The influence of baseline haemoglobin concentration on tolerance of anaemia in cardiac surgery

Karkouti K, Wijeysundera DN, Yau TM, McCluskey SA, van Rensburg A, Beattie WS
Transfusion. 2008 Apr;48(4):666-72.

BACKGROUND: Current red blood cell (RBC) transfusion guidelines assume that most acutely anaemic patients can tolerate haemoglobin (Hb) concentrations as low as 6.0 to 7.0 g per dL and recommend that range as the transfusion threshold in patients who have no overt signs of organ dysfunction. Nonetheless, "normal" Hb concentrations vary widely in the population, and this variability may influence patients' tolerance of acute anaemia. This retrospective cohort study was carried out to test this hypothesis. STUDY DESIGN AND METHODS: Data were analyzed on 10,179 consecutive patients who had normal Hb concentrations (12.0-16.0 g/dL in women and 13.0- 18.0 g/dL in men) and underwent on-pump cardiac surgery from 1999 to 2006 at an academic hospital.
The relationships of lowest intraoperative Hb concentration and maximum decrease in Hb concentration (from baseline) with the composite outcome of in-hospital death, stroke, or kidney failure were determined in various patient subgroups. RESULTS: The relationship between lowest Hb concentration and adverse outcomes was not independently associated with increased risk. In contrast, the relationship between maximum decrease in Hb concentration and adverse outcomes was independently associated with increased risk, with a 50 percent decrease being the threshold beyond which risk was increased (adjusted odds ratio, 1.53; 95% confidence interval, 1.12-2.08; p =0.007). CONCLUSION: The degree of acute anaemia that patients can safely tolerate during cardiac surgery is inversely related to their baseline Hb concentration. Current transfusion guidelines do not account for this relationship.