EMERGENCY SUBTOTAL COLECTOMY IN A JEHovah'S WITNESS WITH MASSIVE LOWER GASTROINTESTINAL BLEEDING: CHALLENGES ENCOUNTERED AND LESSONS LEARNED

By Shankar R. Raman, MD, MRCS, Vellore S. Parithivel, MD, and John M. Cosgrove, MD

Abstract A 66-year-old woman who was a Jehovah's Witness had massive lower gastrointestinal bleeding and subsequent hypovolemic shock, necessitating a subtotal colectomy. During the postoperative period, her hemoglobin level decreased to a low of 2.6 g/dL, prolonging her dependence on mechanical ventilation. Prudent perioperative care resulted in a successful outcome. Blood-conserving techniques are indispensable in the management of Jehovah's Witnesses who have massive blood loss. Maximizing oxygen transport, minimizing blood loss, using a cell saver when permissible, providing optimal ventilatory support, performing tracheostomy early if prolonged mechanical ventilation is expected, and augmenting hemoglobin production with administration of iron and erythropoietin are techniques that can facilitate successful outcome in patients who refuse blood transfusion. (American Journal of Critical Care. 2011;20:179,176-178)

Managing massive blood loss in patients who refuse administration of blood products is difficult. Jehovah’s Witnesses typically refuse to receive whole blood and all component therapy, although this issue must be discussed individually with each patient because considerable variation exists between patients. We describe a case of massive bleeding in the lower part of the gastrointestinal tract in a Jehovah’s Witness that necessitated subtotal colectomy, discuss the challenges in the perioperative period, and indicate strategies that led to a successful outcome.

Case Report A 60-year-old woman who was a Jehovah’s Witness had had painless bright red bleeding from...
the rectum for 2 days. Results of physical examination were unremarkable except for the presence of bright red blood on digital rectal examination. At admission, the hemoglobin level was 9 g/dL, and the hematocrit was 27.9%. Results of endoscopy of the upper part of the gastrointestinal tract were unremarkable. During colonoscopy, the patient had a large bout of bright red bleeding from the rectum and became hypotensive. Colonoscopy showed pancolonic diverticulosis, and the colon was filled with blood. At this time, the hemoglobin level decreased to 5.6 g/dL and the hematocrit to 17%. While the patient was being prepared for exploratory laparotomy, she refused blood transfusion. She understood the risks involved, including death, and her advance directive stated that no blood or blood products should be used. Laparotomy confirmed numerous blood-filled pancolonic diverticula. The small bowel was free of blood or other pathological changes.

Subtotal colectomy with ileorectal anastomosis was performed. The intraoperative blood loss was about 150 mL. The hemoglobin level and hematocrit immediately after surgery were 3.3 g/dL and 10%, respectively. Throughout the postoperative course, the patient’s health care proxy made decisions with input from the hospital’s liaison committee of Jehovah’s Witnesses. Intravenous iron 125 mg/d and recombinant human erythropoietin 10,000 IU/d were administered postoperatively on alternate days. Blood samples for laboratory tests were obtained at 48- to 72-hour intervals, and neonatal collection tubes were used to minimize blood loss. Adequate sedation and analgesia with mechanical ventilation were used. Hemoglobin level and hematocrit reached a low of 2.6 g/dL and 8%, respectively, prolonging the patient’s dependence on mechanical ventilation. However, the results of coagulation studies remained normal.

After sedation was stopped, the patient remained unresponsive for 48 hours even though computed tomography showed no abnormalities in the brain. Unsuccessful attempts to wean her from mechanical ventilation necessitated a tracheostomy on postoperative day 12. Recuperation was slow; hemoglobin level and hematocrit increased gradually (see Figure), and she had a full neurological recovery. The patient was weaned from mechanical ventilation, and a tracheostomy collar was placed on postoperative day 19. She was discharged 34 days after the colectomy; the hemoglobin level was 9.1 g/dL, and the hematocrit was 29.1%. Two years after the subtotal colectomy, she was healthy and had no major effects on her lifestyle due to the surgery.

Discussion

The blood ban of Jehovah’s Witnesses applies not only to whole blood but also to blood components, such as red blood cell concentrates, white blood cells, plasma, and platelets. At times, some Jehovah’s Witnesses might accept immunoglobulins, clotting factors, and interferons; use of these components is at the discretion of the individual. Prohibition of blood transfusion poses a challenge, both medically and ethically, for physicians caring for critically ill Jehovah’s Witnesses.

Strategies for successful outcome include early detection and control of bleeding, minimization of perioperative blood loss, maintenance of oxygen delivery, intraoperative blood conservation, and appropriate postoperative management.

