

Impact of body mass index in newly diagnosed atrial fibrillation in the GARFIELD-AF registry

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BACKGROUND

- Obesity is associated with a high risk of atrial fibrillation (AF), and the association is stronger for sustained than for intermittent AF¹⁻³.
- In patients undergoing AF ablation, freedom from AF after ablation decreases⁴ as body mass index (BMI) increases.

PURPOSE

- To analyze the association between BMI and 2-year outcomes in underweight, normal, overweight, and obese patients with newly diagnosed AF and at least one investigator-defined risk factor for stroke.

METHODS

- GARFIELD-AF is an ongoing, international registry of consecutively recruited patients aged ≥ 18 years with newly diagnosed (≤ 6 weeks' duration) AF (excluding patients with transient AF secondary to a reversible cause) and ≥ 1 investigator-determined stroke risk factor(s)⁵.
- Data were collected prospectively in 28 628 patients from 32 countries enrolled from March 2010 to October 2014.
- We analyzed baseline characteristics, antithrombotic therapy, and 2-year incidence of outcomes according to BMI.
- Hazard ratios were adjusted for anticoagulant treatment as well as baseline characteristics: age, gender, race, smoking, diabetes, hypertension, previous stroke, previous bleeding, congestive heart failure (CHF), vascular disease, moderate-to-severe chronic kidney disease (CKD), type of atrial fibrillation, and alcohol consumption.

RESULTS

PATIENT CHARACTERISTICS

- BMI data were available for 22 541 patients, stratified as: underweight [BMI < 20 kg/m²] (3.3%), normal [BMI 20 to < 25 kg/m²] (25.3%), overweight [BMI 25 to < 30 kg/m²] (40.3%), obese [BMI 30 to < 35 kg/m²] (20.1%), and morbidly obese [BMI ≥ 35 kg/m²] (11.1%).
- Increasing BMI was associated with younger age and higher rates of history of hypertension, hypercholesterolemia, type 2 diabetes, coronary artery disease, and CHF (Table 1).
- However, underweight patients had the highest prevalence of prior stroke/transient ischemic attack and bleeding.
- The proportion of patients with CHF who were in New York Heart Association Class III/IV was similar in the morbidly obese and underweight groups.

