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Care bundles for management of obstetrical hemorrhage

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ABSTRACT

Peripartum hemorrhage is one of the most preventable causes of maternal mortality worldwide. Much effort has been directed toward creating programs that address deficits in maternity care responsible for preventable hemorrhage-related morbidity and mortality. To have a significant impact on outcomes, such programs must address both providers and processes involved in the delivery of maternity care. At the core of a successful program, are standardized care bundles integrating medical and surgical techniques for managing hemorrhage with principles of transfusion medicine and critical care. In this article, we review the components of the safety bundle for obstetric hemorrhage developed by ACOG District II Safe Motherhood Initiative.

Introduction

Peripartum hemorrhage continues to be a major contributor to maternal morbidity and mortality. Over the last 10 years, the incidence of PPH and transfusions (including that of massive transfusion) has increased considerably.[1,2] Most reviews of maternal mortality from hemorrhage suggest that the majority of these cases are preventable.[3–5] A comprehensive protocol addressing the issue of accurate and realistic diagnosis, as well as timely and adequate interventions, is likely to have a positive impact on the morbidity and mortality associated with this obstetrical complication.

Approximately 2 years ago, a group of Obstetricians and Gynecologists in NYS under the leadership of ACOG District II launched a patient safety initiative to address several clinical entities responsible for maternal morbidity and mortality (Safe Motherhood Initiative). One of the three clinical entities chosen for this intervention was peripartum hemorrhage. The group was multidisciplinary in nature, including maternal–fetal medicine specialists, obstetricians and gynecologists, obstetrical nurses, certified nurse midwives, and anesthesiologists. During regular meetings, we build a consensus around the major elements of a standardized clinical protocol concerning the diagnosis and management of peripartum hemorrhage.

Elements of the standardized clinical protocol for peripartum hemorrhage are as follows:

- Risk assessment and measures to modify that risk
- General (universal) preparations for managing any PPH episodes
- Diagnosis
  - Establish a more objective process for measuring blood loss
  - Define the stages of hemorrhage based on the clinical consequences of blood loss
- Management algorithms
- Logistics and communication

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- Hemostatic intervention
- Replacement therapy

Risk assessment

Ideally, risk assessment for peripartum hemorrhage, should start in the antepartum period to allow time for diagnosis and delivery planning. Although all women should be considered at risk for hemorrhage, further classification into medium and high risk allow for targeted interventions. Examples of antenatal interventions include treatment of maternal anemia, diagnosis of abnormal placentation, and management of coagulopathies. Advance planning and multidisciplinary coordination of care is needed to minimize the risk of life threatening hemorrhage and increase the margin of safety for patients with these conditions. The most common conditions that benefit from such interventions in the antepartum period are:

- Placenta previa
- Placenta accreta
- Previous classical cesarean section
- History of myomectomy
- Refusal of blood transfusion
- Bleeding disorder
- Current anticoagulation (therapeutic)
- Significant cardiopulmonary and hematologic morbidities

For patients with prior uterine surgery and abnormal placentation, the most critical element in management is timing the delivery before the onset of labor. In such cases, the risk of neonatal prematurity is outweighed by the significant risk of profound maternal hemorrhage should labor occur spontaneously. The group's recommendation in this regard is entirely consistent with ACOG guidelines concerning these entities.[6]

Condition for which timing of delivery is critical

Placenta accreta	$34^{0/7}$–$35^{6/7}$ weeks
Placenta previa	$36^{0/7}$–$37^{6/7}$ weeks
Prior classical C/S	$36^{0/7}$–$37^{6/7}$ weeks
Previous myomectomy	$37^{0/7}$–$38^{6/7}$ weeks
If extensive	$36^{0/7}$–$37^{6/7}$ weeks

In addition, for patients with placenta accreta, transfer to a facility for delivery that has the resources to manage such complex cases is critical. Those include blood bank resources, experienced surgical support, anesthesia resources, the ability to provide vascular embolization, urology services, and critical care support.

Blood transfusion acceptance

Another category of high-risk patients that benefit from antenatal discussion are those refusing blood transfusions. It is important for the provider to discuss and document which specific replacement products are acceptable to the patient in the event of hemorrhage. We suggest using a blood product acceptance list that can be completed and signed by the patient in the antepartum period (Table). Some patients, such as those with religious objections, are familiar with the various products, but others are unfamiliar and require detailed counseling. It is best to introduce such discussions privately between the patient and the physician, and include family members only if requested by the patient. The discussion should address the surgical measures that can be anticipated if hemorrhage occurs, including need for hysterectomy. This is especially critical for these patients as the decision for surgical intervention here should be made earlier in the course of bleeding compared with patients who will accept transfusion. If the blood transfusion acceptance form has not been completed in the antepartum period, it should be accomplished upon admission to Labor & Delivery.

It is also preferable to identify patients that refuse blood products in the antepartum period, so that hemoglobin can be optimized (with oral or intravenous iron) well before admission for delivery. Patients with inherited or acquired coagulopathy as well as those who are fully anticoagulated are best co-managed with hematology and/or Maternal–Fetal Medicine, and their coagulation status carefully monitored in the peripartum period.

General (universal) preparations

Optimal care of the high-risk patient involves an organized team approach, so it is important that team members (obstetrician, anesthesiologist, nursing, neonatology, etc.) are aware when a high-risk patient is admitted to Labor & Delivery. One effective method of standardizing such communication is the Perinatal Huddle, which enhances situational awareness and allows team members to prepare for potential hemorrhage and develop an organized management plan. The exchange of clinical information that occurs with the Perinatal Huddle has become more valuable given the increasing frequency of provider cross coverage in obstetrical care. As part of general measures, women who are at high risk for peripartum hemorrhage should have a type and cross-match submitted on admission to L&D.

Familiarity with blood bank protocols

It is important to be familiar with the institution's blood bank protocols to respond to peripartum hemorrhage in an adequate and timely manner. Collaboration between Obstetrics and Transfusion Medicine (blood bank) to develop guidelines for blood product replacement is mutually beneficial. Such guidelines must address the following key elements critical for successfully managing obstetrical hemorrhage:

- Emergency blood release
- Massive transfusion protocol (MTP)
- Hemorrhage cart/medical kit
- Hemorrhage team (different then the primary team)

Emergency blood release

Unanticipated hemorrhage can occur before the availability of cross-matched blood. Under these circumstances, emergency