral anticoagulants, although the evidence for its use is still emerging. Rates of major bleeding, wound complications and infection may be lower with aspirin than with oral anticoagulants or LMWH(3).
- The aim of the study was to establish whether the extended aspirin regimen (a multimodal aspirin regimen) is appropriate for thromboprophylaxis in our patient population by comparing it to two other regimens: the inpatient enoxaparin regimen and the modified rivaroxaban regimen.

METHODS

- This was a retrospective cohort study, and an extension of a previous study carried out in Cappagh National Orthopaedic Hospital (CNOH).
- Ethical approval was granted by CNOH Ethics Committee.
- Data were collected from Bluespier®, the hospital's electronic patient record database. **6,548 patients** undergoing elective primary total hip or knee replacement (THR or TKR respectively) between 1st January 2010 and 30th June 2016, and who attended their six-month review with the CNOH Joint Register, were included.
- **Outcome:** Pre-discharge VTE recorded as an inpatient complication by a clinician, or post-discharge VTE reported at the six-month Joint Register review. A 1% difference in VTE rate between groups was considered clinically significant(3), and a p-value of <0.05 using Fisher's exact test was considered statistically significant.

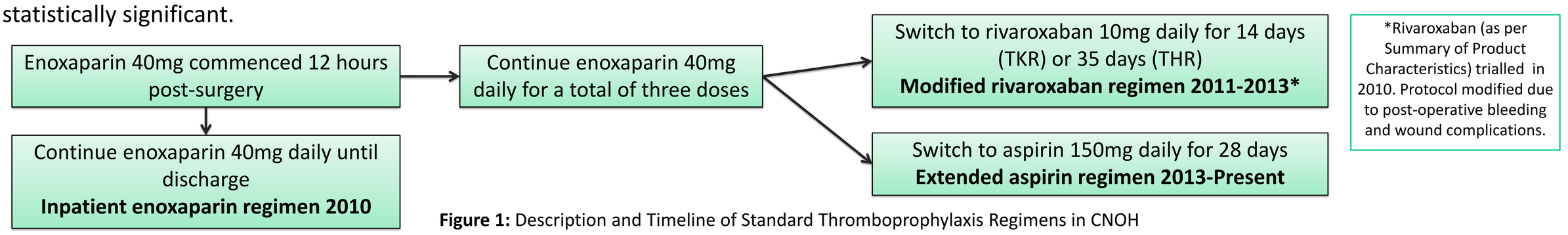


Figure 1: Description and Timeline of Standard Thromboprophylaxis Regimens in CNOH

RESULTS & DISCUSSION

- **Demographics:** Of the 6,548 patients, 56% underwent THR, 55% were female, 57% were aged ≥65 years, 52% had a body mass index of ≥30kg/m^2. These were similar to demographics reported in other studies and registries. 5% had a history of VTE, higher than reported elsewhere, indicating that our patients may have had a higher overall VTE risk than those in similar studies and registries. 36% were taking a regular antiplatelet or anticoagulant.
- **The overall VTE rate in the study population was 0.99%,** lower than rates reported in other studies and registries.
- **There was no statistically significant difference between the VTE rate in extended aspirin group and the two comparator groups. The VTE rate was 0.38% lower in the modified rivaroxaban group compared to the extended aspirin group , less than the clinically significant difference of 1%.** VTE rates were in the expected range, based on those reported with each treatment in similar studies and in review articles.

THROMBOPROPHYLAXIS REGIMEN	VTE RATE
Extended aspirin regimen (n=3,460)	1.04%
Inpatient enoxaparin regimen (n=961)	1.04%
Modified rivaroxaban regimen (n=1,212)	0.66% (p=0.154)

Other regimens n=785; Data missing n=130

- **The treatment groups were demographically well matched overall**. Length of stay was shortest in the extended aspirin group and longest in the inpatient enoxaparin group (mode 3 vs. 7 days, median 4 vs. 7 days). This reflects advances in post-operative management and rehabilitation over the course of the study, allowing earlier discharge. This was a possible confounding factor between these two groups.
- **A prior history of VTE was a statistically and clinically significant risk factor for post-operative VTE** (0.87% vs. 3.54%, p=0.0002).
- Undergoing TKR, older age, female gender, obesity, and regular use of anticoagulant or antiplatelet agents were associated with a higher VTE risk, but these risk factors were not statistically significant.

CONCLUSIONS AND FUTURE RESEARCH

- These findings have implications locally in confirming the efficacy of our current standard thromboprophylaxis regimen, and the results are considered generalisable to patients undergoing elective primary THR or TKR nationally and internationally.
- This study adds to the growing evidence supporting the use of aspirin for thromboprophylaxis in the orthopaedic setting, although further randomised controlled trials comparing aspirin to low-molecular-weight heparin are needed to fully establish its role.
- Future research in CNOH should investigate the risk of bleeding and wound complications with this regimen, as well as the impact of weight-adjusted dosing of enoxaparin for patients weighing ≥100kg(4) introduced in 2017.

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Full list of references available on request

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