AN AUDIT: THROMBOPROPHYLAXIS FOR TOTAL HIP REPLACEMENT PATIENTS AT NORTHWICK PARK AND CENTRAL MIDDLESEX HOSPITALS

Soneji ND Agni NR Acharya Anjari M Ashby EM Al-Chalabi S
Imperial College School of Medicine, London

Jagernauth S
Specialist Registrar, Trauma & Orthopaedic Surgery, Northwick Park Hospital, London

Murphy JP
Consultant Trauma & Orthopaedic Surgeon and Honorary Senior Lecturer, Northwick Park Hospital and Imperial College School of Medicine, London

ABSTRACT

It is well documented that hip replacement surgery is associated with a high rate of post-operative venous thromboembolism (VTE). A review of the literature performed by the National Institute of Clinical Excellence (NICE) revealed that after elective hip replacement surgery the DVT incidence was found to be 44% and the PE incidence to be 3%. In addition, compared to no prophylaxis, 28 randomised controlled trials found LMWH to reduce the risk of DVT by 51% and that of PE by 64%.

NICE recommended that patients undergoing total hip replacement (THR) surgery with one or more risk factors for VTE should receive four weeks of either low molecular weight heparin or fondaparinux therapy post-operatively. The British Orthopaedic Association (BOA) subsequently reported this guidance as generic and not context or operation specific. This has lead to confusion amongst Orthopaedic surgeons with regard to the duration of anticoagulation following a THR.

We performed an audit to determine whether patients undergoing a THR at Central Middlesex (CMH) and Northwick Park Hospitals (NPH) receive the trust policy of low molecular weight heparin for 10 days post-operatively.

We retrospectively analysed 94 patients over the age of 60 who had a THR (both electively and after a fractured neck of femur) between April 1st 2007 and August 21st 2008 at CMH and NPH. Only 43% of patients received prophylactic anticoagulation for 10 days or more after their THR. Four of the ninety-four patients suffered a VTE post-operatively. The rate of deep vein thrombosis was 2.1% and of pulmonary embolus was 3.2%.
It is possible that the poor adherence to the trust guideline for post-THR thromboprophylaxis accounted for the high incidence of VTE noted in the study. It is important that VTE incidence is reduced to prevent significant mortality and morbidities. In addition, there can also be costly medico-legal implications if a patient develops a VTE and their caregivers have not complied with prophylactic guidelines.

Better education of healthcare professionals regarding existing hospital policies may help to reduce the poor compliance rates found. Further guidance from the BOA may provide a gold standard policy for anticoagulation following THR to ensure a lower incidence of VTE in the future.

**Abbreviations:**

- **VTE** - Venous thromboembolism
- **DVT** - Deep Vein Thrombosis
- **PE** - Pulmonary Embolus
- **NICE** - National Institute of Clinical Excellence
- **LMWH** - Low Molecular Weight Heparin
- **BOA** - British Orthopaedic Association
- **CMH** - Central Middlesex Hospital
- **NPH** - Northwick Park Hospital
- **THR** - Total Hip Replacement

**KeyWords:** Orthopaedic, Hip replacement, Thromboprophylaxis, Venous thromboembolism, Deep vein thrombosis, Pulmonary embolism

**BACKGROUND**

Venous thromboembolism (VTE) can manifest either as a deep vein thrombosis (DVT) or pulmonary embolism (PE) and is a major cause of discomfort, disability and death. In 2005 it was reported that there are 25,000 deaths per year in England from VTE and it is widely recognized that orthopaedic surgery is linked with high rates of VTE postoperatively.(1,2) It has been reported that without the use of thromboprophylaxis, the incidence of venographically proven VTE ranges from 45% to 57% after total hip replacement surgery (THR).(3)

A review of the literature performed by the National Institute of Clinical Excellence (NICE) revealed that after elective hip replacement surgery the DVT incidence was found to be 44% (521/1165) and the PE incidence to be 3% (21/493).(4) In addition, compared to no prophylaxis, 28 randomised controlled trials found LMWH to reduce the risk of DVT by 51% and that of PE by 64%.

In April 2007 the NICE produced guidelines entitled “Venous Thromboembolism, Reducing the risk of venous thromboembolism in inpatients undergoing surgery”.(4) The key priorities identified in these
guidelines included assessing the patient for risk factors for VTE and effectively communicating with patients about the risks of VTE and thromboprophylaxis.

The guideline recommends thromboprophylaxis in the form of LMWH or fondaparinux be continued for 4 weeks after a THR if the patient has one or more risk factors for VTE. Furthermore, LMWH or fondaparinux therapy should be continued for 4 weeks after hip fracture surgery. The guidelines identified a set of risk factors which are listed in Figure 1.

Following the release of these recommendations, the British Orthopaedic Association (BOA) and NICE held discussions in April 2008 and concluded that this guidance was too “generic” and that further guidance should be made available to orthopaedic surgeons. The BOA agreed to produce more operation and context specific guidance on thromboprophylaxis following a national study.

