

Introduction

Patients with fractured hips are frequently elderly, co-morbid and have a degree of frailty; subsequently they are at greater risk of perioperative morbidity and mortality. Anaemia throughout the perioperative period in this patient cohort has profound effects on end-organ ischaemia and recovery (1); these risks need to be balanced against increased rates of post-operative infection, delirium and length of stay associated with allogenic blood transfusion (2, 3)

Recent guidelines suggest haemoglobin should be maintained above 90 g.l^{-1} for most patients or 100 g.l^{-1} for patients with ischaemic heart disease or those who fail to mobilise on day 1 post-op due to fatigue (4, 5).

The HemoCue® System (HemoCue) has been well validated in a range of patient cohorts but less extensively in the hip fracture population (6). In this study we sought to evaluate the potential use of HemoCue to guide post-operative blood transfusion in patients undergoing hip fracture surgery.

Methods

All fractured neck of femur patients admitted to the trust on days when researchers and HemoCue were available were included in the study. The study was conducted between December 2019 and June 2020.

Blood samples were taken immediately post-operatively and analysed using the HemoCue Hb 201+ System; these haemoglobin concentration results were compared to formal laboratory haemoglobin on the first post-operative day.

Mean haemoglobin concentration was compared using the two tailed, paired t-test. Correlation between the two samples was calculated using Pearson's correlation coefficient

References

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3. Potter LJ, Doleman B, Moppett IK. A systematic review of pre-operative anaemia and blood transfusion in patients with fractured hips. *Anaesthesia*. 2015; **70**: 483-500.
4. Foss NB, Kristensen MT, Kehlet H. Anaemia impedes functional mobility after hip fracture surgery. *Age and ageing*. 2008; **37**: 173-8.
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Results

Fifty-nine patients were eligible for the study, of these 49 had complete data sets including HemoCue and day 1 post-operative bloods.

Mean haemoglobin by HemoCue was significantly higher than mean day-1 post-operative haemoglobin by laboratory analysis ($111.8 \pm 17.7 \text{ g/L}$ vs $108 \pm 17.5 \text{ g/L}$; $p=0.043$). The data show strong correlation between HemoCue and laboratory haemoglobin measurement ($r=0.74$).

Conclusions

HemoCue can be used reliably for measuring post-operative haemoglobin in hip fracture patients and to help guide transfusion of blood products. Correlation between the two sample types was lower than other studies; however direct comparison is limited by the time delay between sampling in our study.

Further study involving larger sample sizes and consecutive patients could help to further guide the use of HemoCue in this patient population.

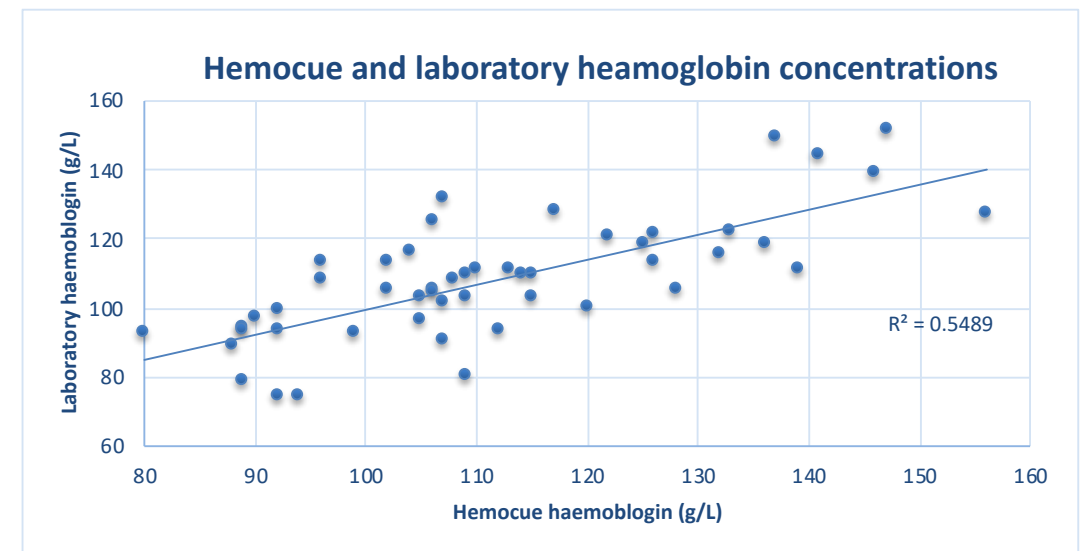


Figure 1. Correlation of post-operative HemoCue and day 1 laboratory haemoglobin concentrations