VENOUS THROMBOSIS OCCURRING IN THE PRESENT PREGNANCY

WOMAN PRESENTS WITH SIGNS/ SYMPTOMS OF VTE:

- **Deep vein thrombosis (DVT):** Leg pain; swelling; tenderness; oedema; colour change of leg; low grade fever.
- **Pulmonary embolism (PE):** Dyspnoea; chest or abdominal pain; collapse; tachycardia; haemoptysis; pallor or cyanosis; raised JVP; signs of DVT or right ventricular strain.

**ASSESS RISK FACTORS FOR VENOUS THROMBOEMBOLISM (VTE):**

- Age >35
- Infection
- Malignancy
- Obesity
- Personal /family history of thrombosis
- Smoker
- Surgery
- Varicose veins
- Blood loss >1L
- Caesarean birth
- Forceps (midcavity or rotational)
- Hyperemesis/ dehydration
- Multiparity >3
- Multiple pregnancy
- Pre-eclampsia
- Pregnancy/puerperium
- Prolonged labour >24hrs
- Cardiac disease
- Nephrotic syndrome
- Ovarian hyperstimulation syndrome
- Paraplegia/ pelvic trauma/ long distance travel
- Prolonged immobilisation
- Sickle cell disease
- Thrombophilia

**DIAGNOSE/EXCLUDE**

- **DVT:** Doppler ultrasound, compression ultrasonography, or contrast venography.
- **PE:** Doppler ventilation-perfusion (V/Q) lung scanning or Computed tomographic pulmonary angiography (CTPA); Chest X-Ray (if normal attend Compression Doppler)

**TREATMENT**

- Consult with physician experienced in management of medical disorders in pregnancy.
- Take full blood count, coagulation screen, U&E’s, LFT’s to confirm normal prior to treatment.
- Check Anti-factor Xa activity 8-12hrs post dose during initial hospitalisation.
- **Confirmed PE or CVT above knee:** At least 6 months therapeutic anticoagulation, followed by prophylaxis for the remainder of the pregnancy & 6 weeks postpartum.
- **Confirmed DVT confined to the calf:** Therapeutic anticoagulation for at least 3 months then prophylactic anticoagulation if further Doppler studies demonstrate resolution of the thrombus and no post thrombosis syndrome in affected leg.

- **Therapeutic anticoagulation:** Enoxaparin 1mg/kg bd or 1.5mg/kg daily
  Or dalteparin 100IU/kg bd or 200IU/kg once daily
- **Prophylactic anticoagulation:** 40mg enoxaparin or dalteparin 5000IU daily

**BIRTH**

- Planned birth preferable; Discontinue anticoagulant 24 hours prior (Induction/ Caesarean)
- If spontaneous labour, send blood for cross match and consult Haematologist and/ or Obstetric physician, and Anaesthetist
AIM

- The appropriate management of a woman with venous thrombosis in the current pregnancy.

BACKGROUND

Venous thrombo embolism (VTE) represents a major cause of morbidity and mortality during pregnancy. While VTE is the leading cause of direct maternal mortality in the UK and major cause in many countries such as Australia and USA, most VTE events during pregnancy are not fatal. The risk of VTE during pregnancy is up to 10 times that of a non pregnant woman of the same age range. The risk of VTE in the puerperium is further increased about 25 times and this risk is 3 – 16 times greater after caesarean birth, especially emergency caesarean, than with vaginal birth. The increased pregnancy related risk of VTE is due to the fact that pregnancy itself is a hypercoagulable state.

RISK FACTORS

VTE may occur at any time during pregnancy, however the puerperium is the time of highest risk. Risk factors include:

- Age over 35 years
- Caesarean birth
- Excessive blood loss (>1000ml)
- Forceps (mid-cavity or rotational)
- Inflammatory disorders and infection
- Malignancy
- Maternal heart disease
- Multiparity >3
- Multiple pregnancy
- Nephrotic syndrome
- Obesity
- Ovarian hyperstimulation syndrome/ hyperemesis/ dehydration
- Personal / Family history of thrombosis
- Pre-eclampsia
- Pregnancy /puerperium
- Prolonged immobilisation – including paraplegia, pelvic trauma, long distance travel
- Prolonged labour (>24hrs)
- Sickle cell disease
- Smoker
- Surgical procedure
- Thrombophilia
  - Antithrombin deficiency
  - Protein S or C deficiency
  - Activated protein C resistance / factor V Leiden
  - Prothrombin gene mutation
  - Antiphospholipid antibodies / lupus anticoagulant
- Varicose veins
DIAGNOSIS

Iliofemoral and calf vein thromboses are equally common in relation to pregnancy. Clinical diagnosis of deep vein thrombosis (DVT) and pulmonary thromboembolism (PTE) is unreliable. Prompt objective testing should be performed when there is clinical suspicion of these diagnoses. Treatment may be commenced if the index of suspicion is sufficiently high, pending objective confirmation by testing, unless strongly contraindicated.

COMMON SIGNS AND SYMPTOMS OF VTE ARE:

- **DVT**: Leg pain\(^2\) or discomfort (80% of gestational DVT afflicts the left leg), swelling\(^2\), tenderness, oedema, colour change of leg, and low-grade fever\(^2\). The pain of DVT is usually in the calf, popliteal fossa, anterior thigh or the groin. Occasionally, iliopeleral thrombosis causes pain in the lumbosacral region. Rarely, DVT involves arm veins, particularly after insertion of long intravenous lines from the cubital fossa.

