Supportive treatment of severe anaemia in a Jehovah's Witness with severe trauma

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Introduction

The refusal to receive a blood transfusion, even in a critical situation, can be a potentially fatal decision. This is where Jehovah's Witnesses differ as patients. These patients do not, however, refuse all medical care, they only wish not to be given blood, a wish rooted in religious beliefs. The denomination of Jehovah's Witnesses was founded as a Bible study group in the USA in 1869 by the American Charles Taze Russell. The number of members is growing; Denmark has about 14,000 Jehovah's Witnesses, while there are over 7 million globally.

Jehovah's Witnesses follow a strict interpretation of certain passages of the Bible, and the members are, among other things, forbidden from "consuming" blood (Genesis 9:3-4, Leviticus 17:10-11). If these directives are not followed, members face the risk of being ostracised or excommunicated, thereby losing their possibility of an eternal life.

Conventional wisdom holds that a certain low level of haemoglobin puts a patient at risk and, in the case of significant bleeding, this threshold can be reached quickly. The routine treatment in this circumstance is the transfusion of blood products. However, in the case of Jehovah's Witnesses, alternative solutions must be sought.

This case report describes the successful treatment of a traumatised Jehovah's witness with a very low haemoglobin concentration in the intensive care unit (ICU).

Case report

A 65-year old male Jehovah's Witness, suffering from post-traumatic stress syndrome, but otherwise clinically healthy, was admitted to his local hospital a week after falling at home and suffering blunt trauma to the left side of his thorax. The patient was admitted by an on-call general practitioner because of increasing pain and tachypnoea. On examination, the patient had a large, left-sided subcutaneous haematoma from the axilla to the knee and a chest X-ray showed that the 4^{th}-9^{th} ribs were fractured.

His haemoglobin was 6.4 g/dL. Computed tomography scans revealed a left-sided pneumo-haemothorax and splenic rupture, necessitating acute surgery. The patient was completely awake and aware and despite being informed about his increased risk of mortality, refused to receive blood transfusions because of his religion.

Prior to surgery, the patient was hypotensive (blood pressure 105/62 mmHg, heat rate 86 bpm), and was treated with colloids and crystalloids, which were supplemented peri-operatively with phenylephrine, to maintain a systolic blood pressure of 70-100 mmHg. The haemothorax was drained through a chest-drain, in which 2 litres of blood was collected. The patient was splenectomised and during the operation, multiple ischemic perforations of the intestines were discovered, necessitating an ileocoecal resection in addition. The use of cell saver was deemed not possible because of the ischaemic perforations of the bowels and the consequent risk of contamination.

After surgery had been completed, the patient was admitted to the ICU with shock, and required high doses of noradrenaline to maintain a blood pressure of 80/45 mmHg, with a heart rate of 110-160 bpm. His urine output was low (20 mL/hour) and the his lactate level was slightly raised at 2.2 mmol/L.

The patient was kept sedated and mechanically ventilated with a high concentration of oxygen.

His post-operative haemoglobin concentration was 4.6 g/dL. The day after the operation he started treatment with erythropoietin 10,000 IU every second day, together with intravenous iron and B12 supplements. Broad-spectrum antibiotics were started because of laboratory indicators of infection (leucocytosis 38.8×10^9/L; C-reactive protein 188 mg/L) and chest X-rays showing bilateral infiltrations.

Two days after the primary surgery a "second look" operation was performed to check that the intestinal anastomosis held sufficiently. Tranexamic acid was administered in the period between these operations.

Three days after primary surgery and 10 days after the initial trauma, the patient's haemoglobin dropped to its lowest level of 3.5 g/dL. Five days later it had risen to 5.1 g/dL, but the patient's situation was complicated by rupture of the abdominal fascia, and *E. faecium* was grown from the abdominal wound.

Increasing amounts of purulent secretions from the patient's chest drain led to the suspicion of a pleural empyema. Cultures revealed *Citrobacter spp*. and non-haemolytic streptococci organised around a costal fragment that was bent and protruded into the thorax, necessitating transfer to a specialist hospital for removal. Broad-spectrum antibiotics were continued

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and a cell saver was deemed feasible for the procedure of decortication and removal of the costal fragment, as a precaution to minimise further blood loss. Post-operatively the patient was treated for infection and the abdominal wound required a prolonged period of healing through vacuum dressings.

The patient was transferred back to the ICU at his local hospital for weaning from the ventilator 3 weeks after transfer to the thoracic surgery department and 6 weeks after the initial trauma. The patient was transferred in his habitual good health and with a haemoglobin concentration of 11.2 g/dL. After this the patient was moved to a surgical ward. He was then discharged after a total of 8 weeks' hospitalization, 5 of which he spent in the ICU. The patient then eagerly began physical rehabilitation.

Discussion

This clinical case highlights some of the therapeutic challenges that can be met in the treatment of severe, acute anaemia in a patient who does not wish to receive blood transfusions.

Establishing a definitive "haemoglobin transfusion threshold" has proven difficult, but studies have shown that mortality increases in patients with haemoglobin concentrations below 5 g/dL[1]. For healthy individuals, the threshold may be even lower, but comorbid conditions such as trauma, sepsis and cardiovascular disease may influence this threshold.

Assessment of religious beliefs that affect treatment, such as transfusion preferences, should be made initially, and the patient and/or family provided with information and thereby the ability to make an informed choice. The situation in which a patient refuses a treatment and could die in a potentially "treatable" situation creates an ethical dilemma for the health care professional, as well as being a frustrating experience[2]. However, when a patient makes an informed choice, the health care professional must respect the patient's wish. Not adhering to a known refusal puts the health care professional at risk of legal prosecution, while the matter is more difficult when the patient's autonomy is in question, his or her wish is not known, or in the case of children.

The ban against transfusion includes whole blood as well as its components, erythrocytes, white blood cells, platelets and plasma. However, there is some variation within the religious group, with some members accepting components such as albumin, recombinant human erythropoietin and immunoglobulin. This must be discussed with each individual patient in order to apply his/her personal choice.

Without the possibility of transfusion as the standard treatment of severe acute anaemia, clinicians must use supportive techniques to optimise the patient's own circulation and oxygen-carrying capacity. Volume therapy with crystalloids or colloids can be administered immediately to ensure a sufficient circulatory volume. A potentially reversible coagulopathy should be identified through coagulation studies. During surgery, meticulous management of bleeding is of utmost importance.

The patient's relatives appealed for the use of erythropoietin, a treatment which is expensive, not instantaneous, and controversial, both in terms of dosage and effect[1-3].

Autologous transfusion of packed red blood cells is not accepted by Jehovah's Witnesses, as this blood has been removed from the body. Strategies involving a cell saver, in which a patient's own blood is continuously infused while it is collected and, therefore, stays in contact with the patient's vascular system, are accepted by some Jehovah's Witnesses[4].

Sedation and paralysis to decrease metabolism, mechanical ventilation with a high oxygen fraction to maximise oxygen uptake[5] as well asinotropes/vasopressors to support the circulation require admission to an ICU. Antifibrinolytics and minimisation of "routine" blood sampling were also used to further conserve blood.

Conclusion

Refusing blood transfusions is not without complications. The case reported here shows that while it is possible to survive a haemoglobin drop to 3.5 g/dL, this is not done without cost, with our patient suffering multiple complications and prolonged morbidity. This case shows why transfusion indications continue to be a topic of debate and something that should be considered individually for each patient.

Keywords: anaemia, trauma, Jehovah's Witness, refusal of transfusion.

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