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FOCUSED REVIEW ARTICLE

CME

Caring for the Jehovah's Witness Parturient

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Caring for the Jehovah's Witness parturient is a complex task that presents a number of ethical, medical, and legal concerns because many Jehovah's Witnesses refuse allogeneic blood transfusion. Childbirth and its surrounding events may be associated with significant blood loss. Given their significant role in the intraoperative administration of blood products, anesthesia providers should be familiar with factors that must be considered in the perioperative care of Jehovah's Witness parturients. Several pharmacologic therapies, anesthetic techniques, and operative interventions aimed at blood conservation may be useful in the care of such patients. Aside from their refusal of transfusion, each Witness makes a personal decision on the acceptability of derivatives of plasma or cellular blood components and autologous blood management. Therefore, the patient–physician relationship must ensure that the individual patient's desires are accurately communicated, respected, and documented in the patient's medical record. The Perioperative Surgical Home model is appropriate for use in caring for Jehovah's Witness patients because it allows for the early and continuing coordination of care and communication between the patient and a multidisciplinary team. In this article, we present a focused review of concepts important to the provision of anesthetic care of parturients who are Jehovah's Witnesses and introduce an algorithmic perioperative approach that may be applied to the care of the Jehovah's Witness parturient undergoing an operative procedure. (Anesth Analg 2015;121:1564–9)

Jehovah's Witnesses are known to the medical community for their refusal of allogeneic blood transfusion. Their membership is estimated to be >7.9 million people worldwide, including approximately 1.5 million in the United States.[1] Jehovah's Witnesses consider blood transfusion to be a direct violation of God's law and reject transfusion of primary blood components (whole blood, packed red cells, white cells, platelets, and plasma).[2] The Witnesses' refusal of blood products is based on their literal understanding of several biblical passages (Genesis 9:3–4; Leviticus 17:10–16; Acts 15:19–29) that view blood as sacred and holy, thereby prohibiting its intake in any form, including transfusions. Jehovah's Witnesses believe that anyone who willingly receives blood in this way breaks divine law and forfeits any hope of achieving eternality. Furthermore, those who are unrepentant for their action may undergo ostracism and excommunication from the organization. Some cellular and plasma derivatives (hemin, hemoglobin-based blood substitutes, interferons, interleukins, albumin, immunoglobulins, clotting factors, and wound healing factor) may be acceptable as "conscience" items (i.e., the individual Witness can decide on the matter based on a review of their conscience; Fig. 1).[3]

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The view toward allogeneic and autologous blood transfusion is not uniform and may differ among Witnesses. Although most refuse allogeneic blood transfusion and preoperatively stored autologous blood, they accept almost all other forms of medical treatment.[4]

Jehovah's Witnesses recognize the complexities to medical management that their religious practices present. Their dedication to establishing cooperative and communicative relationships among medical institutions, legal entities, and themselves is manifested in their creation of >1700 Hospital Liaison Committees worldwide.[5,6] The Hospital Liaison Committees network is coordinated by Hospital Information Services at the International Office of Jehovah's Witnesses (+1 718-560-4700 or his@jw.org).[6] (Physicians in the United States may contact the U.S. office at +1 718-560-4300 or his.us@jw.org.) The network was established by Jehovah's Witnesses and provides an information and referral service for physicians to facilitate access to health care for Witness patients. The network serves as an authoritative source of information regarding the Witnesses' religious beliefs as they relate to medical practice, disseminates information from mainstream peer-reviewed medical journals regarding clinical strategies to avoid blood transfusion, and can arrange consultations with clinicians who are experienced in treating patients without allogeneic blood.

