

## Blood product usage

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Over the past two decades, researchers have emphasised both the positive and negative effects of blood product usage and highlighted the importance of the identification and management of anaemia. We now have a clearer, although not complete, understanding of rational and appropriate blood product usage, with several guidelines and changes in the strategies for blood product administration. This shift in thinking has included the introduction of 'Patient Blood Management' (PBM) – the application of evidence-based practices to optimise patient outcomes by managing and preserving the patient's own blood. Recently proposed as a potential solution for the South African context, PBM is particularly relevant considering the high prevalence of anaemia in our population, the severe blood product shortages, dwindling blood donor pool, and high demand for blood products.<sup>1</sup>

In this issue, Jadhunandan et al. have highlighted the prevalence of perioperative anaemia in patients undergoing open intra-abdominal surgery at a tertiary South African hospital.<sup>2</sup> Perioperative anaemia is associated with worse outcomes. However, simply transfusing red cell concentrate to patients before or during surgery does not necessarily improve the delivery of oxygen, decrease complications or enhance outcomes.<sup>3-5</sup> Identification of anaemic patients is the first important step to optimising red cell mass and avoiding complications associated with perioperative anaemia. Mixed surgical populations are known to have a higher prevalence of anaemia when compared to the general population. In South Africa, perioperative anaemia is associated with a greater need for critical care services and increased complications.<sup>6</sup>

Jadhunandan et al. found a high prevalence of perioperative anaemia in this group of high-risk general surgical patients. Importantly, moderate to severe perioperative anaemia is associated with an increased postoperative mortality. The prevalence was higher than that found in the South African Surgical Outcomes Study (SASOS).<sup>6</sup> There are several reasons for this observation, although they are mostly related to the study population of Jadhunandan et al.,<sup>2</sup> which included more patients with cancer and chronic medical conditions which adversely affect red blood cell production.<sup>2,6</sup>

Improving oxygen delivery is a proposed mechanism for potentially reducing postoperative morbidity and mortality. However, how to achieve this objective is controversial.

Unfortunately, evidence does not support transfusing patients to a higher haemoglobin preoperatively as this may not prevent perioperative complications. Preoperative anaemia is the strongest indicator for perioperative blood transfusion, which itself is an independent risk factor for increased morbidity.<sup>7</sup> As discussed by Jadhunandan et al., preoperative iron therapy provides a potential solution to optimise patients with preoperative anaemia, albeit one that requires planning and the possible implementation of specialised anaemia clinics, perhaps as part of preoperative anaesthetic clinics. Such clinics have been successfully implemented in the South African private sector as the costs and complications of iron therapy have decreased.

In a contrasting article, Mohammad and colleagues provide valuable insight into the anaesthetic management of a rare disease.<sup>8</sup> Patients with osteogenesis imperfecta (OI) provide an array of challenges to the anaesthesiologist (depending on the severity of the condition) and often require multiple and complex surgeries representing numerous anaesthetic consultations, as seen in this cohort with 93 procedures for 39 patients.

Due to the rarity of OI, anaesthesiologists cannot rely on large randomised control trials and instead glean information from large case series or retrospective studies. Mohammad et al. have summarised 18 years of institutional knowledge to identify safe and useful anaesthetic practices, this being the first large anaesthetic paediatric OI case series published from a low-middle-income country. It is reassuring that given the potential complexity of OI patients, the vast majority of patients were managed safely with supraglottic devices (91.9%) under general anaesthesia, with analgesia from a regional technique (87.1%). Difficulty with positioning or inserting the airway device was uncommon. Bag-mask ventilation and laryngoscopy may prove difficult in OI patients, so the use of supraglottic devices provides an advantage, especially when it is preferable to minimise cervical spine movement.

In keeping with the high prevalence of anaemia noted in the paper by Jadhunandan et al., Mohammad and colleagues also found a high prevalence of preoperative anaemia (65%), of which 24% of the anaemic patients being less than 10 g/dl. Fortunately, only four patients were transfused intraoperatively and two postoperatively, in keeping with current guidelines that recommend a restrictive transfusion strategy in both adults and children. Although a different population group, investigators

in the large TRIPICU (Transfusion Requirements in the Paediatric Intensive Care Unit) multicentre noninferiority trial of 637 stable critically ill children found no differences in adverse outcomes between a transfusion threshold of 7 g/dl compared to a liberal strategy of 9.5 g/dl.<sup>9</sup> As noted by Mohmmad et al., the high prevalence of anaemia in the OI population in KwaZulu-Natal represents an opportunity to optimise red cell mass and reduce transfusion requirements in the elective preoperative setting.

These two papers highlight the high prevalence of anaemia in South Africa, and the need to identify and treat anaemia in the perioperative period. A robust PBM programme should be regarded as essential in a resource constrained environment with only a few days stock of emergency blood, and requiring 3 000 units of blood to be voluntarily donated every day to ensure a safe supply.<sup>10</sup> The three pillars of PBM should form the foundation of managing perioperative anaemia, namely augmenting red cell mass, minimising blood loss, and optimising the physiological reserve and risk factors of the patient. Given the increased morbidity and mortality associated with preoperative anaemia, elective surgery should be delayed to optimise patients and treat the cause of the anaemia. Patients should not merely be transfused in the elective preoperative setting, exposing the patient to potential harm. Iron therapy and preoperative clinics that focus on managing anaemia should be more widely considered. Context-sensitive evidence balanced guidelines

are currently in development for South Africa, and will provide direction for clinicians managing such patients.

## References

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