

## Background

Anemia is a common, multifactorial condition among elderly patients and associated with harmful consequences regarding hospitalization, morbidity and mortality.

## Purpose

The aim of the study was to assess the prevalence of anemia among elderly, hospitalized patients, and to compare the anemic and non-anemic patient groups to determine the possible predisposing factors of this condition.

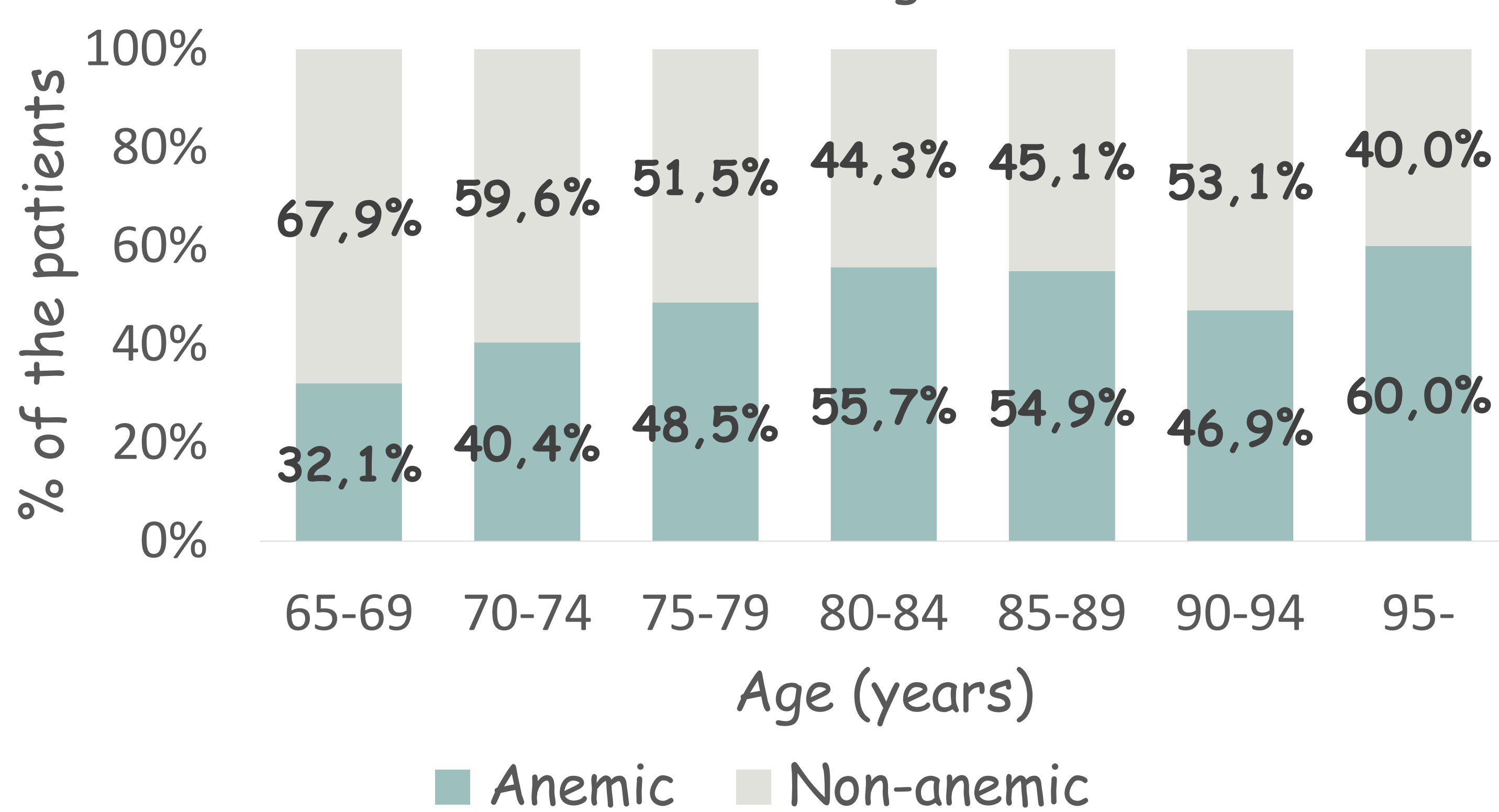
## Materials and Methods

Patients (age  $\geq 65$  years) admitted and operated with low energy, osteoporotic hip fractures during the period of January 2011 and December 2012 were included. Anemia was detected according to WHO criteria (hemoglobin level below 130 g/l in men and below 120 g/l in women). A retrospective analysis was performed on data recorded from the patient charts and documentation, including the following informations: baseline patient characteristics, blood count result before surgery, chronic medications and 3 month mortality.

## Results

421 patients met the inclusion criteria (100 male, 321 female; mean age:  $81.9 \pm 7.3$  years). 211 patients (50.1%) were anemic at admission and 20.8% of the patients had moderate (hemoglobin level below 110 g/l) or severe (hemoglobin level below 80 g/l) anemia. The prevalence of anemia was significantly higher among males, than females (62.0% vs. 46.4%;  $p=0.009^*$ ). Among anemic group female patients more often suffered from moderate or severe anemia than male patients. The presence of anemia was increasing with age.

Anemia and age



Number of patients n(%)	All (421)	Male (100)	Female (321)
NON-ANEMIC	210 (49.9%)	38 (38.0%)	172 (53.6%)
ANEMIC	211 (50.1%)	62 (62.0%)	149 (46.4%)
Mild	123 (29.2%)	44 (44.0%)	79 (24.6%)
Moderate	84 (19.9%)	18 (18.0%)	66 (20.6%)
