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Should a test for fetomaternal hemorrhage (FMH) be done before administering Rh Immune Globulin to Rh-negative women at risk of FMH in early pregnancy?

A transfusion medicine physician in Wisconsin reports that one of their hospital systems is in the process of reviewing and rewriting their RhIG workup procedure for Rh negative mothers who are not alloimmunized to the D-antigen (for both antenatal and postpartum immunoprophylaxis). Currently, they evaluate for excessive fetomaternal hemorrhage during the postpartum and antenatal period (e.g. with any procedure, abdominal trauma, or abortion that could result in fetal cells entering the maternal circulation) when the mother is greater than or equal to 20 weeks estimated gestational age (EGA). To assist in standardizing the procedure among the various hospitals within their health care system, they are considering an EGA as early as 13 weeks for assessing fetomaternal hemorrhage following a procedure, abdominal trauma, or abortion that could result in fetal cells entering the maternal circulation. The rationale for the current antenatal cutoff of 20 weeks EGA (established a few years ago) is based on an ASCP Practice Parameter - Use of Rh Immune Globulin (Am J Clin Pathol 1998;110281-292) and a 1999 UK Blood Transfusion Services Recommendations (Transfusion Medicine 1999;993-97). Both of these references cite a study by Nicolaidis et al. where estimates of fetoplacental blood volume were measured on fetuses of 18-31 weeks gestation undergoing intrauterine transfusions for erythroblastosis fetalis. At 20 weeks EGA, the best estimate of fetoplacental blood volume was 30 ml (range 20-65 ml; 9 procedures) and at 18 weeks EGA the best estimate was 25.9 ml (range 15-40 ml; 4 procedures). The Wisconsin physician's concern is that they could be missing excessive fetomaternal hemorrhage in some mothers who are less than 20 weeks EGA, albeit rarely, if the current cutoff to detect fetomaternal hemorrhage is not adjusted from 20 to 13 weeks. They would like to know at what minimal gestational age other colleagues have established for performing a screen for fetomaternal hemorrhage in Rh negative mothers during the antenatal period.

The following replies were submitted in response to the above query

1. **A Texan** reports that her lab does NOT do a fetomaternal hemorrhage detection test unless a woman is at least in her 28th week of pregnancy at the time of a miscarriage or other risk of fetomaternal hemorrhage. (The Texas policy is quite different from the Wisconsin policy described above.) She also comments that the 14th edition of the AABB Technical Manual (page 509) states that "If pregnancy in a D-negative woman terminates before 13 weeks of gestation, a 50 ug dose of RhIG would be adequate to protect against the small fetal blood volume during the first trimester." However, when the Texan's lab dispenses RhIG, they never use a 50 ug dose. The Texan's lab dispenses a 300 ug dose for every abortion of a D-negative woman, no matter the gestational age up to 28 weeks. After 28 weeks gestation, if a risk of fetomaternal hemorrhage exists, fetomaternal hemorrhage is detected using a Rosette test, which if positive is followed by a Kleihauer Test to determine if additional vials of RhIG are necessary.

ADDENDA Oct. 23, 2002

2. **Some ER/trauma physicians at a responding Californian's facility** (a Level I trauma center) order FMH testing in cases of trauma to pregnant patients regardless of Rh status in order to determine the extent of trauma to the patient/fetus and if intervention is needed. Do other physicians out there do this? This presents a logistic problem if lab techs apply reflexive testing to only do FMH testing if the patient is Rh negative.

ADDENDA Oct. 7, 2005

3. **A colleague in a Sunbelt State** wants to know what policy/practice others follow when screening blood of pregnant women for fetal red cells after the **20th week of gestation**. She comments that according to the 23rd edition of AABB *Standards* 5.20.3 "There shall be a process to ensure that an adequate dose of Rh Immune Globulin is administered" and according to the 15th edition of the AABB Technical Manual (page 549) "at < 20 weeks, the fetal blood volume is rarely more than 30 mL, small enough that a single dose of 300 ug RHIG will be sufficient for prophylaxis for any fetomaternal hemorrhage."

maternal hemorrhage. Therefore it is not necessary to quantitate fetal red cells in the maternal circulation before 20 weeks of gestation." She reports that her institution does not perform screening on maternal blood for fetal red cells for women who require RHIG **before the 28th week of gestation**. She wonders if her institution should change its policy to screen maternal blood for fetal red cells for all ante-natal RHIG recipients who are at or beyond their 20th week of gestation.

ADDENDA Oct. 26, 2005

4. In the addenda of Oct. 23, 2002 ([above](#)) some ER/trauma physicians at a Californian facility (a Level I trauma center) reported that they order Fetal-Maternal Hemorrhage (FMH) testing in cases of trauma to pregnant patients, regardless of her Rh status **to determine the extent of trauma to the patient/fetus, and to determine if intervention is needed**. They wonder if other institutions employ a similar strategy, since such an approach could present a logistical problem, if laboratory technologists apply reflexive testing to only do FMH testing if the patient is Rh negative. In response, a **Blood Bank Supervisor in Colorado** reports that her level II trauma center has established a **"pregnant patient trauma panel" which includes a Kleihauer-Betke workup for FMH detection and quantification**. They implemented this panel for the same reasons stated by the Level I trauma center facility in California. Their panel also includes a type and screen.

ADDENDA Oct. 28, 2005

5. **A transfusion service supporting a Level 1 Trauma Center in the San Diego area routinely receives Kleihauer-Betke requests for pregnant trauma patients**. Since the majority of the Kleihauer-Betke stains that they perform are on Rh positive patients, they have used "rules" in their LIS system for reporting this test. An Rh type is required. If the patient is Rh negative, the system automatically calculates a recommended dosage of Rh Immune Globulin in addition to an estimate of the volume of fetal-maternal hemorrhage. If the patient is Rh positive the dosage of Rh Immune Globulin is not reported, but the volume of fetal-maternal hemorrhage is.

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Posted: October 22, 2002

Addenda: Oct. 23, 2002; Oct. 7, 26 & 28, 2005