

Blood transfusion decisions cannot be based on percutaneous haemoglobin measurements

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INTRODUCTION: Percutaneous measurement of haemoglobin (SpHb) has been an emerging technique in the past decades. It has been suggested that SpHb measurement could be used as a trend monitor and as a supportive tool for easier and faster transfusion decision-making. The aim of this study was to investigate whether SpHb monitoring is a useful instrument in transfusion decision-making.

MATERIAL AND METHODS: Patients scheduled for surgery with expected blood loss over 800 mL were included in the study. SpHb was measured using a Masimo Rainbow probe. Blood samples were drawn before and after surgery and, if clinically indicated, during surgery. Moreover, perfusion parameters were analysed, as well as transfusion triggers.

RESULTS: Based on transfusion triggers 27.1% of patients would not have been transfused according to National Guidelines (14.5% transfused in error, 12.5% not transfused when indicated). Invasive haemoglobin (invasive Hb) and SpHb were obtained 266 times in 75 patients. The mean invasive Hb was 7.37 ± 1.34 mmol L⁻¹ and SpHb was 6.47 ± 0.81 mmol L⁻¹ ($P < 0.001$). Bland-Altman analysis corrected for multiple measurements revealed proportional bias of $-4.05 + 0.72$ Hb (least bias at Hb 5.62).

CONCLUSIONS: The precision of the SpHb measurement exceeded the acceptable range of error. We concluded that SpHb measurement using the Rainbow device is too unreliable to be an acceptable alternative to invasive Hb measurement, or even as a trend monitor or decision support tool.