

# Thromboembolic disease in pregnancy

# Objectives

- ▶ List the predisposing factors for thromboembolism in pregnancy
- ▶ Discuss the clinical presentation and management of superficial thrombophlebitis
- ▶ Discuss the clinical presentation and management of deep vein thrombosis
- ▶ Discuss the clinical presentation and management of pulmonary embolism in pregnancy

# Introduction

- ▶ Venous TED is one of the major causes of direct maternal deaths. Those who survive suffer significant morbidity
- ▶ 2-4 fold increase compared to non-pregnant state
- ▶ Cesarean delivery > vaginal delivery
- ▶ 75% of DVT occur antepartum (equally distributed among all three trimesters)
- ▶ 43-60% of PE occur after delivery during the first 2 weeks and in 80% of cases it is left-sided
- **PE is the major non-obstetric cause of maternal mortality**
  - 2/100 000 pregnancies Fatality rate 15%

# Why pregnancy is associated with increased tendency for clotting ?

- ▶ Venous stasis
- ▶ Increased production of clotting factors V, VIII, Von Willebrand, fibrinogen
- ▶ Decreased anticoagulants protein S and antithrombin
- ▶ Decreased fibrinolytic activity via increased plasminogen activator inhibitor
- ▶ Endothelial damage during preg and delivery

# Risk factors for TED

- ▶ Age over 35 yrs
- ▶ Multi parity (  $\geq 4$  )
- ▶ Obesity ( over 80 kg )
- ▶ PET
- ▶ Immobility
- ▶ Infections
- ▶ Pelvic or leg trauma
- ▶ Smoking
- ▶ Atrial fibrillation
- ▶ Personal or family H/O TED
- ▶ Thrombophilia (antithrombin deficiency, factor V Leiden, protein C, protein S DEF.)
- ▶ Antiphospholipid antibodies and lupus anticoagulant
- ▶ Operative delivery (em. C/S > elective )
- ▶ Previous history of IUFD, early PET, severe IUGR, abruption

# Types of venous thrombosis

- ▶ Superficial thrombo phlebitis
- ▶ Calf (below knee)deep vein thrombosis
- ▶ Proximal or ilio-femoral deep venous thrombosis--- 70% of DVT in preg

# Diagnosis

- ▶ Clinical diagnosis is difficult and inaccurate in over 60% of cases of TED
- ▶ Leg symptoms (oedema and pain) and dyspnea are common in pregnancy/ mimic symptoms of DVT/PE
- ▶ Tachycardia may be a normal physiologic response.

# Superficial thrombophlebitis

- ▶ The condition is misnamed. It is not infective.  
the redness surrounding the affected vein is a reaction to clot
- ▶ It is the commonest form of venous thrombosis in pregnancy & puerperium. It occurs in about 1% of patients and nearly always arise in existing varicose veins
- ▶ The diagnosis is clinically obvious (tenderness, erythema, palpable cord-like veins)



- ▶ Treatment is usually symptomatic with compression bandage, leg elevation and to encourage mobility
- ▶ In some pt's DVT need to be excluded as it may co-exist with it . Even more extension to involve deep veins rarely occurs

# Calf deep venous thrombosis (CVT)

- ▶ The most common clinical features are pain, local tenderness, swelling, change in skin colour and temperature
- ▶ Most of CVT resolve spontaneously (75-80%) and run a benign course except when the thrombus spreads up to involve the proximal deep veins (20-25%) in which case there is 50% risk of pulmonary embolism

# Proximal/ Iliofemoral DVT

- ▶ It occurs more commonly than CVT and over 80% is left-sided
- ▶ Symptoms are more dramatic with pain and swelling involving the entire limb
- ▶ If the arterial supply is unimpaired, the leg appears swollen, blue & warm. On the other hand if arterial spasm occurs secondary to irritation from the nearby clotted vein, the leg becomes swollen, painful, white & cold

