Northampton General Hospital NHS
NHS Trust

Thromboprophylaxis in the Antenatal; Intrapartum and Postnatal Periods

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1 INTRODUCTION & AIMS

Venous thromboembolism (VTE) was the leading cause of direct maternal deaths in the last triennium (Drife et al, 2004). There was evidence in substandard care in over half of cases with most deaths occurring in the post partum period. Of particular note is the number of deaths after vaginal delivery and there has been a steady decline in numbers after caesarean section following the Royal College of Obstetricians and Gynaecologists (RCOG) guidelines for thromboprophylaxis. Substandard care included failure to recognize risk factors, delay in implementing prophylaxis or treatment, inadequate doses administered and failure to appreciate symptoms and signs of VTE. Although rare, VTE is a largely preventable cause of death and serious morbidity.

The RCOG updated its guidelines for preventing venous thromboembolism in antenatal and postnatal women in 2009, publishing the green-top guideline "Reducing the risk of thrombosis and embolism during pregnancy and the puerperium". The risk assessments in this guideline aim to administer low molecular weight heparin in prophylactic doses to any woman who has a 1% risk of thromboembolism. Our guideline is based on this RCOG publication.

2. SCOPE

This guideline is intended for all staff caring for women within the maternity services and provides information on assessment of women's risk of VTE. Standardised risk assessment tools and protocols to reduce risk are provided.

It does not cover the management of women who have a confirmed or suspected thrombosis; the guideline Thrombophilia and Thromboembolism in Pregnancy should be followed.

This guideline does not cover the management of women who have had a previous VTE or a thrombophilia – the care of these women is covered in 'Thrombophilia and Thromboembolism in Pregnancy'.

3. DEFINITIONS

VTE	Venous thromboembolism
RCOG	Royal College of Obstetricians & Gynaecologists
LMWH	Low molecular weight heparin

GCS	Graduated compression stockings
PPH	Post partum haemorrhage
SLE	Systemic lupus erythematosus
APS	Antiphospholipid Syndrome

4. VENOUS THROMBOPROPHYLAXIS IN PREGNANCY; INTRAPARTUM AND POSTNATAL PERIODS

Major changes from previous guideline

1. All women are to be risk assessed for venous thromboembolism – this includes a formal assessment at booking, prompting referral to a Consultant if necessary. It also includes a risk assessment for women who have had a Caesarean section – women who have undergone an emergency Caesarean section will always require thromboprophylaxis but those undergoing elective Caesarean section will require it only if there are other risk factors present.

2. Knee length GCS are no longer felt to be of great benefit to the pregnant or postpartum woman. Thigh-length stockings are recommended only in the following situations:

Those who are hospitalised with a contraindication to LMWH
Those who are hospitalized post-Caesarean section and considered to be at particularly high risk of VTE (for example, previous VTE or more than 3 risk factors). They should be used in conjunction with LMWH.
Outpatients with prior VTE (usually with LMWH)
Women travelling long distances, more than 4 hours (not just air travel)

Knee length stockings may be considered if thigh length stockings are ill fitting or compliance is poor.

3. The duration of postnatal prophylactic LMWH for those women at risk of VTE has increased to 7 days for women of intermediate risk and 6 weeks for those at high risk.

4.1 Good practice points with regard to VTE

All women, regardless of risk factors, should be warned of the symptoms and signs of VTE and advised to seek medical attention if these occur. Information is available on Page 16 of the Antenatal Notes and Page 6 of the Postnatal Notes.

All women should be advised to remain well hydrated and mobile during pregnancy, labour and the peurperium.

4.2 Low Molecular Weight Heparin for Thromboprophylaxis

LMWHs are the treatment of choice for short term thromboprophylaxis. The physiological changes of pregnancy result in an increased volume of distribution of LMWH and decreased half life, so higher weight adjusted doses are necessary (see table below).

Renal Failure – if creatinine clearance is <20ml/min the maximum dose of Enoxaparin is 20mg daily.