ETHICAL AND LEGAL CONCERNS

The competent adult patient has the right "to receive sufficient information to make an informed choice about the treatment recommended" and "may choose to accept or to decline the physician's recommendation."[7] Jehovah's Witnesses' refusal of blood transfusion is a constitutionally protected right that has been recognized by the U.S. Supreme Court and statutory provisions. The right of the competent adult patient to refuse treatment was first established in the

NOT ACCEPTABLE *Primary Blood Components*	PERSONAL DECISION *"Conscience" Items*	ACCEPTABLE ALTERNATIVE TREATMENTS
Whole blood	Cell salvage Hemodilution Hemodialysis Cardiopulmonary bypass	Hematopoietic agents (Iron, folate)
Packed red cells	Red cell fractions (Hemoglobin based blood substitute, Hemin)	Antifibrinolytic agents (Desmopressin, Tranexamic acid)
White cells	White cell fractions (Interferons, interleukins)	Topical hemostatic agents (Surgicel, Gelfoam, Avitene, Oxygel)
Plasma	Plasma fractions (Albumin, immunoglobulins, clotting factors)	Anesthetic techniques (Deliberate hypotension, deliberate hypothermia)
Platelets	Platelet fractions (Wound healing factor)	Surgical devices and techniques (Electrocautery, embolization, Ligasure vessel sealing, argon beam coagulation)
	Hematopoietic agents (Recombinant erythropoietin*)	
	Natural clotting factors (Prothrombin complex concentrate, Factor VIIa concentrate)	

*Recombinant erythropoietin, a hematopoietic agent, is listed in the "Personal Decision" column, because many common formulations are buffered with albumin and may be refused by Jehovah's Witness patients.

Figure 1. Based on a table created by Northwestern Memorial Hospital Medical Ethics Committee. Basic position of Jehovah's Witness on blood transfusion and acceptable alternative treatments. *Recombinant erythropoietin, a hematopoietic agent, is listed in the "Personal Decision" column because many common formulations are buffered with albumin and may be refused by Jehovah's Witness patients. Reproduced with permission from Cynthia Barnard, Director, Quality Strategies, Northwestern Memorial Hospital, Chicago, IL.

landmark case, *Schloendorff v. Society of New York Hospital*, in 1914.[8] Many case laws have since reinforced this right, including the *Roe v. Wade* decision in 1973.[9] The medical community has long endorsed this principle.[10]

Recent court views (Harrell and Fetus Brown) have ruled that the competent pregnant woman must be allowed to refuse blood transfusion.[11–13] The fundamental right of bodily self-determination must still be honored in the care of the competent pregnant woman. In situations in which blood is refused by the parturient, diligence should be exercised to ensure that the patient's position has been clearly expressed verbally and in writing. Many Witnesses communicate their wishes using preformatted advance health care directive wallet cards (e.g., Durable Power of Attorney, Health Care Proxy, Power of Attorney for Health Care). Because the legal requirements for advance directives vary from state to state, Witness patients generally execute the advance directive prepared for their state of residence. These advance directives are helpful to both patients and physicians because they allow Jehovah's Witnesses to clearly delineate their individual decisions regarding which derivatives of plasma or cellular components and/or blood conservation strategies are acceptable. Some institutions may elect to have additional consent forms for patients who refuse blood transfusion. At the authors' hospital, a consent form is used that requires the signatures of 2 designated adult members of the patient's choosing. This form releases the healthcare providers and the institution from liability (Supplemental Digital Content 1, http://links.lww.com/AA/B186). If there is uncertainty regarding the voluntariness of the parturient's statements, she should be privately interviewed in a respectful and noncoercive manner to confirm that she is making decisions without undue influence. Given the complexities involved and variation among Witness patients, it is of paramount importance that the Jehovah's Witness parturient clearly make known her wishes regarding what she can conscientiously accept should massive hemorrhage occur and blood transfusion would ordinarily be considered.

Physicians must always be mindful of principles of medical ethics and act in the patient's best interest. While honoring the patient's rights to autonomy and freedom of religious practice, physicians must adhere to the "Hippocratic Oath" that instructs them to "apply, for the benefits of the sick, all measures which are required."[14] The physician's desire for nonmaleficence and beneficence may conflict with patient autonomy and societal justice.[15,16] Physicians must disclose any risks associated with refusal of a potentially life-saving medical therapy and offer counsel regarding acceptable alternative treatment strategies and the capability of the healthcare facility to provide them (Supplemental Digital Content 2, http://links.lww.com/AA/B187). The physician

must be cognizant of the Jehovah's Witnesses' beliefs and views regarding blood transfusion and take time to engage in nonjudgmental dialogue with the patient. In particular, the Jehovah's Witness patient should be informed that currently there are no U.S. Food and Drug Administration-approved blood substitutes, and only red blood cells have the capacity to transport oxygen. An accurate and detailed documentation of this patient education dialogue, including who was present, risks/benefits/alternatives that were discussed, and the patient's decision regarding "minor fractions" and interventions, should be noted in the patient's medical record.

