Reducing the burden of anaemia for people undergoing major surgery

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Pathways and a culture that view blood as disposable must yield to approaches that value patients' own blood

The often predictable haemostatic challenge of surgery includes the possibility of anaemia increasing procedure-induced stress and consequently the burden on the patient during the operation and their recuperation. Peri-operative anaemia has often been managed by transfusion. Blood was regarded as disposable, and the ready supply of donor blood has enabled higher risk invasive procedures in the knowledge that blood can be replaced even in the event of excessive loss. Despite considerable advances in the safety of transfusion, blood remains a biological product with residual risks, including infection and immunological effects. Further, each unnecessarily transfused unit of blood increases the burden on donations.

Patient blood management guidelines were developed to use donated blood more appropriately and to protect patients from unnecessary hazards of transfusion.[1] However, the intention is not to stop transfusions, but to achieve better patient outcomes by optimising and preserving the patient's own blood. Transfusion should not be a substitute for care that restores a patient's own red cells and optimises haemostasis. As for all therapies, red cell transfusion should be reserved for those likely to benefit.

In this issue of the *MJA*, the POSTVenTT Study Collaborative, recognising the value of patient blood management as advocated by national and international guidelines,[2,3] reports its investigation of evidence-based patient blood management in 56 Australian and New Zealand hospitals.[4] The authors found that too many patients underwent major abdominal surgery without appropriate attention to pre- and post-operative anaemia. They identified minimal use of anti-fibrinolytics for reducing bleeding and inadequate follow-up of anaemia after procedures. Even allowing for the limitations of data capture, their findings point to widespread systemic deficiencies in peri-operative patient blood management.

Opportunities to reduce the impact of anaemia by iron replacement before surgery are often missed. Functional performance in cardiac failure (even in the absence of anaemia), better peri-operative haemoglobin levels, and lower re-admission rates after surgery can be achieved with proactive iron replacement.[5,6] The POSTVenTT Study Collaborative found that 28% of patients for whom haemoglobin was assessed prior to surgery (90.2% of all patients) had anaemia; further, ferritin was measured in only 35% of patients with pre-operative anaemia, 27% of whom had an absolute iron deficiency.[4] Correcting iron deficiency is simply good care for patients facing the challenges of surgery, and it is reasonable to ask why we are not routinely providing it.

Tranexamic acid during surgery can reduce the need for transfusion in procedures with high risks of bleeding. Despite being simple and inexpensive, the POSTVenTT Study Collaborative found that tranexamic acid was administered to only 22 of 78 patients requiring transfusion (28%).[4] Other intra-operative strategies that effectively reduce blood loss, such as meticulous surgical haemostasis, permissive hypotension, and cell salvage,[2] were not assessed by the authors. Restrictive transfusion strategies after surgery were applied to only 96 of 167 patients requiring transfusion (58%). Monitoring of patients for anaemia after surgery was suboptimal: 79.3% were assessed one to three days after surgery, of whom 68.4% had anaemia; only 17.9% were assessed within thirty days of discharge, 54% of whom had anaemia.[4] The finding that the 30-day re-admission rate was nearly twice as high for people with anaemia at discharge (14% *v* 7.4% of those assessed) suggests that more proactive follow-up would be of value.

In retrospective studies, data gaps (eg, missing data related to the transition from hospital care) may exacerbate apparent practice deficits. The authors included procedures in which major bleeding is not typical, but their sensitivity analysis excluding cholecystectomies suggests that peri-operative patient blood management is a more general problem.

Given the relatively low costs and ease of use of the relevant interventions, and the high community prevalence of low iron levels, it is difficult to pinpoint why evidence-based interventions are not universally implemented. Practical problems may be barriers, such as the availability of intravenous iron in some non-procedural practices or the time available for optimising iron stores following pre-admission clinic visits. However, despite efforts to improve peri-operative patient blood management,[7] the POSTVenTT Study findings indicate that systemic adoption of guidelines remains the exception.[4]

The POSTVenTT Study focused on hospital-based interventions, but the best opportunities for iron optimisation arguably precede contact with the hospital. The pre-admission clinic visit is often too late for offering low cost oral iron supplementation, which

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could be effective for many people were treatment initiated earlier. As an example, optimal care pathways for people with bowel cancer, in which iron deficiency and major surgery are expected, do not include blood management or ensuring iron sufficiency.[8] Efforts to improve cardiovascular fitness prior to surgery may also improve post-operative anaemia tolerance.

A decade after their publication, peri-operative patient blood management guidelines have not been comprehensively integrated into practice.[2] Nevertheless, individual practitioners can still make a difference by attending to haemoglobin assessment, haemostasis, and cardiorespiratory optimisation. Each meeting with the patient, including for surgical referral and review, endoscopy, gynaecological assessment, and the pre-admission clinic visit, provide opportunities to prepare people for surgery. Blood can be conserved during the procedure by appropriate anaesthesia and surgery decisions. There are further opportunities for assisting post-surgical recovery with restrictive use of red cell transfusion and parenteral iron, if required.

The value of engaging medical trainees in research and review is recognised by training colleges and registration bodies. The investigation by the POSTVenTT Study Collaborative could be a model for practitioners to critically review practice, collecting evidence to improve standards of care.

Given the potential to improve patient outcomes, including reduced hospital length of stay and re-admission numbers,[6] we should value care provided before and after surgery just as we do the procedure itself. Pathways and a culture that view blood as disposable, with passive reliance on transfusion, must yield to approaches that value patients' own blood.

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