- **PTE**: Dyspnoea\(^2\), chest or abdominal pain\(^2\), collapse\(^2\), tachycardia, haemoptysis\(^2\), pallor or cyanosis, raised JVP, signs of right ventricular strain, and signs and symptoms associated with a DVT.

OBJECTIVE TESTING FOR DIAGNOSIS INCLUDES:

- **DVT**: Doppler ultrasound, compression ultrasonography\(^1,2\), or contrast venography.

- **PTE**: Doppler ventilation-perfusion (V/Q) lung scanning is the procedure of first choice or computed tomographic pulmonary angiography (CTPA) is used to diagnose/exclude.\(^1\) The V/Q radiation dose is very low and the patient should be reassured. CT may sometimes be necessary particularly if there is high clinical suspicion and a low or intermediate probability isotope scan. A chest X-ray cannot diagnose pulmonary embolism. However, it must always be performed to consider the differential diagnoses such as infection, heart failure and pneumothorax.\(^2,8\) If chest X-ray normal, attend Compression Doppler.\(^2\)

Advise women that V/Q scanning has slight increase risk of childhood cancer compared to CTPA, but lower risk of maternal breast cancer\(^2\), with lower maternal radiation\(^8\).

TREATMENT

The treatment of VTE in pregnancy involves special considerations and carries different hazards from those outside pregnancy. Where possible, consult with a Physician experienced in the management of medical disorders in pregnancy.

**Confirmed pulmonary embolism or proximal leg DVT (above knee):**

- These require full therapeutic anticoagulation for at least six months followed by prophylaxis for the remainder of the pregnancy and 6 weeks of the puerperium.\(^5\) Subcutaneous low molecular weight heparin (LMWH) should be given for 3-7 days in Hospital followed by self-administration at home.\(^2\) Oxygen and other supportive treatments are given as necessary.

**Confirmed thrombosis confined to the calf:**

- Therapeutic anticoagulation may be replaced after 3 months by prophylactic anticoagulation if Doppler studies demonstrate resolution of the thrombus, and there is no post-thrombosis syndrome in the affected leg (swelling, pain etc). If symptoms are still present, therapeutic anticoagulation should be continued. For thrombosis confined to the calf, outpatient treatment with self-administered LMWH is acceptable.

- Strict rest in bed is not necessary.\(^2\)

- A bed cradle is helpful, when the leg is very painful.
• A graduated compression stocking may be applied to the affected leg, if tolerated, when the patient becomes ambulant. Compression stockings worn for two years can reduce mild/moderate post-thrombotic syndrome rates from 47-20% and severe cases from 23-11%.2

**DOSAGE OF LOW MOLECULAR WEIGHT HEPARIN (LMWH):**

Before anticoagulant therapy take full blood count, coagulation screen, urea & electrolytes and liver function tests to confirm they are normal before starting treatment.2 Unless contraindicated, treatment should continue until diagnosis is excluded by objective testing.2

**“Therapeutic dose”**

Either enoxaparin (Clexane; Pregnancy category C) subcutaneous 1mg/kg twice a day or 1.5mg/kg once daily7, 8, 10, or dalteparin (Fragmin) 100 IU/kg twice a day or 200IU/kg once daily11 may be prescribed for 3 to 6 months, which will continue into the puerperium if the thrombosis occurred in late pregnancy2, 8, 11.

**“Prophylactic dose”**

In some cases, the dose of LMWH is reduced after 3 months to enoxaparin 40mg daily7 or dalteparin 5000 IU daily11 as Prophylaxis until delivery and for at least 6 weeks postpartum. If the thrombosis occurred close to delivery, the full therapeutic dose should continue postpartum until expiry of the 3-month treatment period.11

**Late pregnancy and intrapartum anticoagulation**

Anticoagulation at a therapeutic dose is incompatible with safe birth by any route.

LMWH should be discontinued 24 hours before planned birth.2, 11 In all cases of planned birth, the last dose of LMWH should be at least 24 hours before the time of induction / Caesarean, and should be reduced to 40mg of enoxaparin or 5,000 IU of dalteparin subcutaneously.

If labour occurs whilst the woman is anticoagulated blood should be sent for cross matching and consultation sought with the Haematologist and / or Obstetric Physician, and Anaesthetist. Planned birth is preferable, to allow all necessary preparations6, 9.

Where therapeutic anticoagulation is necessary after 37 weeks, consideration may be given to transfer to unfractionated heparin by intravenous infusion.11 Although this has an advantage over LMWH in shorter duration of action and in reversibility, there is no evidence that the risk of peripartum bleeding is reduced by this stratagem.

**Monitoring of LMWH**

Anti-factor Xa activity should be checked 8 to 12 hours post dose at least once during the hospitalisation to establish adequacy of the selected dose. However, the chosen dose should not be changed unless the level is outside the range of 0.4 IU/mL – 0.8 IU/mL, and only with Physician consultation; because the validity of anti Xa monitoring has not been established11. Blood should be collected in a blue top coagulation tube and must be filled to the collection mark on the tube. No monitoring of levels is required for prophylactic doses.
REFERENCES