# Investigations for DVT

- Contrast venography
- Duplex ultrasonography /commonly used with a sensitivity and specificity of 97%
- Compression ultrasonography
- MRI --- sensitivity and specificity 100% in nonpregnant Pt
- Pelvic vein ultrasound, CT scan and MRI are all tests that can be used to look for pelvic clot.
- D dimer test not useful in pregnancy because it normally increases with gestational age

# Pulmonary embolism (PE)

- ▶ A high index of suspicion is always needed for the diagnosis of PE especially in patients with DVT or risk factors for VTE
- ▶ The maternal mortality rate from untreated PE is 13% with the majority within 1 hr of the event
- ▶ With early diagnosis & treatment, the survival rate is between 92-95%

# The common symptoms & signs of PTE

- Tachypnoea
- Dyspnoea
- Haemoptysis
- Pleuritic chest pain
- Tachycardia
- Cyanosis
- Pyrexia
- Syncope or varying degree of shock

These S &S are non-specific and in most cases there is no prior clinical evidence of DVT

# Investigations for suspected

- **PTE** Chest X- ray
- ECG
- Blood gases
- Compression duplex Doppler to exclude DVT
- Ventilation-perfusion isotope lung scan (V/Q)
- Helical or spiral CT scan is regarded superior to V/Q scan
- Spiral CT
- Arteriography
- CT angiography

# Risk of radiologic procedures to the fetus

## ▶ Radiation exposure of up to 0.05 Gy (5 rad) in utero:

### ▶ Oncogenicity

- ▶ Relative risks of 1.2-2.4

- ▶ Absolute risk of malignancy (baseline) in fetus is estimated to be 0.1%.

### ▶ Teratogenicity

- ▶ No increase in pregnancy loss, growth or mental retardation





# Treatment of acute phase TED

- ▶ Standard heparin IV or the more preferred LMWH S.C should be started once the diagnosis is clinically suspected until excluded by objective testing
- ▶ Treatment aims at achieving APTT 2-2.5 the control for 5-7 days then continue with prophylactic dose generally for 6-12 weeks post-nataly
- ▶ For PE it should be continued for 4-6 months postnataly

- ▶ Heparin is the anticoagulant of choice in pregnancy. It does not cross the placenta and in overdose action can be reversed by protamin sulphate
- ▶ Osteoporosis & thrombocytopenia are complications of prolonged heparin treatment. Therefore platelet count should be monitored regularly

- ▶ Legs should be elevated & graduated elastic compression stocking should be worn to reduce oedema
- ▶ In DVT, calf circumference should be measured daily to help monitor the response to treatment
- ▶ Massive PE requires ICU & multi-disciplinary team approach
- ▶ Recurrent PE may require inferior vena cava filter

- ▶ Thrombolytic therapy in PE should only be given with haematologist agreement
- ▶ Thoracotomy with embolectomy may be life saving
- ▶ Heparin thrombo -prophylaxis has to be considered in the subsequent pregnancies or if additional risk factors appear

# Oral anticoagulants

- ▶ Cross the placenta and are potentially teratogenic at any stage of pregnancy
- ▶ Complications of warfarin includes, nasal hypoplasia, depressed nasal bridge, irregular bone growth & intracranial fetal haemorrhage
- ▶ However , they can be given after delivery and are safe for lactation

# conclusion

- ▶ Thrombo-embolism is a major cause of maternal mortality & morbidity worldwide
- ▶ Clinical diagnosis is unreliable but once strongly suspected, treatment should be started until objectively excluded
- ▶ Duplex Doppler, x-ray venogram & V/Q scan are the main diagnostic tools

- ▶ During pregnancy, LMWH is the preferred anticoagulant as it is more effective and safer than standard heparin
- ▶ Oral anticoagulants should not be given at any stage during pregnancy but they are safe & may be more convenient after delivery
- ▶ High clinical suspicion with early full anticoagulation and objective diagnosis are the best ways to minimize maternal M&M and avoiding risks of the unnecessary treatment