



**January 2012**

**Patient Case:** Mary age 28 years, gravida 3 was admitted to the Birthing Centre at 38 weeks gestation for an elective Caesarean Section due to placenta previa. Her blood group is O Rh Negative; she received Rh Immune Globulin injection at 28 weeks gestation. Her C-section was uncomplicated with an estimated blood loss of 1000 mL. Post-procedure, she developed heavy vaginal bleeding and became hypotensive. Initially 2 units packed red blood cells (PRBC) were transfused. The brisk bleeding continued; the Obstetrical team activated the [Massive Transfusion Protocol](#). Over the next 4 hours Mary received a total of 16 units PRBC, 10 units plasma and 2 doses platelets. Retained placenta is suspected; continued blood transfusion support is required.

**QUESTION 1** Disseminated Intravascular Coagulation (DIC) is questioned. Which lab test is important in diagnosing DIC: (choose all that apply)

- a. Hemoglobin
- b. INR / PTT
- c. Platelet count
- d. Fibrinogen
- e. Ionized Calcium

**QUESTION 2** Mary's fibrinogen level is 0.7 g/L. Which blood product would provide the highest concentration of fibrinogen?

- a. Platelets
- b. Plasma
- c. Cryoprecipitate
- d. Prothrombin Complex Concentrates (Octaplex or Beriplex)
- e. Fibrinogen Concentrate

Mary is taken to the Operating Room to investigate the uncontrolled bleeding. Dilatation and curettage (D&C) was performed, hysterectomy was avoided. She is transferred to CCTC in stable condition. Mary received in total 26 units PRBC, 20 units plasma, 4 doses platelets and 10 units of cryoprecipitate.

**QUESTION 3** Cord blood on Mary's baby is A Rh Negative.

TRUE or FALSE: Mary received Rh Immune Globulin at 28 weeks gestation and therefore should also receive another dose post-delivery?

- a. TRUE
- b. FALSE

**ANSWERS:** 1 (a), (b), (c), (d)  
2 (c)  
3 (b)

## DISCUSSION:

### Disseminated Intravascular Coagulation (DIC)

DIC is a thrombo-hemorrhagic disorder.

- Proteins that control blood clotting become abnormally active resulting in THROMBOSIS. This causes a depletion of both platelets and coagulation factors, leading to an increased risk of HEMORRHAGE
- DIC is often activated by the release of Tissue Factor and is a complication of underlying illness. Common causes include:
  - Sepsis
  - Trauma and tissue destruction
  - Cancer
  - Obstetrical complications (Placenta is very rich in Tissue Factor)
- DIC results in decreased fibrinogen levels (fibrinogen has been converted to fibrin due to the continued activation of the coagulation cascade). Fibrinogen levels should be monitored through-out all massive bleeding situations. Low fibrinogen levels (less than 1.0 g/L) should be reported to the Attending Physician immediately.
- INR and PTT will be prolonged and the platelet count will be decreased. Additional blood product support is frequently necessary.

For further information refer to: [Disseminated intravascular coagulation during pregnancy](#) (Ramin SM, Ramin KD)

**Cryoprecipitate** is a source of concentrated fibrinogen (150 mg per unit). The usual adult dose is 10 units. Plasma also contains fibrinogen. Approximately 1000 mL of plasma is required to provide fibrinogen equivalent to approximately 60 mL of cryoprecipitate. At this time, Fibrinogen Concentrate is not readily available in Canada (requires Special Access Program). CSL Behring's [RiaSTAP](#) (Fibrinogen Concentrate) is currently under review and is anticipated to be accessible through the Canadian Blood Services in the near future.

**Rh Immune Globulin (Rhlg)** is often referred to as RhoGam® (Ortho), however in Canada the brand name is [WinRho®](#) (Cangene). Rhlg is given to Rh negative females of child bearing age to prevent sensitization to the D antigen and the formation of anti-D. Anti-D can cause severe hemolytic disease of the newborn and can be prevented by administering Rhlg each time there may be a possible sensitizing event (Rh positive red blood cells entering an Rh Negative female's circulation). This would include the following scenarios:

- At 28 weeks gestation
- Following delivery **if** baby is Rh Positive
- Miscarriage/abortion (including threatened abortion)
- Following amniocentesis
- Following transfusion of Rh positive platelets (RBCs)

For additional information on Rhlg, please see the [Blood Transfusion Resource Manual](#).