

Frailty to predict unplanned hospitalization, stroke, bleeding and death in atrial fibrillation

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PURPOSE

Frailty is a common syndrome and the prevalence is expected to increase further. Little is known about the association between frailty and adverse events in patients with atrial fibrillation (AF).

- To investigate the prevalence of frailty and the association of the frailty index (FI) with unplanned hospitalizations and other adverse events in patients with AF.

METHODS

- Patients with known AF were enrolled in a prospective cohort study in Switzerland. Information on medical history, lifestyle-factors and clinical measurements were collected.
- The primary outcome was unplanned hospitalization, secondary outcomes were all-cause mortality, stroke and bleeding.
- The FI was measured using a cumulative deficit approach,¹ constructed according to previously published criteria and divided into three predefined groups (non-frail, pre-frail, frail).
- The association between frailty and clinical outcomes was assessed using multivariable Cox proportional hazards models.

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Figure - Prevalence of frailty and incidence of adverse outcome across frailty levels in patients with AF.

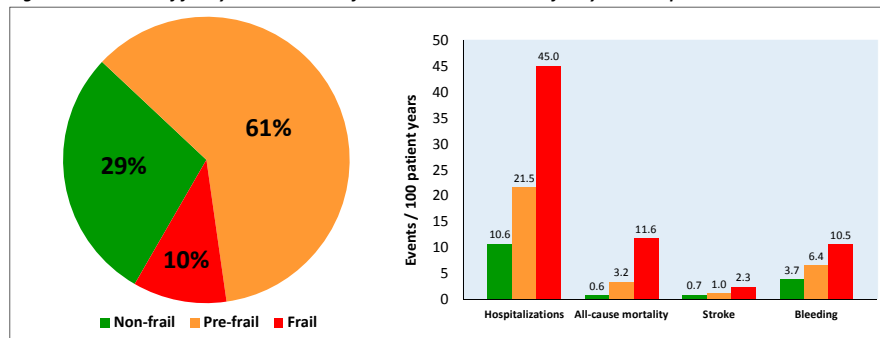


Table – Cox regression analysis for primary and secondary outcomes.

Outcome	Events/ No. of patients	Person-years	Unadjusted HR (95% CI)	P value	Adjusted HR (95% CI)	P value
Hospitalization						
<i>Level of frailty</i>						
Non- frail	135/681	1273	1 [Reference]		1 [Reference]	
Pre- frail	488/1436	2267	2.00 (1.65 - 2.42)	<0.001	1.82 (1.49 - 2.22)	<0.001
Frail	139/252	309	4.10 (3.23 - 5.19)	<0.001	3.59 (2.78 - 4.63)	<0.001
All-cause mortality						
<i>Level of frailty</i>						
Non- frail	8/681	1463	1 [Reference]		1 [Reference]	
Pre- frail	95/1436	2931	5.98 (2.91 - 12.31)	<0.001	5.07 (2.43 - 10.59)	<0.001
Frail	56/252	484	21.51 (10.25 - 45.14)	<0.001	16.72 (7.75 - 36.05)	<0.001
Stroke						
<i>Level of frailty</i>						
Non- frail	10/681	1447	1 [Reference]		1 [Reference]	
Pre- frail	29/1436	2904	1.47 (0.72 - 3.02)	0.3	1.43 (0.67 - 3.06)	0.35
Frail	11/252	476	3.48 (1.48 - 8.20)	0.004	3.29 (1.29 - 8.39)	0.01
Bleeding						
<i>Level of frailty</i>						
Non- frail	52/681	1389	1 [Reference]		1 [Reference]	
Pre- frail	175/1436	2730	1.71 (1.26 - 2.34)	<0.001	1.53 (1.11 - 2.13)	0.01
Frail	46/252	438	2.82 (1.90 - 4.20)	<0.001	2.46 (1.61 - 3.77)	<0.001

Data are presented as hazard ratio (HR) with 95% confidence intervals (CI), reference value is non- frail. Model adjusted for age, sex, mode of oral anticoagulation, any antiplatelet therapy, type of atrial fibrillation, education and smoking. Levels of frailty: frail (frailty index ≥ 0.25), pre- frail (frailty index <0.25 and >0.1), non- frail (frailty index ≤ 0.1).

Reference: 1. Searle SD, Mitnitski A, Gahbauer EA, Gill TM, Rockwood K. A standard procedure for creating a frailty index. BMC Geriatr 2008;8:24.

RESULTS

- We included 2,369 patients. The prevalence of pre-frailty and frailty, and incidence rates of primary and secondary outcomes across frailty levels are presented in the Figure.
- Pre-frailty and frailty were associated with a higher risk of unplanned hospitalizations (adjusted hazard ratio [aHR]: 1.82; 95% confidence interval [CI], 1.49-2.22; $p<0.001$; and aHR: 3.59; 95% CI, 2.78-4.63; $p<0.001$) (Table).
- Both were associated with all-cause mortality (aHR: 5.07; 95% CI, 2.43-10.59; $p<0.001$; and aHR: 16.72; 95% CI, 7.75-36.05; $p<0.001$), and bleeding (aHR: 1.53; 95% CI, 1.11-2.13; $p=0.01$; and aHR: 2.46; 95% CI, 1.61-3.77; $p<0.001$).
- Frailty, but not pre-frailty was associated with the risk of stroke (aHR: 3.29; 95% CI, 1.29-8.39; $p=0.01$; and aHR: 1.43; 95% CI, 0.67-3.06; $p=0.35$).

CONCLUSIONS

- More than two-thirds of AF patients were either pre-frail or frail and these patients had a high risk for unplanned hospitalizations and other adverse events.
- Whether specific diagnostic or therapeutic measures may improve outcomes in the frail and pre-frail patient population will need to be evaluated in future studies.