The Impact of Anticoagulation and Perioperative Blood Transfusion in Fragility Hip Fracture Patients

Mr. M. Greenhalgh, ***Mr. K. P. Iyengar, Mr. R. F. Adam***
Department of Trauma and Orthopaedic Surgery, Southport and Ormskirk NHS Trust

Introduction and Objectives

Transfusions of packed red cells (PRC) are commonly used in the management of trauma. Fragility hip fractures (FHF) of the hip are the most common serious injury in older people, the most common reason for them to receive emergency anaesthesia and surgery and the commonest cause of death following an accident. The timely surgical management of FHFs has been shown to improve outcomes. As an injury that affects older people, many FHF patients are anticoagulated at presentation due to various comorbidities. The emergence and rising popularity of Direct Oral Anticoagulant (DOAC) agents has also presented new challenges in the pre-operative optimisation of FHF patients. Timely surgical intervention must be balanced with bleeding and subsequent risks of PRC transfusions.

This retrospective study examined the use, efficacy and appropriateness of PRC transfusions in 326 FHF patients who presented to a district general hospital in one year against national and trust guidelines. The relationship between PRC transfusion and one-year mortality was investigated. The rate of transfusion between FHF patients taking an anticoagulant agent at presentation was compared to non-anticoagulated FHF patients. Different anticoagulation agents were also compared. The FHF patients most likely to receive a PRC transfusion were identified and grouped by fracture pattern and operation type, with the goal of improving outcomes with earlier intervention.

Methods

We included consecutive FHF patients admitted to Southport and Ormskirk NHS Trust from 1st October 2017 to 31st September 2018 and followed them through their perioperative course. Data was collected retrospectively from the National Hip Fracture Database (NHFD), Electronic Patient Records, Patient Archived Computer System (PACS), local blood transfusion laboratory and discharge summaries.

This included demographics and baseline information such as anticoagulation status (agent, dose, and biochemical levels), fitness for surgery (ASA Grading) and renal function at presentation. Perioperative Haemoglobin (Hb) change and information regarding PRC transfusion was also collected, including if transfusion was administered, timing, location and effect on Hb. Appropriateness of transfusion was assessed against local and national guidelines. Patient's electronic records were reviewed at one year post injury to assess mortality.

Patient Demographics and Comorbidities

Demographics
There were 326 FHF patients admitted during the year studied, 252 female and 74 male, with an average age of 83 years. The average ASA grade of all FHF patients was 2.83.

Anticoagulation
Of the 326 FHF patients, 45 were anticoagulated (13%). Almost half of these patients were on DOACs (Apixaban 20 (44%), Rivaroxaban 2 (4%), Warfarin 23 (51%)).

Comorbidities
The average ASA grade of patients who received a transfusion was 2.9. The average ASA grade of patients who did not receive a transfusion was 2.8

References
Blood Transfusion (NICE Guidelines 24, 18/11/2015)
Joint United Kingdom Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee (JPAC), Handbook of Transfusion Medicine (2013)
Red Blood Cell Transfusion: A Clinical Practice Guideline From the AABB (Carson et al. 2012)
AO Foundation, Fracture and Dislocation Classification Compendium 2018
National Hip Fracture Database
Southport and Ormskirk NHS Trust Mandatory Blood Transfusion Training Module

Results

PRC Transfusion Patient Characteristics
In the FHF patients who received a transfusion, the average presentation Haemaglobin was 110.1g/L. Their average pre-transfusion Haemoglobin was 75.0g/L.

11 out of 45 patients who were anticoagulated at presentation received a blood transfusion (24.4%). 64 out of 281 patients who were not anticoagulated at presentation received a blood transfusion (22.8%)