AIM OF STUDY

At Central Middlesex Hospital (CMH) in North West London it is recommended that all patients undergoing an elective THR should continue LMWH for 10 days following surgery. We performed a retrospective study to determine whether patients undergoing a THR (both electively and after fractured neck of femur) at CMH and Northwick Park Hospital (NPH) receive LMWH for 10 days post-operatively. We attempted to analyse all patients who had THRs between the release of the NICE guideline (1st April 2007) and the present.

METHODS

Patients

All patients who underwent THR at NPH and CMH between April 1st 2007 to August 21st 2008 as identified from medical records. Only patients above the age of 60 were analysed as this is identified as a risk factor for VTE and would automatically qualify all of them for 4 weeks of LMWH or fondaparinux post-operatively according to the existing NICE guidelines.

Data collection

The data collected included; patient age, whether the THR was an elective procedure or after a fractured neck of femur, which hospital the THR was done, the length of hospital stay, anticoagulation received in hospital and post-discharge and any incidence of VTE post-operatively. This was done by analysing the patient notes and contacting the patients by telephone. The notes of any patient with a VTE post-operatively were re-analysed.
RESULTS

Subjects
There were 197 patients over the age of 60 who had a THR at CMH and NPH between April 1st 2007 and August 21st 2008. We attempted to find in-hospital anti-coagulation notes, post-discharge anti-coagulation notes and contact these patients. All three aims were completed in 94 patients. Of these, 87 patients underwent elective total hip replacements (53 at CMH and 34 at NPH) and the remaining 7 patients had THRs after a fractured neck of femur (5 at CMH and 2 at NPH). The average age of the patients was 74 years old.

Length of Hospital Stay

The average length of hospital stay of all 94 patients was 7.1 days. For elective THRs the average length of stay was 6.6 days (6.5 days at CMH and 7.0 days at NPH) and for THRs after a fractured neck of femur the average length of stay was 12.4 days (11.8 days at CMH and 14 days at NPH).

Length of Anti-Coagulation post-Total Hip Replacement

After an elective THR the mean length of anti-coagulation was 8.7 days (9.8 days at CMH and 5.5 days at NPH). Similarly, the mean length of anti-coagulation post-THR after a fractured neck of femur was 9 days (10.4 days at CMH and 7 days at NPH).

After an elective THR 43% of patients (37 of 87 patients) were found to have received anticoagulation for 10 days or more. The rate was 62% at CMH (33 of 53 patients) and 12% at NPH (4 of 34 patients). Similarly after a THR following a fractured neck of femur, 43% of patients (3 of 7 patients) received anticoagulation for 10 days or more. The rate was 60% at CMH (3 of 5 patients) and 0% at NPH (0 of 2 patients). These results are summarised in Figure 2.

Incidence of Venous Thromboembolism post-Total Hip Replacement

4.3% of our patients (4 of 94 patients) suffered a VTE. The first patient was a 67 year old female who suffered a PE 2 days after an elective THR and then was started on LMWH and warfarin after the PE was diagnosed. There was no contraindication to start the anticoagulation earlier at the correct time.

The second patient was an 82 year old female who stayed in hospital for 8 days after her elective THR. She was prescribed LMWH on post-operative days 1-8 but none after her discharge from hospital. She then suffered a DVT on post-operative day 12 and a PE on post-operative day 29.

The third patient was an 80 year old female who stayed in hospital for 25 days after her THR which she had following a fractured neck of femur. She
was anti-coagulated with LMWH for these 25 days, however she suffered a DVT 1 week after discharge. She was noted to be slow mobilising post-operatively which was cited to be a possible cause of the DVT.

The final patient was a 77 year old female in hospital for 8 days after her THR which she had following a fractured neck of femur. She was anti-coagulated with LMWH until discharge and for 6 days post-discharge totalling 14 days of anticoagulation. She however, suffered a PE 12 days post-discharge.

DISCUSSION

It is likely that the poor rate of ten day thromboprophylaxis post-elective hip replacement accounted for the high incidence of VTE noted in our study. Other studies have found similar rate of adherence to guidelines. Vallano et al found thromboprophylactic guidelines were only adhered to in 42% of patients and Goldhaber et al found that routine preventative measures of thromboprophylaxis are not given to 58% of medical patients.(5,6)

It is important that VTE incidence is reduced to prevent the significant mortality and morbidities detailed earlier. In addition, there can also be costly medico-legal implications if a patient develops a VTE and their caregivers have not complied with prophylactic guidelines.

Better education of healthcare professionals regarding existing hospital policies may help to reduce the poor compliance rates found. The patient must be integrally involved in the compliance to any thromboprophylactic measures prescribed. This may involve developing patient organisations and providing educational materials for patients.

As identified in the NICE guidelines further research is required to answer certain questions about optimal thromboprophylaxis practice. These include questions on the optimal timing of low molecular weight heparin administration and on the incidence of VTE and major bleeds.(4) The BOA and NICE are also developing a national study on VTE prophylaxis which is due to call all orthopaedic surgeons to participate and expedite data collection.

REFERENCES

Thromboembolism, Reducing the risk of venous thromboembolism in inpatients undergoing surgery