Body weight	**Enoxaparin dose**
<50 kg	20 mg OD
50-90 kg	40mg OD
91-130 kg	60mg OD
131-170 kg	80mg OD
>170 kg	0.6 mg/kg/day

4.2.1 Contraindications to Enoxaparin

Active bleeding/bleeding disorder
Renal failure (CrCl<30ml/min)
Active gastric/duodenal ulceration
Recent haemorrhagic stroke (in last 4 weeks)
Thrombocytopenia (platlets less than 75 x $10^{3)}$
Previous heparin induced thrombocytopenia
Hypersensitivity to Enoxaparin
Acute bacterial endocarditis
Therapeutic Enoxaparin/Warfarin
Bleeding disorder such as von Willebrands disease, haemophilia or aquired coagulopathy
Severe liver disease (prothrombin time above normal range or known varices)

The following situations increase the risk of bleeding so Enoxaparin should be prescribed only following careful consideration of the risks and benefits and following discussion with a Consultant:

Women with active antenatal or postnatal bleeding
Women considered at increased risk of major haemorrhage such as placenta praevia
Uncontrolled hypertension (blood pressure greater than 200mmHg systolic or greater than 120mmHg diastolic)

4.3 Antenatal Booking Assessment

All women should undergo an assessment of risk factors for VTE at their booking appointment. This will be performed using a sticker that will be adhered to page 11 (management plan) of the antenatal notes.

Antenatal Risk Factors for Thromboembolism	Tick
Thrombophilia (congenital or acquired)	
Previous VTE	
Medical disorders – heart or lung disease, SLE, cancer, inflammatory conditions, nephritic syndrome, sickle cell disease, intravenous drug user	
Age greater than 35	
Booking BMI greater than 30	
Parity greater than or equal to 3	
Smoker	
Significant varicose veins	
Current systemic infection	
Immobility eg paraplegia, SPD, long-distance travel	
Current hyperemesis/ dehydration/ ovarian hyperstimulation syndrome	
Current Pre-eclampsia	
Multiple pregnancy or Assisted Reproductive Therapy	

Red - refer to Consultant clinic to consider thromboprophylaxis in antenatal period

3 ambers – refer to Consultant clinic to consider thromboprophylaxis in antenatal period

2 ambers – general advice to patient re reducing risk of thromboprophylaxis (remaining mobile and well hydrated) and warn about possible need for thromboprophylaxis if admitted during pregnancy and after delivery (depending on labour and mode of delivery

Thromboprophylaxis should be commenced as early as practically possible during pregnancy so these referrals should be seen as soon as possible, but definately within 2 weeks.

Any woman requiring thromboprophylaxis throughout the antenatal period must have a plan made for labour. Details of recommendations for the management of prophylactic LMWH in labour can be found in the 'Thrombophilia and Thromboembolism in Pregnancy' guideline.

4.4 Antenatal Admissions to a Maternity Ward

Any woman admitted during the antenatal period should be risk assessed for VTE using the risk assessment stickers. This should initially be performed by the admitting doctor and repeated by the midwife on a daily basis as the risk may change.

Antenatal Risk Factors for Thromboembolism	Tick
Thrombophilia (congenital or acquired)	
Previous VTE	
Medical disorders – heart or lung disease, SLE, cancer, inflammatory conditions, nephritic syndrome, sickle cell disease, intravenous drug user	
Surgical procedure during current admission eg appendicectomy	
Age greater than 35	
Booking BMI greater than 30	
Parity greater than or equal to 3	
Smoker	
Significant varicose veins	
Current systemic infection	
Immobility eg paraplegia, SPD, long-distance travel	
Current hyperemesis/ dehydration/ ovarian hyperstimulation syndrome	
Current Pre-eclampsia	
Multiple pregnancy or Assisted Reproductive Therapy	

Red - requires thromboprophylaxis – prescribe enoxaparin
2 ambers – requires thromboprophylaxis – prescribe enoxaparin

If required, LMWH should be prescribed for the duration of the inpatient stay. The details of the risk assessment should be checked on discharge home to ensure that the LMWH can be discontinued.

