Warm is better than cold: hypothermia in abdominal aortic aneurysm surgery

Most of us agree shivering is unpleasant. In patients undergoing surgery for abdominal aortic aneurysm (AAA) falls in temperature below a certain level can make the difference between a good and poor outcome.

An AAA is usually asymptomatic or may be a cause of abdominal or back pain. In certain situations the aneurysm can rupture leading to collapse or even death due to catastrophic blood loss. This means physiologically these patients may well be systemically unwell prior to any intervention for their aneurysm. Under these circumstances, significant blood loss with an open abdomen may mean dramatic falls in temperature, unless active warming measures are performed.

A body temperature less than 36°C is defined as hypothermia and, in the context of surgery for AAA, temperatures below this may lead to complications such as prolonged hospital and critical care length of stay, organ failure and death. This is because a low body temperature has been linked to worsening blood loss, infections and heart dysfunction. Deliberate hypothermia may be beneficial in certain situations and indeed is actively performed, such as when operating on the brain or heart to reduce metabolism and preserve tissue perfusion.

So how can we prevent a patient from getting cold? Warming the fluids and blood being given through a drip during the operation and forced air warming such as covering the patient with a Bair Hugger blanket are successful warming methods. As always, prevention is better than cure and it is better to keep the patient warm rather than wait until they become hypothermic.

Patients undergoing surgery for a ruptured AAA will invariably be more unwell than those who are undergoing elective surgery. Therefore, the role of temperature on outcomes needs to be interpreted differently, depending on whether the patient is having an urgent or a planned operation. Another differentiation needs to be made between open surgery, where a large surgical incision is made across the abdomen, and less invasive surgery (endovascular repair). Endovascular aneurysm repair (EVAR) can access the aneurysm via a groin incision and may potentially minimise fluctuations in core body temperature. One study that compared two groups of patients with a ruptured AAA, having either open or EVAR, found that the lowest temperature during surgery was recorded in patients who had open surgery. This raises the question whether patients who are already significantly cold before surgery should be deemed high risk and be considered for endovascular repair. However, EVAR is not appropriate in all patients and the characteristics of the aneurysm such as its anatomy, neck morphology and iliac arteries need to be considered.

Our review aims to raise awareness about the effect of body temperature on outcomes in AAA surgery. Very often temperature is overlooked as an important factor in outcomes for AAA

intervention. This article stresses the importance of body temperature and warming methods on AAA surgery. Collecting data on these parameters more consistently in the future will allow for more research to be carried out.

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