Anaemia is a predictor of mortality in patients undergoing aortic valve surgery

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We read the article ‘Preoperative anaemia is a risk factor for mortality and morbidity following aortic valve surgery (AVS)’ by Elmistekawy et al. [1] with interest. They aimed to investigate the incidence of preoperative anaemia in patients undergoing non-emergency AVS and its association with postoperative outcomes. They concluded that preoperative anaemia is a common finding in patients undergoing AVS and is an important and potentially modifiable risk factor for postoperative morbidity and mortality. We believe that these findings will pave the way for further studies about the relationships between preoperative anaemia and AVS. Thanks to the authors for their contribution.

It is actually believed that patients undergoing heart surgery have a lower margin of safety for tolerance of low haemoglobin (Hg) levels. A significant association between anaemia with adverse outcomes (death, stroke and renal impairment) in patients undergoing cardiac and non-cardiac surgery has been demonstrated in previous studies [2]. Blood transfusion is dangerous with regard to in-hospital mortality, morbidity and long-term survival. Blood transfusion is frequently used as a volume expander while simultaneously increasing the haematocrit. Transfusions have been independently associated with increased mortality after cardiac surgery. Transfusion is also dose-dependent risk factor for early mortality after revascularization. Blood transfusions have been linked to postoperative renal dysfunction, pneumonia, wound infections, severe sepsis and hospital mortality [3]. Based on this point of view, because anaemia and need for blood transfusions lead to very significant adverse effects after cardiopulmonary bypass surgery, it is necessary to research the effective methods of anaemia correction to reduce the need for blood transfusions.

Nowadays, although anaemia is a predictor of postoperative complications and is a risk factor for mortality in patients after cardiac surgery treatment, red distribution width (RDW) is known as an independent early marker of Hg evolution and independently identified risk of new onset anaemia, providing predictive information for haematological abnormalities beyond Hg concentrations and other known risk factors. RDW has recently been identified as an independent predictor of all-cause long-term mortality in patients with coronary artery disease [4]. So, if the authors had mentioned RDW, the results of the study might be different.

Reduced glomerular filtration rate (GFR) may also be associated with adverse outcomes in patients with cardiovascular disease. In previous study, preoperative GFR was predictive of all-cause mortality, cardiovascular mortality and combined cardiovascular mortality and morbidity. GFR may be useful to identify those patients undergoing cardiovascular surgery with subclinical chronic kidney disease [5]. For this reason, it would be better, if the authors mentioned any of these possible conditions.

Finally, it would be better if the authors might define how much time they specified on measuring Hg levels, because it can be associated with haemodilutional anaemia [6]. Following cardiac surgery, some factors including longer hospital stays, increased risk of infection, higher rate of pulmonary complications, prolonged ventilation, stroke, renal failure, atrial fibrillation, myocardial infarction, pneumonia, prolonged ventilation and operation time are associated with increased morbidity and mortality rates in patients undergoing AVS [3]. Further studies should evaluate these factors in patients with AVS.
We thank Balta et al. [1] for their interest in our article: preoperative anaemia is a risk factor for mortality and morbidity following aortic valve surgery [2] and for the interesting points they raised. Balta et al. are in agreement that preoperative anaemia is a common finding and an important risk factor for morbidity and mortality in patients undergoing aortic valve surgery. We disagree with their assertion that blood transfusion is ‘dangerous’. In fact, blood transfusions can be life-saving and make surgery possible in many patients who would otherwise not be candidates for cardiac surgery. It is more likely that the pre-existing conditions that lead to blood transfusion (i.e. preoperative anaemia, excessive bleeding and haemodilution) are likely associated with worse outcome [3, 4]. In our study, red blood cell distribution width was not routinely measured. However, it is unlikely that this would have a significant impact on the primary message of this study. Pre-existing renal dysfunction (as measure by estimated glomerular filtration rate) was incorporated in our multivariable model and was adjusted in this study. Balta et al. also commented that we should define ‘how much time [we] specified on measuring haemoglobin levels’. If the authors mean which preoperative haemoglobin was used to define preoperative anaemia, in our study we used the latest available laboratory result for haemoglobin before surgery to define anaemia. For in-hospital patients, this was the day before the surgery and for elective patients the haemoglobin measurement was typically within 2 weeks of their surgery date. As noted in the study, preoperative anaemia was defined as per World Health Organization guidelines. Finally, we agree with the authors that further studies are warranted to better understand the mechanism and effect of preoperative anaemia on outcome after cardiac surgery.

References


Reply to Balta et al.

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