HIP FRACTURE: BLOOD LOSS IN A VULNERABLE POPULATION

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1. Background

- Hip fractures are one of the most common fractures treated by orthopedic surgeons. With increasing life expectancy, its incidence is expected to rise in the next years. **Elderly patients** are usually osteoporotic, with multiple comorbidities, and are therefore at **high risk of hip fractures and postoperative complications**.¹
- Blood loss is a major issue** in hip fractures and transfusion of blood products is frequently required. Although blood transfusion may be a life-saving intervention, it may increase morbidity, especially bacterial infections, possibly mortality, with substantial costs involved.

2. Methods

• What?

Observational retrospective study

• Who?

N=134 hip fracture patients, who underwent urgent primary surgery. High kinetic trauma, under 18 years old and pregnant patients were excluded.

• When?

From January to December of 2016

• Where?

The study was held in a tertiary teaching hospital in Lisbon – Centro Hospitalar Lisboa Norte, Hospital Santa Maria

• Why?

The primary outcome was administration of blood products.

• How?

Statistical analysis was performed using SPSS software. Significant results were considered when $p < 0.05$.

3. Results

	Blood Products (n=28)	Blood Products (n=106)	p value
Age (SD)	83,9 (11,7)	83,3 (9,2)	0,181
Female gender	26 (92,9%)	71 (70,0%)	0,008
Preoperative Hb (g/dL)	10,72 CI95% 10,19 – 11,24	11,77 CI95% 11,50 – 12,04	<0,001
Previous autonomy			
• Dependent	7 (25,0%)	14 (13,5%)	0,216
• Partially dependent	12 (42,9%)	42 (39,4%)	
• Independent	9 (32,1%)	50 (47,1%)	
Nursing home	7 (25,0%)	17 (16,3%)	0,284
Recent hospitalization	3 (11,1%)	12 (11,6%)	1,000
Comorbidities			
• Dementia	3 (11,1%)	30 (28,7%)	0,081
• Heart failure	6 (21,4%)	30 (28,3%)	0,623
• COPD*	2 (7,1%)	11 (10,4%)	1,000
• DM2	5 (17,9%)	18 (17,0%)	1,000
• Renal disease	7 (25,0%)	19 (18,4%)	0,593

• Demographic and clinical variables analyzed:

✓ Age	✓ Intraoperative minimum blood pressure
✓ Sex	✓ Blood loss
✓ Previous autonomy	✓ Surgery duration
✓ Recent hospitalization	✓ Pre-op Hb
✓ Comorbidities	✓ Pre-op creatinine
✓ Previous dementia	✓ Pre-op albumin
✓ Intraoperative minimum heart rate	✓ Pre-op days of hospitalization
✓ Type of anesthesia	

- Blood products were administered in **23,1%**

- Blood transfusion need** was associated with the following factors:

	OR 95% CI	p value*
Female gender	6,41 (1,44-28,55)	0,008
Pre-operative Hb	0,58 (0,43-0,80)	0,001
Intraoperative minimum heart rate	1,06 (1,03-1,10)	< 0,001
Intraoperative blood loss	1,01 (1,00-1,01)	0,002
Duration of the procedure	1,02 (1,01-1,04)	0,004

*Statistical significance; Hb - hemoglobin

4. Conclusions

- Among the variables associated with blood transfusion requirement, the only modifiable ones were *preoperative Hb*, *intraoperative minimum heart rate*, *intraoperative blood loss* and *duration of procedure*. In this study, **58,9%** of the patients presented with anemia (preoperative Hb < 12g/dL).
- Previous studies have also identified **low** preoperative Hb as a risk factor for transfusion and suggest that only values under 12 g/dL should require crossmatching. Others point that intraoperative blood loss has been associated with delay of surgery, type of fracture and fixing method. Recently the role of intraoperative tranexamic acid in hip fractures is being discussed.²
- More studies are needed to better understand risk factors for blood transfusion in order to minimize associated morbidity and mortality.