Physicians must respect the patient's decision regarding the plan of care even in dire circumstances. If the patient becomes incapacitated but has an advance directive with documented decisions, no one, including family members, can change the documented treatment plan. If the incapacitated patient has no advance directive, then the family member or person with the Power of Attorney must make healthcare decisions in harmony with the patient's known wishes (i.e., what the patient would want if she could make the decision). A physician "cannot be held to have violated his/her legal or professional responsibilities when he/she honors the right of a competent adult patient to decline medical treatment."[17] Conversely, physicians may be held liable and lay themselves open to legal action by the patient if they fail to respect the competent parturient's choice to refuse blood transfusion. Physicians and healthcare institutions have been successfully challenged in the judicial system where courts have repeatedly upheld the adult Witness patient's right to refuse blood transfusion. In some circumstances, monetary compensation was awarded to patients.[18] For emergency situations wherein the patient's wishes are not known, there is no advance directive present, and there is no time to secure an informed consent, physicians may be permitted to administer treatment as indicated to save life. In urgent situations in which the patient is unconscious or mentally incompetent and the position regarding alternative treatment to blood is unclear or there is no consensus among family members, best practice favors that physicians seek guidance from the hospital's ethics committee and legal advisors regarding appropriate action to be taken.[19,20] It should be noted that the physician has the right to terminate the doctor–physician relationship by transferring patient care to another physician who is willing to treat the patient according to her wishes.[10]

MANAGEMENT CONSIDERATIONS

Multidisciplinary Communication and Coordination of Care

Figure 2 presents an algorithmic approach to the perioperative care of Jehovah's Witness parturients. Communication between the patient and a multidisciplinary team (comprising anesthesiologist, obstetrician, other surgeons, blood-banking specialist/pathologist/hematologist, interventional radiologist, neonatologist, nurses, and support personnel) must be established early and maintained throughout the labor and delivery period. Use of a Perioperative Surgical Home model as described by the American Society of Anesthesiologists is beneficial in achieving the coordination of care necessary to ensure that an appropriate plan of care is developed early and understood by all parties.[21] The Perioperative Surgical Home model is a "patient-centered and physician-led multidisciplinary and team-based system of coordinated care that guides the patient throughout the entire surgical experience, from decision for the need for surgery to discharge from a medical facility."[21] The use of this model may offer many benefits to meet the unique needs of this patient population such as encouraging multidisciplinary discussion early in the antepartum period that clearly delineates the patient's wishes regarding acceptable therapy. Furthermore, regularly scheduled communication may be continued throughout the entire peripartum period, thereby allowing for the provision of seamless coordinated care among the multidisciplinary team and ensuring ample time to initiate effective pharmacologic and dietary therapies.

Pharmacologic Therapies

Pharmacologic therapies should be considered when caring for patients who refuse blood transfusion. High-dose recombinant erythropoietin in combination with supplemental iron and folate has been used effectively in Jehovah's Witness patients during pregnancy and the postpartum period to enhance hemoglobin synthesis.[22–25] Several case reports demonstrate increases in hemoglobin levels and avoidance of blood transfusion associated with erythropoietin use during pregnancy.[22–25] A 2013 literature review comprising 10 years of erythropoietin use in pregnancy suggests that it is safe to use in this setting; there have been no reported occurrences of maternal or fetal morbidity or mortality associated with its use.[26] Although erythropoietin's use in this manner is gaining popularity, there is little information regarding optimal dosing and dosing intervals for its use in anemic patients without renal disease. Clinicians should be aware that erythropoiesis-stimulating agents may increase the risk of thrombosis.[26] Given that pregnancy is a hypercoagulable state, it seems prudent to carefully weigh the potential benefits versus risks when considering their use in this setting.

