

Drug Utilization Evaluation (DUE) on Enoxaparin in Venous Thromboembolism (VTE) Prophylaxis for Hip and Knee Replacement Surgery

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INTRODUCTION

- ❖ Venous thromboembolism (VTE), which includes deep vein thromboembolism (DVT) and pulmonary embolism (PE), contributes to significant mortality and morbidity in terms of chronic venous ulcers and post-phlebitis syndrome.
- ❖ One major risk factor of VTE is orthopedic surgery.
- ❖ The incidence of VTE may be reduced with the use of anti-thrombotic agents.
- ❖ The American College Chest Physician (ACCP) 2012 guidelines (9th Edition) suggested the use of low molecular weight heparin (LMWH) over other prophylactic agents in total knee replacement (TKR) and total hip replacement (THR) surgeries.
- ❖ The National University Hospital (NUH) VTE Prophylaxis Guidelines for post-surgical orthopedics patients list out the criteria for chemoprophylaxis, bleeding risks factors and recommendations for pharmacological prophylaxis when required.
- ❖ Despite guidelines recommendations, sub-optimal use of enoxaparin for VTE thromboprophylaxis has been observed in at risked orthopedic surgery patients who should receive chemical thromboprophylaxis.

AIMS & OBJECTIVES

The objectives of this drug utilization evaluation (DUE) were to

- evaluate the adequacy & appropriateness of VTE prophylaxis with enoxaparin or other chemothromboprophylaxis in THR and TKR patients
- assess the appropriateness of use of enoxaparin; the dose, frequency, indication, contraindications, duration of drug administration and time of first dose initiation
- evaluate the efficacy and safety related outcomes, in terms of VTE events and hemorrhagic events respectively, in a 3 months-follow up period, due to compliance or non-compliance with the NUH guidelines.

METHODOLOGY

This study is a single centre, retrospective drug utilization evaluation study.

Subject Recruitment

- ❖ Inclusion Criteria: NUH patients aged ≥18 years old who have undergone TKR and/or THR surgery from 1st January to 31st March 2013
- ❖ Exclusion Criteria: Foreigners not residing in Singapore; i.e. likely lost to follow-up

Data Collection

❖ Data Type:

- For all studied patients:
 - Demographics and other patient-related data,
 - Relevant laboratory monitoring parameters,
 - Efficacy and safety related outcomes in terms of VTE and hemorrhagic events respectively in a 3 months follow up period from the date of surgery.
- Additionally, for studied patients given enoxaparin:
 - Enoxaparin prescribing patterns; dose, frequency, duration and time of first dose initiation
 - Date, time and duration of surgery

❖ Data References: CPSS, CPRS, and eIMR systems of NUH, case notes and scanned records where applicable

Assessment Criteria

- Appropriateness of Chemoprophylaxis
 - Absence of Contraindications
 - Fit chemoprophylaxis criteria according to NUH VTE prophylaxis guidelines
 - Need for chemoprophylaxis exceeds the bleeding risks
- Appropriateness of Enoxaparin dosing regimen if enoxaparin was prescribed
 - 40mg once daily (OD), initiated 12 hours pre-operatively for 7-10 days or until the risk of VTE diminishes, according to NUH VTE prophylaxis guidelines.

RESULTS & DISCUSSION

- Final Sample Size: 82
- All 82 patients did not have any contraindications to the use of enoxaparin.
- Enoxaparin was the only form of chemoprophylaxis given if any was prescribed.
- For all patients not prescribed with any chemoprophylaxis, mechanical prophylaxis (i.e. calf pumps or TED stocking) were given in the absence of contraindications).

I. Demographics

- 65 (79.3%) were female
- 75 (91.5%) had TKR surgery and 7 (8.5%) had THR surgery
- Mean age: 65.1 years ± 8.57 years (range: 44- 83 years); the majority, 34 (41.5%) patients, were in the age range of 61- 70 years.
- 52 (63.4%) patients were Chinese, 14 (17.1%) were Malay, 12 (14.6%) were Indians, 4 were of other races.

II. Assessment and Evaluation

A) Compliance to NUH VTE Prophylaxis Guidelines in terms of Indication

Table 1: Results for compliance of chemoprophylaxis prescribing patterns to NUH VTE Prophylaxis Guidelines with respect to indication

Group	Characteristics	On prophylaxis	Not on prophylaxis	Total
A	Fits Criteria for Prophylaxis & Benefits > Bleeding Risks	30 (36.6%)	25 (30.5%)	55 (67.1%)
B	Fits Criteria for Prophylaxis & Bleeding Risks > Benefits	-	1 (1.2%)	1 (1.2%)
C	Do Not Fit Criteria for Prophylaxis	11 (13.4%)	15 (18.3%)	26 (31.7%)

- Chemoprophylaxis prescribing patterns for only 46 (56.1%) patients were compliant to NUH guidelines in terms of indication.
- The need for chemoprophylaxis exceeded bleeding risks for 55 (67.1%) patients but only 30 (36.6%) patients were given chemoprophylaxis (enoxaparin).

B) Compliance to NUH VTE Prophylaxis Guidelines in terms of Indication

- 41 patients were given enoxaparin.
- Enoxaparin prescribing patterns in these 41 patients were evaluated regardless of their compliance to NUH guidelines with respect to indication.
- All patients prescribed with enoxaparin had a creatinine clearance of greater than 30mL/min; no dose adjustment was required

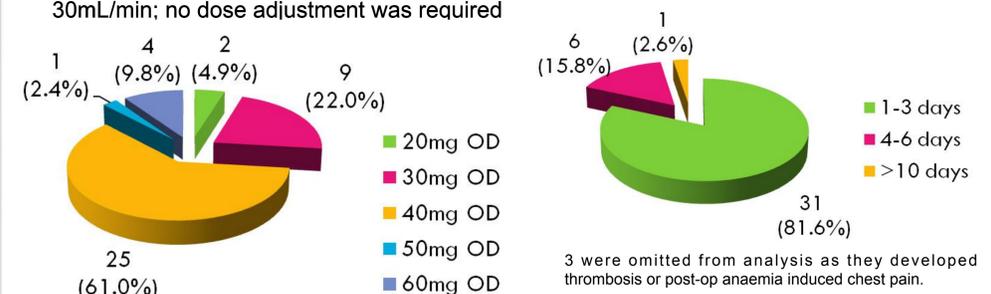


Figure 1: Dose and Frequency

Figure 2: Prophylaxis Duration

Table 2: Time of enoxaparin initiation

Time of Initiation	Number (%)		
	12 ± 2 hr	14-24hr	>24hr
PRE-OP	0 (0%)	2 (4.9%)	2 (4.9%)
POST-OP	6 (14.6%)	21 (51.2%)	10 (24.4%)

C) Safety and Efficacy outcomes in a 3-months period post surgery

- Safety outcomes: No bleeding events due to enoxaparin occurred.
- Efficacy outcomes: 9 patients developed thrombosis. Among which, one patient developed PE while another developed thrombosis in the femoral vein.

Recommendations

- Revamp current guidelines and make them available in the care path.
- Devise system that prompts correct use of enoxaparin when doctor uses OD dosing.
- Share findings of study with orthopedics department to raise awareness.
- Train and educate doctors and pharmacists

CONCLUSION

- ❖ Baseline chemoprophylaxis and enoxaparin usage patterns in NUH TKR and THR patients were revealed in this study.
- ❖ Potential safety gaps within the prescribing practices were identified and recommendations were made.

REFERENCES

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