Managing patients who refuse blood transfusions

Cell savers may be unacceptable

EDITOR,—I note that the first of two patients reported on who initially refused a blood transfusion underwent surgery two weeks later with the aid of a cell saver.¹ The belief of Jehovah's Witnesses that they must "abstain from blood" is widely known to preclude the administration of homologous transfusion with blood products. Many Jehovah's Witnesses also believe, however, that the reinfusion of their own blood lost from their body is also against their teachings. This means that they may also refuse the use of such techniques as intraoperative cell savers, reinfusion drainage systems, extracorporeal circulation, and predonation of blood for autologous transfusion. If the use of such a technique is considered and the patient is a Jehovah's Witness the technique must be fully discussed with the patient preoperatively so that his or her beliefs are not contravened; this is in line with the principles of informed consent.

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1 Finfer S, Howell S, Miller J, Willett K, Wilson-MacDonald J, Wilson DH, *et al.* Managing patients who refuse blood transfusions: an ethical dilemma. *BMJ* 1994;308:1423-6. (28 May.)

100% Oxygen at normal pressure is an alternative

EDITOR,—Two aspects of the management of patients who refuse blood transfusion deserve emphasis.¹ The first point concerns the administration of 100% oxygen at normal pressure. When a patient is breathing air the concentration of oxygen in solution in arterial blood is only about 3 ml/l. This compares with a concentration of 25 ml/l for oxygen in combination with haemoglobin at a critical haemoglobin concentration of 20 g/l. If the patients breathes 100% oxygen the amount in solution should increase to about 20 ml/l, which is the equivalent of increasing the haemoglobin concentration (while the patient is breathing air) from 20 to 34 g/l, a concentration usually compatible with survival. Hyperbaric oxygen is even more effective, as James Watt notes,¹ but is available in only few centres. Orthobaric oxygen is available in all hospitals, although its effective administration at 100% concentration requires attention to detail. Fluorocarbons may

have a role in enhancing the amount of oxygen in solution.

The second point is the crucial role of tissue perfusion. Oxygen delivery is the product of perfusion and arterial oxygen concentration.² Organ perfusion is often decisive, but the normal value for whole body oxygen delivery is of the order of 1000 ml/min; the minimum level compatible with survival is unknown, but indirect evidence suggests that it is rather less than 400 ml/min. Survival at critical haemoglobin concentrations of the order of 20 g/l thus depends on cardiac output increasing to about 14 l/min. Arterial pressure is important, but the critical variable is flow and not pressure.

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1 Finfer S, Howell S, Miller J, Willett K, Wilson-MacDonald J, Wilson DH, *et al.* Managing patients who refuse blood transfusions: an ethical dilemma. *BMJ* 1994;308:1423-6. (28 May.)

2 Nunn JF. *Applied respiratory physiology*. 4th ed. London: Butterworth, 1993.

Proposed alternatives are incorrect

EDITOR,—James Watt's suggestion that hyperbaric oxygen would have been at least as efficacious as, and less dangerous than, blood transfusion in the management of a man who refused blood products after suffering extensive orthopaedic trauma¹ is erroneous. Hyperbaric oxygen cannot be regarded as a practical alternative to blood transfusion to ensure adequate oxygen delivery for any length of time in such patients.

Oxygen must be given at 3.04×10^5 kPa to supply the body's total demand in the form of dissolved oxygen (60 ml/l).² This can be achieved only intermittently for short periods, since continuous administration produces oxygen toxicity within hours, manifest by convulsions and serious pulmonary complications (atelectasis, oedema, and fibrosis), and would ultimately be fatal.³ In addition, there are practical problems in caring for critically ill patients being given hyperbaric oxygen: the safety of the attenders, who require safe decompression; the increased fire hazard; and the care of equipment, including ampoules, which may implode, and endotracheal cuffs, which will deflate at the high pressures. Providing hyperbaric chambers to many hospitals to treat such a minority of patients if they should need it would not be cost effective, especially when the dubious indications and problems are considered.

Watt also wrongly implies that regional anaesthesia would have been a safer alternative to general anaesthesia in such a patient. An epidural or subarachnoid block would produce profound hypotension in a bleeding patient and is absolutely contraindicated.⁴ Peripheral nerve blockade to effect adequate anaesthesia for above knee amputation requires multiple injections (to block the sciatic, femoral, obturator, and posterior cutaneous nerves of the thigh).⁵ The possibility of even an experienced anaesthetist missing one of these nerves precludes the use of peripheral nerve blockade as the sole technique. General anaesthesia would be preferred by most anaesthetists in such a case.

The role of erythropoietin is limited to the prolonged postoperative phase in accelerating the rise in haemoglobin concentration and thus would

have been of no benefit to the patient who died. No mention is made of the synthetic oxygen carriers, which, although not yet fully developed, will potentially be useful in such situations.

We uphold the wishes of all our patients, but the alternative treatments proposed by Watt seem questionable, especially in the acute phase; in particular, hyperbaric oxygen treatment at the levels quoted would prove lethal.

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1 Finfer S, Howell S, Miller J, Willett K, Wilson-MacDonald J, Wilson DH, *et al.* Managing patients who refuse blood transfusions: an ethical dilemma. *BMJ* 1994;308:1423-6. (28 May.)

2 West JB. *Respiratory physiology—the essentials*. 3rd ed. Baltimore: Williams and Wilkins, 1979.

3 Clark JM. Oxygen toxicity. In: Bennett PB, Elliott DH, eds. *The physiology and medicine of diving*. London: Baillière Tindall, 1982.

4 Donald KW. Oxygen poisoning in man. Part I. *BMJ* 1947;i: 667-72.

5 Wildsmith JAW, Armitage EN. *Principles and practice of regional anaesthesia*. Edinburgh: Churchill Livingstone, 1987.

Puts additional burdens on the rest of society

EDITOR,—The cases of Finfer *et al.*¹ illustrate a well known difficulty in the treatment of Jehovah's Witnesses, who do not wish to act counter to an unusual interpretation of an ancient scripture. These cases were managed without the transfusion of blood products; one patient died, and the other, surprisingly, survived.

Jehovah's Witnesses believe that, even when they have been seriously injured, avoidance of blood products is their highest responsibility. This is their privilege in a free society, but it is not the Jehovah's Witness's only responsibility. Like everyone else, they are responsible for the care of their families and the development of their church. In my opinion, they also have a responsibility not to put additional burdens on the rest of society in the pursuit of this privilege for themselves.

Alternative treatments are imperfect by all orthodox measures. General hospitals will never maintain hyperbaric chambers to provide alternative treatment for the occasional Jehovah's Witness, as one of the commentators on the cases reported by Simon Finfer and colleagues suggest. A cell saver was used in one of the cases, presumably because this does not contravene the interpretation of the scripture. Could Jehovah's Witnesses fulfil all their responsibilities by establishing a blood bank for autotransfusion? Procuring and thawing blood in an emergency would be slower than usual, but it could improve care compared with the current alternatives.

Lastly, all the commentaries on the paper support managing these cases without transfusion. The commentators are a former medical missionary, a Jehovah's Witness, a lawyer, and one of the clinicians reporting the cases. Excellence in editorial practice requires that all material aspects (especially for a non-scientific issue) should be available to readers unless the position of the editor has been clearly stated. Was it impossible to find a physician, surgeon, or anaesthetist who would write in support of giving transfusions to these

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