4.5 Assessment of Risk Factors in Labour

A risk assessment for thromboembolism should be performed for every woman admitted in labour as part of the initial assessment.

The following table is included in the Perinatal Institute's Birth Record

Intrapartum Risk Factors for Thromboembolism			
None identified		Parity > 3	
Major current illness		BMI > 30	
Gross varicose veins		Immobility	
Age > 35		Hypertensive disease	
Family or personal history		APLA/Lupus	

Labouring women who are unwell, immobile or have two or more risk factors should be advised to have GCS fitted and extra care should be taken to avoid dehydration.

LMWH should be avoided until after delivery in the majority of cases however, if a woman is deemed very high risk the Registrar should discuss management with the consultant on call

High risk women who have been on LMWH in the antenatal period should have an individual management plan documented in their notes. For further information for management of patients at high risk of VTE in labour, please see the Thrombophilia and thromboembolism in pregnancy guideline.

4.6 Postnatal Risk Assessment for thromboembolism

When completing the key to risk on page 3 of the purple postnatal notes, a separate thromboembolism risk sticker should also be completed and adhered to page 5 (management plan).

Postnatal Risk Factors for Thromboembolism	Tick	Duration
Anyone requiring continuous antenatal heparin		6 weeks
Previous VTE		
Medical disorders – heart or lung disease, SLE, cancer, inflammatory conditions, nephritic syndrome, sickle cell disease, intravenous drug user		7 days
Asymptomatic thrombophilia (inherited or aquired)		
Prolonged hospital admission		
BMI greater than 40		
Caesarean section in labour		
Caesarean section not in labour including elective		
Age greater than 35		
Booking BMI greater than 30		
Parity greater than or equal to 3		
Smoker		
Significant varicose veins		
Current systemic infection		
Immobility eg paraplegia, SPD, long-distance travel		
Current Pre-eclampsia		
Any surgical procedure in puerperium		
Mid-cavity rotational operative delivery		
Prolonged labour (greater than 24 hours)		
PPH greater than 1 litre or requiring blood transfusion		

Any patient who has had a previous VTE or has required Enoxaparin in the antenatal period should be prescribed enoxaparin for 6 weeks postnatally.

Other patients who have a red score require enoxaparin for at least 7 days, longer if this is felt to be appropriate eg persisting risk factors.

Any patients with two or more amber risks should be prescribed Enoxaparin for at least 7 days. However, if they have persisting risk

factors (lasting for more than 7 days postpartum) or more than 3 risk factors, consider extending the duration.

Women with three or more persisting risk factors (lasting for more than 7 days postpartum) should be given graduated compression stockings in addition to LMWH.

If a patient is to be discharged home postnatally on Enoxaparin for longer than 7 days please discuss with the patients Consultant unless they are already aware.

Ideally this assessment should be repeated daily for inpatients but as a minimum on day 4 and day 7. Reassessments should also occur if new problems arise in the postnatal periods such a surgery, severe infection, readmission to hospital or choosing to travel long distances.

Other points to remember regarding postnatal thromboprophylaxis:

- Postnatal thromboprophylaxis should be given as soon as possible after delivery, except if the woman has had epidural for pain relief in labour or if there is ongoing bleeding or a risk of further haemorrhage.

- In high risk women with, or at risk of, ongoing haemorrhage, GCS should be applied until risk of bleeding is deemed to have subsided, then LWMH can be initiated.

- Women who have had epidural for pain relief in labour should be given LMWH 6 hours after epidural catheter removal

- LMWH should continue for 7 days. Women should be taught how to administer the Enoxaparin so that they can continue to do this when they are discharged home. They will receive a pack containing information regarding enoxaparin, the 7 doses of enoxaparin and a sharps bin.

- Any postnatal woman requiring an inpatient stay should have risks re-assessed on a daily basis as part of the routine postnatal check.

4.7 Assessment of risk factors following Caesarean Section

All postnatal women must have a thromboembolism risk assessment performed. Women who undergo Emergency Caesarean Section will all require postnatal Enoxaparin for 7 days. Women who undergo Elective Caesarean section may require postnatal Enoxaparin depending on other risk factors.