Severe	4 (0.9%)	0 (0.0%)	4 (1.2%)

	Anemic	Non-anemic	p-value
Number of patients (%)	211	210	-
Female n (%)	149 (70.6%)	172 (81.9%)	0.009*
Male n (%)	62 (29.4%)	38 (18.1%)	
Age (mean $\pm$ SD)	82.8 $\pm$ 6.8	81.2 $\pm$ 7.6	0.023*
Hemoglobin g/l (mean $\pm$ SD)	108.9 $\pm$ 11.5	134.0 $\pm$ 10.5	<0.001*
Blood transfusion n (%)	138 (65.4%)	65 (30.9%)	<0.001*
3 month mortality n (%)	18 (8.5%)	18 (8.6%)	1
Number of chronic medications (mean $\pm$ SD)	7.7 $\pm$ 3.7	6.5 $\pm$ 3.8	0.002*
Polypharmacy n (%)	169 (80.1%)	142 (67.6%)	0.005*
Medication:			
PPI n (%)	77 (36.5%)	55 (26.2%)	0.029*
H2 receptor antagonist n (%)	33 (15.6%)	24 (11.4%)	0.263
Oral anticoagulants n (%)	32 (15.2%)	18 (8.6%)	0.052
Oral iron and folic acid n (%)	11 (5.2%)	8 (3.8%)	0.646
Acetylsalicylic acid n (%)	71 (33.7%)	56 (26.7%)	0.146
NSAID n (%)	24 (11.4%)	14 (6.7%)	0.130
Diuretics n (%)	83 (39.3%)	57 (27.1%)	0.011*
Statins n (%)	63 (29.8%)	40 (19.0%)	0.014*

The prevalence of polypharmacy was 80.1% and anemic patients were taking significantly more chronic medications than non-anemic patients (7.7 vs. 6.5;  $p=0.002^*$ ). Proton pump inhibitor, diuretic and statin use was significantly higher among anemic patients. 65.4% of the anemic patients and 30.9% of the non-anemic patients received blood transfusion during the hospital stay. 36 patients (8.5%) died within 3 months after the hospital admission and there was no difference between anemic and non-anemic groups.

## Conclusions

The prevalence of preoperative anemia was high among studied patients. Although hip fracture itself may slightly contribute to anemia, there can be numerous factors and underlying causes of anemia. It would be important to reveal the potential causes of anemia and treat it accordingly.