Hemorrhage Control

A high level of suspicion helps in early detection of life-threatening hemorrhage. For trauma patients who are Jehovah’s Witnesses, some authors have advised early operative intervention in conditions that would otherwise be managed nonoperatively. Exsanguinating Jehovah’s Witnesses have a low hemodynamic reserve, so early intervention is often beneficial. Angioembolization may be used, if available, to arrest blood loss. Our patient became hypotensive so rapidly that we did not deem a trip to the radiology suite safe. Diagnostic phlebotomy should be restricted to necessary tests, and neonatal collection tubes should be used.

Volume Replacement

Optimal circulating blood volume in Jehovah’s Witnesses is maintained by using crystalloids and colloids. Low-molecular-weight hydroxyethyl starch may be better than its high-molecular-weight counterpart, which has antiplatelet properties and adverse effects on coagulation. Mackenzie et al reported using a hemoglobin-based acellular oxygen-carrying solution (HBOC-201) in a Jehovah’s Witness with traumatic hemorrhagic shock when the patient’s hemoglobin level reached a low of 4.5 mg/dL;

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eventually the patient had a successful outcome. Of note, HBOC-201 is not approved by the Food and Drug Administration, and the agency has placed a moratorium on research involving this product because of increased mortality and end-organ dysfunction.7

**Oxygen Demand and Transport**

Optimal ventilation and oxygenation are of paramount importance in intubated Jehovah’s Witnesses. This goal can be reasonably achieved by individualized ventilator management, with use of a high fraction of inspired oxygen as needed.8 Early tracheostomy in patients with respiratory failure may facilitate better pulmonary toilet9 and decrease work of breathing.9 Appropriate and adequate analgesia, sedation,9 use of muscle relaxants,10,11 and controlled hypothermia13 have been suggested as techniques to decrease oxygen demand. Although hypothermia may decrease tissue oxygen requirement and the metabolic rate, it may also predispose to bleeding by impairing procoagulant factors. Hence, hypothermia should be instituted only after adequate hemostasis is achieved.

**Intraoperative Blood Conservation**

Intraoperative blood loss is minimized by fastidious attention to hemostasis. Recombinant factor VIIa has been used in Jehovah’s Witnesses to arrest gastrointestinal bleeding.14 Although most Jehovah’s Witnesses accept use of this agent, some may not, as in our case. Although preoperative autologous blood transfusion is not accepted by Jehovah’s Witnesses, intraoperative hemodilution and use of cell salvage may be considered admissible, again at the patient’s discretion. In acute normovolemic hemodilution, blood is withdrawn at the start of surgery, intravascular volume is maintained with crystalloids or colloids, and the withdrawn blood is transfused after hemorrhage is controlled. Although this method obviates allogenic blood transfusion and has theoretical advantages such as low viscosity with low systemic resistance and preservation of a patient’s inherent coagulation, the overall benefit remains inconclusive.15 Also, if blood volume is low to start with, as in our case, this technique may not be applicable and may be contraindicated. Dilutional coagulopathy did not develop in our patient despite massive blood loss and volume replacement. This absence of dilutional coagulopathy is consistent with the perioperative management and supportive care.
with practice guidelines,\textsuperscript{17} which suggest that adequate coagulation can proceed even if the levels of coagulation factors are 20% to 30% of the normal concentrations and fibrinogen levels are 75 mg/dL, values that most often occur in patients with blood loss equivalent to the entire blood volume.

**Postoperative Care**

The postoperative care of severely anemic patients requires scrupulous attention to early diagnosis and management of rebleeding, adequate gastrointestinal and thromboembolic prophylaxis, and early use of erythropoietin and iron therapy. Corwin et al\textsuperscript{18} found an increase in hemoglobin concentration and a significant mortality benefit for trauma patients who received epoetin alfa but no decrease in the number of patients who required blood transfusion. However, Price et al\textsuperscript{19} suggest that use of erythropoietin postoperatively may be ineffective because of pro-inflammatory cytokines and abnormal iron metabolism.

**Communication**

The importance of clear 2-way everyday communication between health care providers, patients, and patients’ family members cannot be overemphasized. A hospital liaison committee for Jehovah’s Witnesses is available in major medical centers and helps in contacting physicians who have experience caring for critically ill patients who are Jehovah’s Witnesses.\textsuperscript{20}

**Conclusion**

Although caring for critically ill patients who are Jehovah’s Witnesses poses challenges, adequate tools are available to facilitate a favorable outcome for not only Jehovah’s Witnesses but also any patient who refuses blood transfusion. Well-planned and judicious perioperative care can lead to a satisfactory outcome for both critically ill patients who refuse blood transfusion and the physicians who provide care for such patients.

**FINANCIAL DISCLOSURES**

None reported.

**REFERENCES**


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Am J Crit Care 2011;20 176-178 10.4037/ajcc2011498
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