Table 1. Baseline characteristics of patients according to body mass index

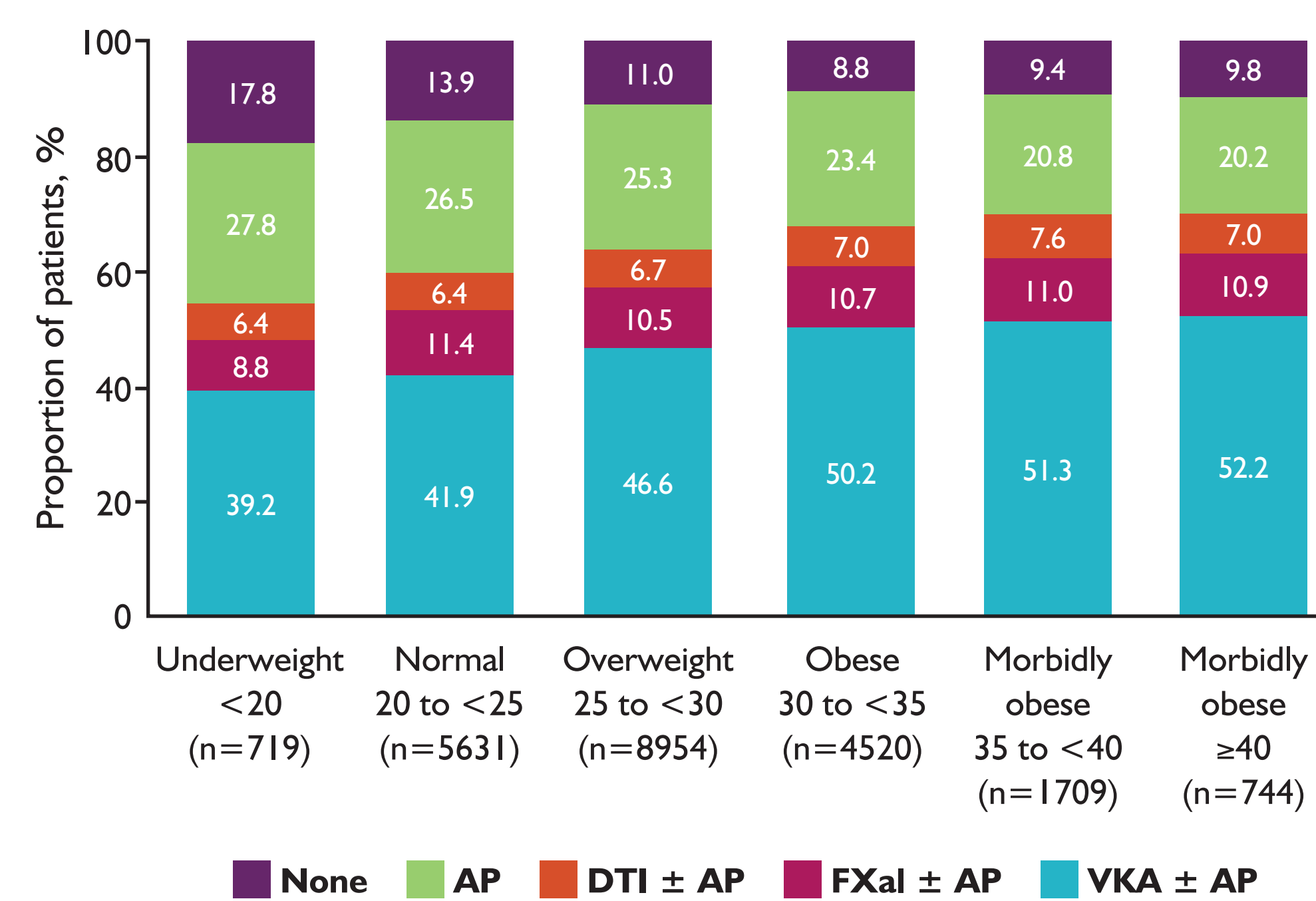
	Underweight <20 (n=735)	Normal 20 to <25 (n=5702)	Overweight 25 to <30 (n=9074)	Obese 30 to <35 (n=4520)	Morbidly obese	
					35 to <40 (n=1748)	≥ 40 (n=762)
Age at diagnosis, years, median (IQR)	76 (68 to 82)	73 (64 to 80)	71 (62 to 78)	69 (62 to 76)	67 (61 to 74)	64 (57 to 71)
History of hypertension, %	57.8	69.6	79.0	86.6	89.0	89.6
Hypercholesterolemia, %	22.8	31.2	42.7	51.0	52.3	51.1
Type 2 diabetes, %	9.0	14.1	19.7	27.5	34.6	41.6
CAD, %	19.2	18.1	21.9	24.2	24.8	19.6
Moderate-to-severe CKD, %	12.1	11.5	9.8	10.0	11.3	11.2
Prior stroke/TIA, %	14.7	12.7	12.3	9.4	10.2	9.6
History of bleeding, %	4.1	2.9	2.6	2.6	3.4	2.0
CHF, %	23.4	19.4	19.4	24.0	29.1	30.2
NYHA class III/IV	34.9	31.5	29.5	30.0	35.9	39.2
CHA ₂ DS ₂ -VASc, mean (SD)	3.4 (1.6)	3.2 (1.6)	3.1 (1.6)	3.2 (1.6)	3.4 (1.6)	3.2 (1.5)

CAD, coronary artery disease; CHF, congestive heart failure; CKD, chronic kidney disease; IQR, interquartile range; NYHA, New York Heart Association; SD, standard deviation; TIA, transient ischemic attack.

ANTITHROMBOTIC THERAPIES

- Obese patients were more likely to receive oral anticoagulants and less likely to receive only antiplatelet therapy compared with underweight patients (Figure 1).

Figure 1. Antithrombotic therapy at diagnosis according to body mass index



AP, antiplatelet; DTI, direct thrombin inhibitor; FXa, factor Xa inhibitor; VKA, vitamin K antagonist.