Desmopressin, a synthetic analog of vasopressin that releases endogenous von Willebrand factor from the endothelial cells, has been reported in the care of Jehovah's Witnesses experiencing severe coagulopathy.[27]

Antifibrinolytic agents may be considered in this setting because their use has been associated with reductions in perioperative transfusion requirements. Both tranexamic acid and ε-aminocaproic acid have been effectively used as hemostatic agents without the adverse effects on renal function that have been reported with aprotinin. The efficacy and safety of tranexamic acid in reducing blood loss after elective cesarean delivery have been demonstrated in several clinical trials.[28–30] Prothrombin complex concentrate, an alternative to fresh-frozen plasma, is a commercially available factor concentrate that may be considered in massive hemorrhage. One report describes its use with cryoprecipitate and vasopressin to control bleeding in a Jehovah's Witness patient undergoing repeat aortic valve replacement.[31] There are also case reports describing the use of recombinant factor VIIa in conjunction with

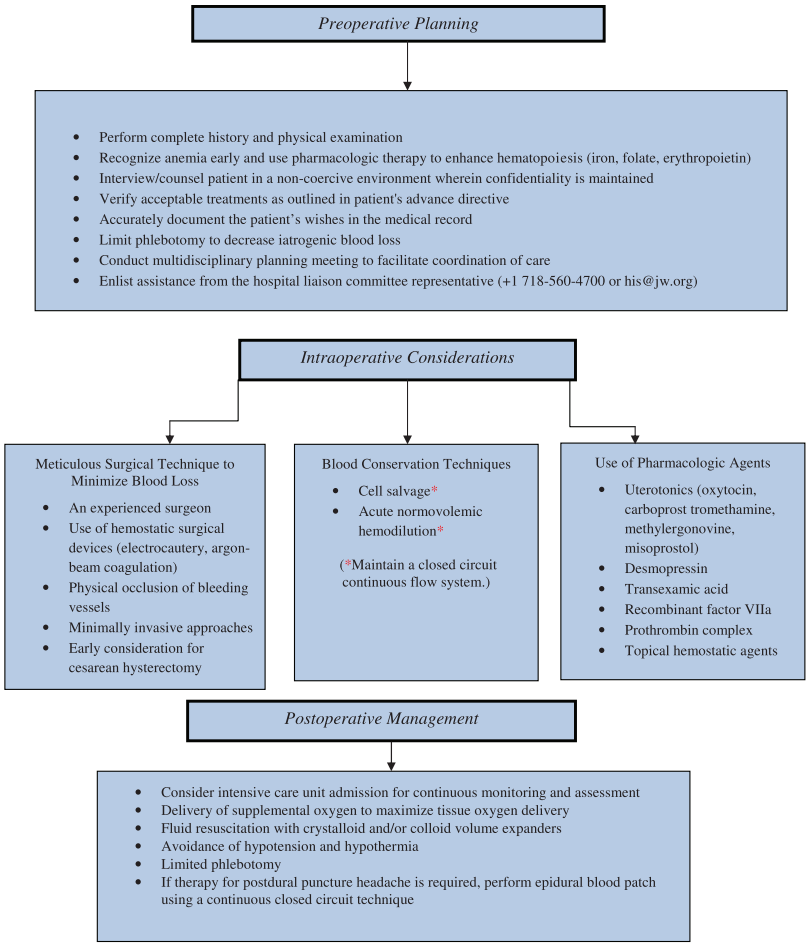

Figure 2. A suggested algorithmic perioperative approach to care of the Jehovah's Witness parturient preparing to undergo an operative procedure.

tranexamic acid to treat Jehovah's Witness patients in the setting of dilutional coagulopathy caused by massive hemorrhage.[32,33]

Blood Conservation Techniques

Some Jehovah's Witnesses may consent to the use of acute normovolemic hemodilution and blood cell salvage, viewing them as extensions of their circulatory system. Other Witnesses might require that the withdrawn blood be maintained in a circuit that is in continuous contact with their body.[34,35] In acute normovolemic hemodilution, whole blood is removed from a patient immediately before surgery with concurrent blood volume replacement with either crystalloid or colloid solutions to maintain isovolemia. Its use in Jehovah's Witness parturients has been described in several obstetric cases.[36–38] Studies in nonobstetric surgeries found little evidence to support the use of normovolemic hemodilution alone to reduce the need for allogeneic blood; furthermore, the volume of blood harvested preoperatively may not be adequate in the presence of massive obstetric hemorrhage or feasible if the parturient is anemic.[39,40] Nonetheless, acute normovolemic hemodilution may be considered for Jehovah's Witness parturients who are at risk of massive blood loss because the removed blood contains not only red blood cells but also platelets and coagulation factors.