- The anaesthetist will be responsible for prescribing and giving the first dose of LMWH, after discussion about the risk assessment and contra-indications with the obstetrician delivering.

- After spinal anaesthesia, LMWH should be given 4 hours after the spinal (or after 24 hours if traumatic spinal)

- After epidural anaesthesia, LMWH should be given 6 hours after removal of the epidural catheter

- Early mobilization and avoidance of dehydration is imperative

4.9 Monitoring

In women with normal renal function monitoring of anti-Xa levels are not required at the doses used for thromboprophylaxis.

Any patient needing to continue on LMWH for more than 7 days requires a full blood count to exclude the rare side effect of heparin induced thrombocytopaenia. This is taken by the midwife on Day 7.

4. 10 Breastfeeding

Enoxaparin is not a contraindication to breastfeeding. Enoxaparin is a large molecule which is unlikely to pass in to breast milk in clinically significant amounts. Oral bioavailability is poor therefore small amounts which may be present in milk would not be orally absorbed. No adverse effects have been seen in babies due to breastfeeding whilst the mother is taking enoxaparin.

4.11 Signs and symptoms of thromboembolism

The management of women with signs and symptoms of a deep vein thromboembolism in pregnancy is covered in the guideline 'Thrombophilia and Thromboembolism in Pregnancy'. This guideline must be referred to for further guidance on the management of any woman who displays any of the following signs and symptoms:

<u>Deep vein thrombosis</u>
- Limb pain, tenderness, swelling or inflammed area
- Increase in limb circumference
- Positive Homan's sign – pain felt in the calf when the foot is dorsiflexed with the leg extended.

<u>Pulmonary embolism</u>
- Shortness of breath, chest pain
- Cyanosis
- Reduced O^2 saturations
- Increased respiratory rate

REFERENCES & ASSOCIATED DOCUMENTS

Confidential Enquiries into Maternal Deaths in the United Kingdom (2001) Why Mothers Die 1997 – 1999 London

Confidential Enquiry into Maternity and Child Health (2004) Why Mothers Die 2000 – 2002 London

Confidential Enquiry into Maternity and Child Health (2007) Saving Mothers' Lives: Reviewing Maternal Deaths to Make Motherhood Safer 2003-2005 ; London

National Institute for Health and Clinical Excellence (2004) Caesarean Section; London

National Institute for Health and Clinical Excellence (2007) Intrapartum Care: Care of healthy women and their babies during childbirth; London

Royal College of Obstetricians and Gynaecologists; Royal College of Anaesthetists; Royal College of Midwives; Royal College of Paediatrics & Child Health (2008) Standards for Maternity Care: Report of a Working Party; London RCOG

Royal College of Obstetricians & Gynaecologists (2009) Reducing the risk of thrombosis and embolism during pregnancy and the puerperium; London RCOG

ASSOCIATED DOCUMENTS

NGH (2008) Thrombophilia and Thromboembolism in Pregnancy

MONITORING & REVIEW

As part of the maternity audit programme, compliance of this guideline will be demonstrated via clinical audit of the following standards:

- All pregnant women will have a correct risk assessment for VTE:
  - at booking
  - if admission is required
  - on admission in labour or requiring IOL
  - postnatally

- All women who require LMWH based on the risk assessment are prescribed the correct dose and for the relevant time period

- All women who require LMWH in the antenatal period will have an individualised management plan documented in the notes.

The above standards will be audited by midwives and/or obstetricians on an annual basis, and co-ordinated by the Maternity Clinical Effectiveness Group. The process will involve collecting retrospective data from 50 maternity records of women admitted to the maternity unit in the antenatal; intrapartum and postnatal periods. The resultant audit report will be made available to other Directorate Groups for dissemination via the Directorate Governance Group.

Action Plan/Recommendations

In the event of the audit standards not being met; the Maternity Clinical Effectiveness Group will formulate an action plan with recommendations. This plan will be submitted to the Directorate Governance Group for ratification and ongoing monitoring.