

Thromboembolic disease in pregnancy

Lecture objectives

By the end of this lecture, student is expected to
Know

- The implication of thrombo-embolic disease(TED) on pregnant women
- Why pregnancy is associated with increased tendency for clotting
- Risk factors for TED
- Clinical Symptoms & signs of DVT and diagnostic difficulties

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- **Types of DVT**
 - **Diagnostic tests**
 - **Treatment of acute phase DVT & subsequent management**
 - **Clinical presentation of pulmonary embolism, symptoms & signs and confirmatory lab tests**
 - **Management of PE**
 - **conclusion**

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 (≥ 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 pregnancy

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)

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- 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

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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

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- 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

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- 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

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- **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**

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- 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