Intraoperative blood cell salvage is the technique whereby blood shed during surgery is collected, washed, and filtered for the purpose of producing autologous red cells that may be transfused back to the patient.[41] Cell salvage use in the setting of anticipated massive obstetric hemorrhage has been recommended in several guidelines by medical societies (i.e., American Society of Anesthesiologists, American College of Obstetricians and Gynecologists, The Royal College of Anaesthetists, and The Association of Anaesthetists of Great Britain and Ireland) because it may reduce allogeneic blood product transfusion, increase postoperative hemoglobin, and shorten hospitalization.[42–50] Intraoperative cell salvage use has been described in the management of several Jehovah's Witness patients.[40,42,51] The use of this technique requires coordination of resources and the presence of a transfusionist; these resources are often not immediately available on obstetric units.

Historically, clinicians have hesitated to use cell salvage during and after cesarean delivery for fears of iatrogenic amniotic fluid embolism and maternal–fetal anti-D alloimmunization.[41,42,52] Its use in obstetric surgery is supported by an observational study of >800 surgeries in which >400 obstetric patients were transfused with salvaged blood without incident.[43] A single report suggested an association between cell salvage use and a maternal death; however, others have argued that the use of cell salvage was an unlikely contributor to this patient's death. [53,54] Cell salvage systems cannot differentiate between maternal and fetal red

blood cells; hence, there remains increased risk of maternal alloimmunization in cases of incompatibility between maternal and fetal antigens. Anti-RhD immunoglobulin should be administered to prevent Rhesus isoimmunization of Rhesus-negative mothers who receive cell-salvaged blood.[41,44,55,56]

Anesthetic and Surgical Techniques

Anesthetic and surgical techniques should be meticulously formulated to minimize oxygen consumption, maximize oxygen delivery, and decrease blood loss. Deliberate hypotension and deliberate hypothermia are techniques that have been described in the care of Jehovah's Witnesses undergoing nonobstetric (e.g., cardiac, cranial, orthopedic, and urologic) procedures.[57] The use of crystalloid and colloid solutions for intravascular volume expansion is advocated.

In any setting, one of the mainstays to optimal management is to avoid delay in executing interventions that may decrease hemorrhage. The surgeon with the greatest expertise should perform the procedure. If massive obstetric hemorrhage is anticipated, electrocautery, argon beam coagulation, endometrial tamponade, topical hemostatic agents, uterotonic agents, and prophylactic uterine artery embolization should be considered.[58] Expedient decisions should be made with regard to surgical interventions. Particularly in cases in which the woman has refused blood transfusion, performance of cesarean hysterectomy as a means to definitively control bleeding should be considered early rather than late, before the hemoglobin decreases to life-threatening levels.[58,59] Clinicians should also anticipate intensive care unit admission in the event of massive blood loss, severe coagulopathy, and anemia.

Special Considerations for Performance of Epidural Blood Patch

Epidural blood patch may be offered to Jehovah's Witnesses who experience postdural puncture headache. A special consideration for performing the procedure in this patient population includes maintenance of a closed circuit so that the blood remains "continuous" with the patient's body. The IV access site from which the blood will be obtained is secured after the epidural space is located. A continuous line can be established from this site using a 3-way stopcock connecting a 20-mL syringe and the epidural needle (Supplemental Digital Content 3, http://links.lww.com/AA/B188).[19,47,61–64]

CONCLUSIONS

Management of the Jehovah's Witness parturient who refuses blood transfusion involves specific medical, ethical, and legal considerations. The physician must be knowledgeable about the Jehovah's Witnesses' beliefs on blood transfusion and the available resources at his or her institution. Favorable outcomes can be achieved with the use of a communicative multidisciplinary approach early in the antepartum period that is maintained throughout the entire perioperative period. This shared decision-making by both patients and care providers will ensure that strategies are expediently pursued that decrease blood loss and maintain hemostasis while respecting the patient's rights.

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