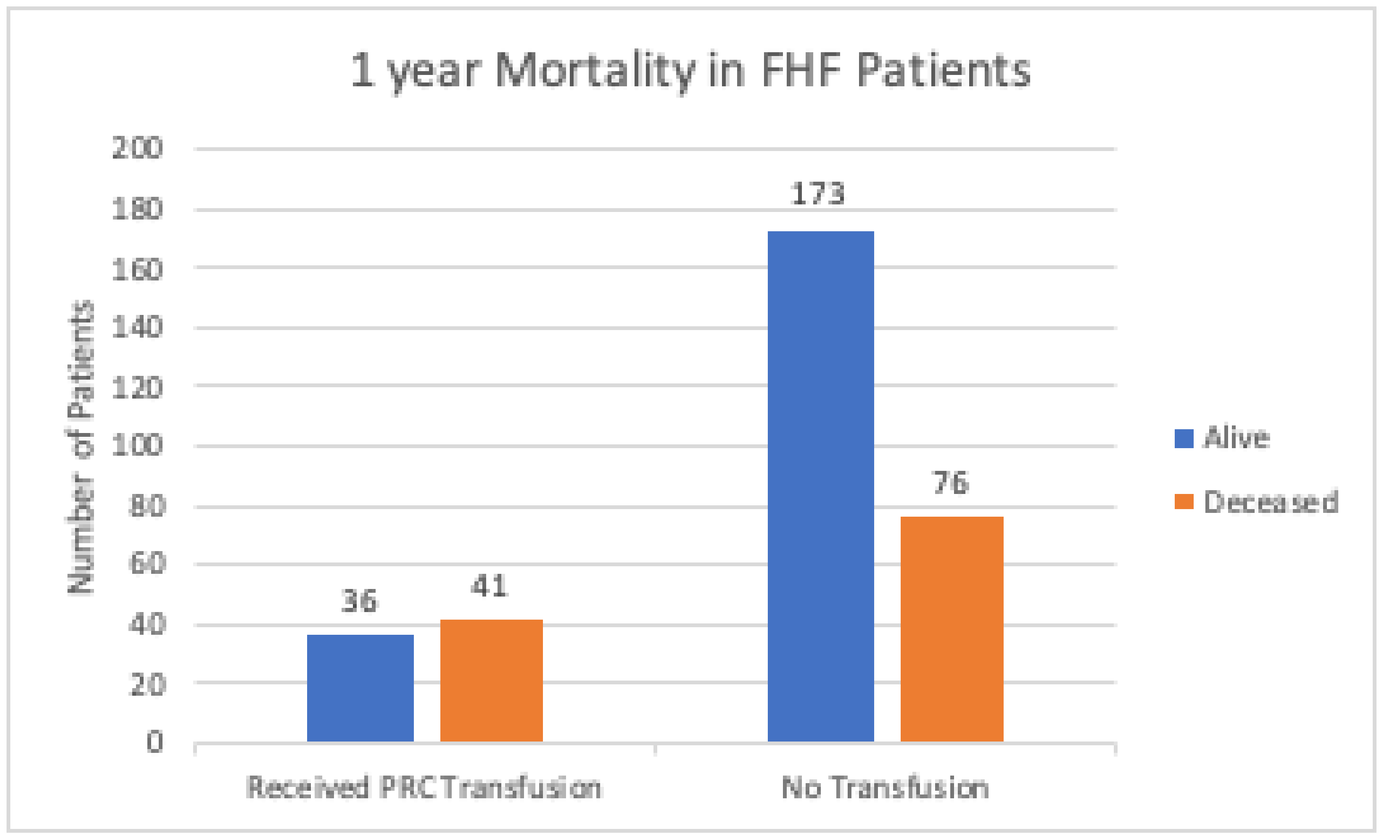
14.8% of intracapsular fractures required transfusion, compared to 34.4% of intertrochanteric fractures and 33.3% of subtrochanteric fractures. Operations for intracapsular fractures were also associated with lower rates of transfusion (18% Hemiarthroplasty, 8.8% Total Hip Replacement) compared to operations for extracapsular fractures (29.3% Dynamic Hip Screw, 45% Short Intramedullary nail, 47% Long Intramedullary Nail).

Appropriateness and Efficacy of PRC Transfusions
67 patients received a PRC transfusion. 56 of these (83.6%) had a pre-transfusion Haemoglobin of below 80 g/L, in keeping with local and national guidance.

The most common number of units transfused was 2 (n=40), followed by 1 (n=18). The average Haemoglobin rise per unit transfused was 11.5g/L.

95.5% (n=64) of PRC transfusions took place on the ward post operatively.

Mortality
The 1 year mortality for FHF patients who did not receive a transfusion was 30.5% (76 of 249), and for those receiving a transfusion was 52% (39 of 75). The expected 1 year mortality following a FHF is approximately one third.



Take Home Points

- We have observed that FHF patients who receive PRC transfusions during their perioperative course have a higher mortality at 1 year post injury (52% versus 30.5%),. This is over the expected rate of approximately one third, with no significant difference in ASA between the two groups.
- Extracapsular fracture patterns and their operations are more likely to be associated with a requirement for PRC transfusion
- Patient who were anticoagulated at presentation were only slightly more likely to require a PRC transfusion (24.4%versus 22.8%)