Impact of Preoperative Iron Deficiency on Blood Transfusion in Elective Cardiac Surgery - Reply to N. Mayeur et al

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LETTER TO THE EDITOR

Impact of preoperative iron deficiency on blood transfusion in elective cardiac surgery – reply to N Mayeur et al.

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Declarations of interest:

None.

Dear Editor,

We thank N Mayeur and colleagues for their interesting comment on our article[1], and we would like to respond to their concerns.

Our study emphasized some clinical relevance of ID in patients presenting for elective cardiac surgery by showing an association between ID and RBC transfusion during surgery. We agree that a size effect may have restrained our results, especially regarding the postoperative transfusion and morbidity. Previous studies have shown its association, but the definitions of ID used and the patient populations vary. For example, the recent study from Rossler et al. is a *post-hoc* analysis of a large single-center RCT in patients undergoing elective cardiac surgery. There the authors used a more restrictive definition of ID (serum ferritin < 100 ng/mL), with no consideration for the transferrin saturation[2].

The algorithm we previously proposed for the management of preoperative ID and IDA is not based on a French expert consensus, but adapted from the European guidelines for cardiac failure[3] and from an international expert consensus statement[4] expected to be pragmatic guidance for the diagnosis and management of anemia and ID in surgical patients.

The first step is to select candidates for iron supplementation. The positive aspects of treating all ID patients (even non-anemic) have been recently shown before elective non cardiac surgeries[5], but to date such data are not available for cardiac surgery. We agree with authors considering establishing a 13 g/dL target hemoglobin in both sexes while defining and treating anemia before major surgery[4], but recommending preoperative ID supplementation for all patients remains premature.

When ID supplementation has been decided, it should be initiated as soon as possible before surgery. We agree that IV iron seems to prove its superiority in terms of delays and efficacy to achieve ID and IDA corrections. However, it is still commonly recommended to consider IV treatment as an alternative, in case of surgical delays inferior to 6-8 weeks or when the oral route cannot be used[4, 6, 7].

Finally, data concerning erythropoietin-stimulating agents are inconclusive, and none of the guidelines for cardiac surgery strongly recommend their use[4, 6, 7]. Previous interesting studies about erythropoietin have been published, but often with small size protocols and few data concerning populations, iron status or etiology of anemia. Two recent RCT studying preoperative EPO in elective cardiac surgery have been terminated without reaching required enrolments[8, 9]. A recent pragmatic RCT showed a reduction in all transfusions by treating anemia or ID on the day before surgery[10]. The intervention was a large combination of available treatments, which avoids evaluating EPO itself, and was not in line with a scheduled management over several weeks before surgery. In these conditions, it is also currently impossible to conclude about the benefits of preoperative EPO. The EACTS/EACTA guidelines do not pronounce for erythropoietin in ID patients and only propose that it “should be considered to reduce postoperative transfusions in patients with non-iron deficiency”

(recommendation class IIa; level of evidence B)[7]. As we focused our proposition on ID, EPO does not appear in the proposed algorithm.

To conclude this reply, the perioperative blood conservation and the optimization through a Patient Blood Management are now well established. Physicians are urged to implement such programs worldwide[11]. As ID appears to be of importance in the preoperative period, further well designed studies should be conducted to confirm the trends, aiming to draw a preoperative personalized clinical pathway for each patient. We need to know more about the targeted population (anemia, ID without anemia), about the efficient treatments (IV iron, EPO, vitamins) and about their optimal timing before surgery. We look forward to discovering results of enrolling protocols[12, 13, 14] and hope they will contribute to build safe, efficient, and patient-centered programs.

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