DISSEMINATED INTRAVASCULAR COAGULATION

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Definition

- DIC - is a thrombo- haemorrhagic disorder
  - due to abnormal activation of the coag. cascade
  - seen in asso. with well defined clinical situations.

Etiology – DIC seen in following clinical situations :

Abruptio placentae
Amniotic fluid embolism
Retained intrauterine dead fetus
Sepsis and endotoxic shock
Severe pre-eclampsia and eclampsia
Induced abortion, especially using hypertonic saline
Acute fatty liver of pregnancy
Molar pregnancy
Excessive blood loss & shock due to any cause

Pathophysiology

Pregnancy is a hyper coagulable state – Why ?

1. In normal pregnancy there is an ↑ in clotting factors like VII, VIII IX, X and fibronogen

2. Inhibition of the fibrinolytic system

3. Natural anti coag.like anti thrombin III

Protein C
Protein S
} are reduced

Pathogenesis - Simplified

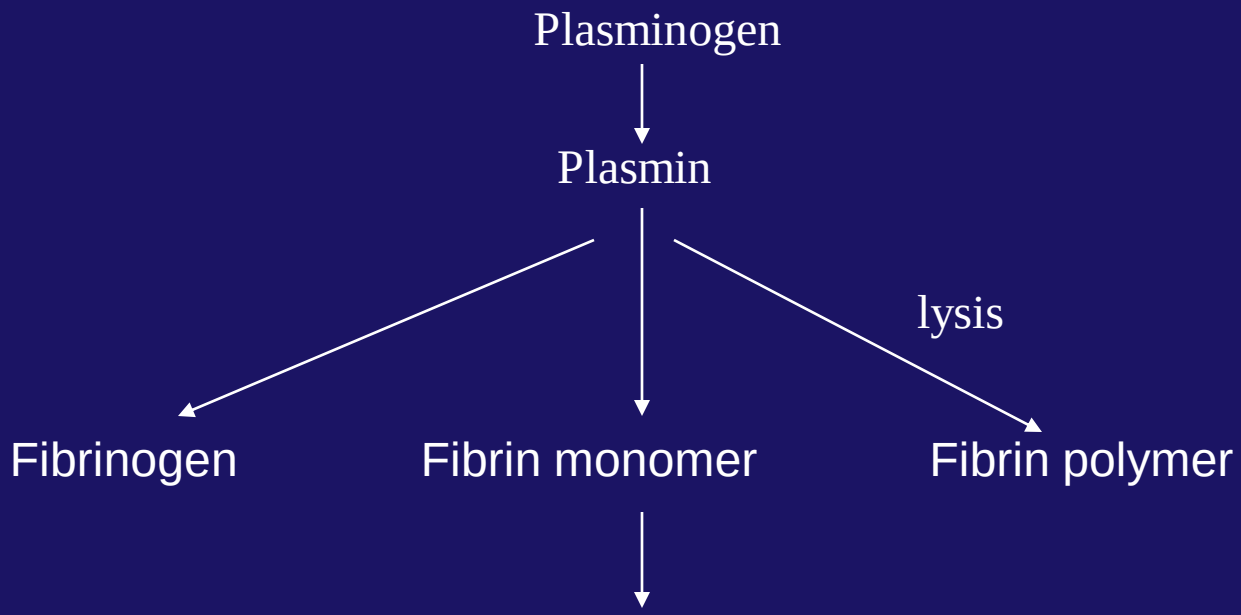
Intrinsic pathway	Extrinsic pathway
Triggered where ever there is loss of endothelial integrity	Triggered by tissue destruction Eg: In abruptio & IUD Thromboplastin is liberated from the placenta & dead fetus In septicaemia bacterial endotoxins activate the extrinsic clotting system

Pathogensis

- DIC occurs when fibrin gets deposited in the small vessels of virtually every organ in the body. Consumptive coagulopathy results due to consumption of coagulation factors and platelets

Pathogenesis contd.,

Fibrinolytic sys. gets activated in response to fibrin deposition



Diagnosis

1. Persistent bleeding from venepuncture sites , surgical wounds.
2. Bleeding from episiotomy incisions, perineal lacerations
3. Bleeding gums and nose
4. Blood stained urine -haematuria

Investigations
Bed side tests

Clotting time or CT

This is a useful bed side test

Take 5ml of blood in a glass tube

If a clot forms in 10mts & remains firm it is unlikely that the pt has a DIC & also means that the fibrinogen levels are normal.

Bedside test

- Clot retraction time- Is an other bed side test wherein the clot retracts at the end of 1 hour. This means that the platelets are adequate.

Bedside test

- Clot stability is indicated when a stable clot forms .A fragile or unstable clot indicates presence of FDP and hence it gets lysed.

Investigations

- Prothrombin time P.T. 11-16 secs (extrinsic pathway)
- Partial thromboplastin time 30-45 secs(intrinsic pathway)
- Serum fibrinogen 300- 600mg% (<100-severe hypofibrinogenaemia)
- Platelet 1.5 …3.5L (decreases as it is consumed)
- D.Dimer <0.5mg/L (increases when FDP levels increase)
- Fibrinogen degradation products <10micro/dl (DIC unlikely with normal FDP)

Interpretation

- Increased
  - PT
  - APTT
  - FDP
- Decreased
  - Platelets
  - Fibrinogen

No single test establishes the diagnosis of DIC

Serial clotting assays are more useful

Therefore repeat coagulation tests after 6-8hours

The three corner stones In the Management of DIC

- Correct the underlying problem
- Maintain circulating blood volume
- Replace clotting factors & red blood cells

Correct the underlying problem

- Management of underlying cause –

  Eg:- in case of abruptio , prolonged retention of dead fetus and HELLP syndrome immediate delivery is indicated

Maintain circulating blood volume

First priority is to replace intravascular compartment

1. Opt for colloids (starch - haestrel 3.5%, voluven 6%) (Avoid dextran as it interferes with subsequent cross match)

2 If crystalloids give 3 times est. blood loss (eg: for 1 litre blood loss give 3 litres of normal saline or ringerlactate)

Replace blood volume

- The only indication for whole blood transfusion is MASSIVE Obst. hge
- Only give **fresh blood** - as stored blood is deficient in all labile clotting factors and platelets

  (Hb takes about 24-72 hours to reach a constant after transfusion . Therefore check accordingly)

Fresh frozen plasma - FFP

- Contains labile and stable clotting factors including fibrinogen
- Dose 10-15ml /kg body wt (ie 3-4bags of FFP)
- 1 unit of FFP(200-250ml) ↑fibrinogen by10mg/dl
- It has a shelf life of 1 year when properly stored.
- Thaw before use .

Cryo precipitate

- Cryo ppt. is rich in fibrinogen and factor VIII ,XIII and V
- Each unit cryo ppt increases fibrinogen by 10mg/dl
- It may be necessary to give about 10-15bags of cryo ppt at a time

Platelet transfusion

- Platelet rich plasma are given
- One bag of platelets raises count by 5000-10000
- Indicated when platelet count is below 50,000/cc and when surgical intervention is required.
- For a vag. delivery less than 20,000 platelets will do
- Anti D should be given after a platelet transfusion

Recombinant VII a

(Nova- 7)

- Enhances both thrombin generation at the site of injury & platelet aggregation and adhesion
- Only indicated in massive , intractable haemorrhage when other measures fail.

- Activated protein C – tried in severe sepsis associated with DIC

Anesthesia & Surgery in DIC

- Correct the coagulation abnormality
- Avoid regional anesthesia
- Use vertical incisions
- Put in drains where required before completion


Thank You!