CLINICAL OUTCOMES

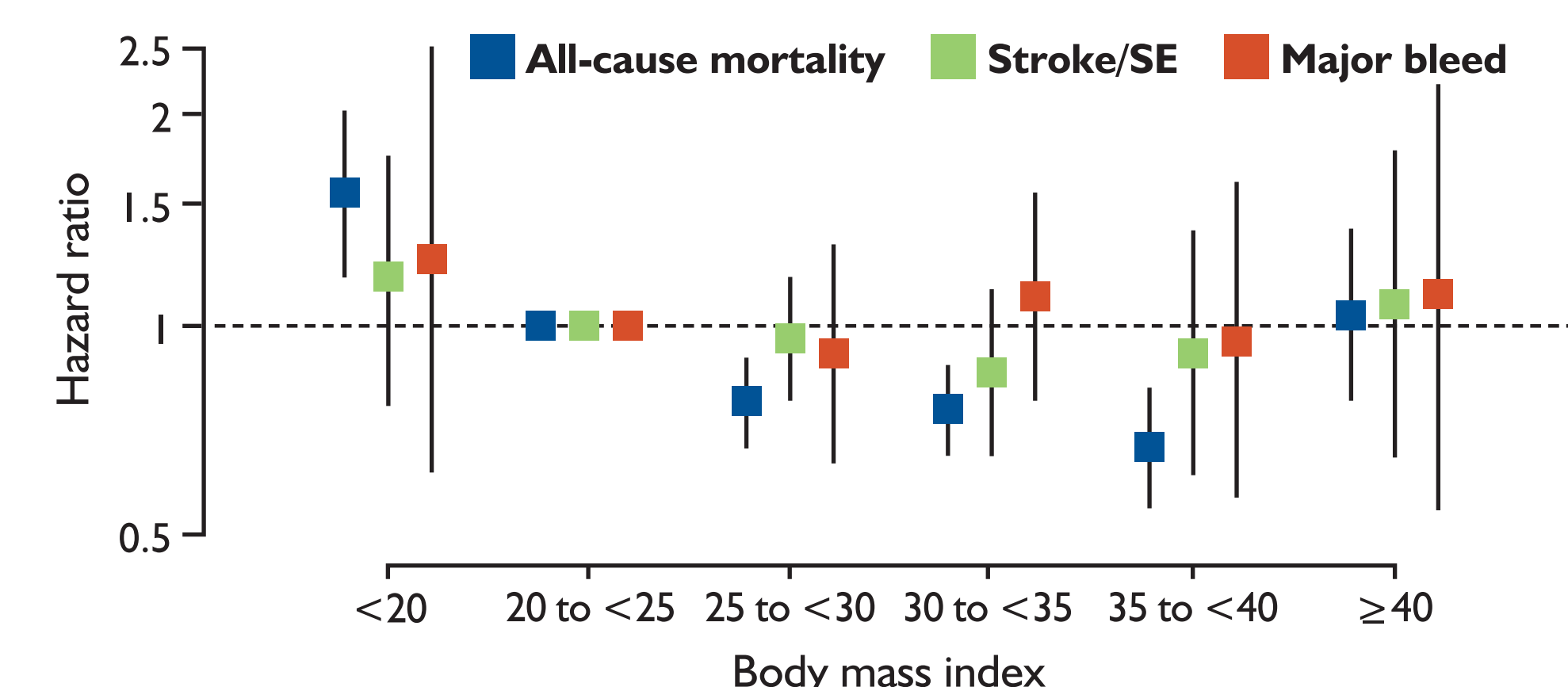
- Crude 2-year incidence rates of outcomes are shown in Table 2.

Table 2. Incidence event rates during 2-year follow-up according to body mass index

Rate per 100 person-years (95% confidence interval)	Underweight <20 (n=735)	Normal 20 to <25 (n=5702)	Overweight 25 to <30 (n=9074)	Obese 30 to <35 (n=4520)	Morbidly obese	
					35 to <40 (n=1748)	≥ 40 (n=762)
Stroke/systemic embolism	2.00 (1.34; 2.98)	1.37 (1.16; 1.62)	1.33 (1.16; 1.52)	1.07 (0.87; 1.32)	1.25 (0.92; 1.71)	1.30 (0.82; 2.06)
Major bleeding	0.99 (0.56; 1.75)	0.66 (0.52; 0.84)	0.63 (0.52; 0.76)	0.83 (0.66; 1.06)	0.59 (0.38; 0.93)	0.65 (0.34; 1.24)
All-cause mortality	8.71 (7.20; 10.53)	4.50 (4.10; 4.93)	3.32 (3.05; 3.61)	3.13 (2.77; 3.53)	2.88 (2.35; 3.53)	4.15 (3.21; 5.36)

- There was a higher mortality in underweight patients and lower mortality in high BMI patients (up to BMI 40 kg/m²) compared with normal weight patients. This pattern persisted after adjustment for baseline factors (Figure 2).

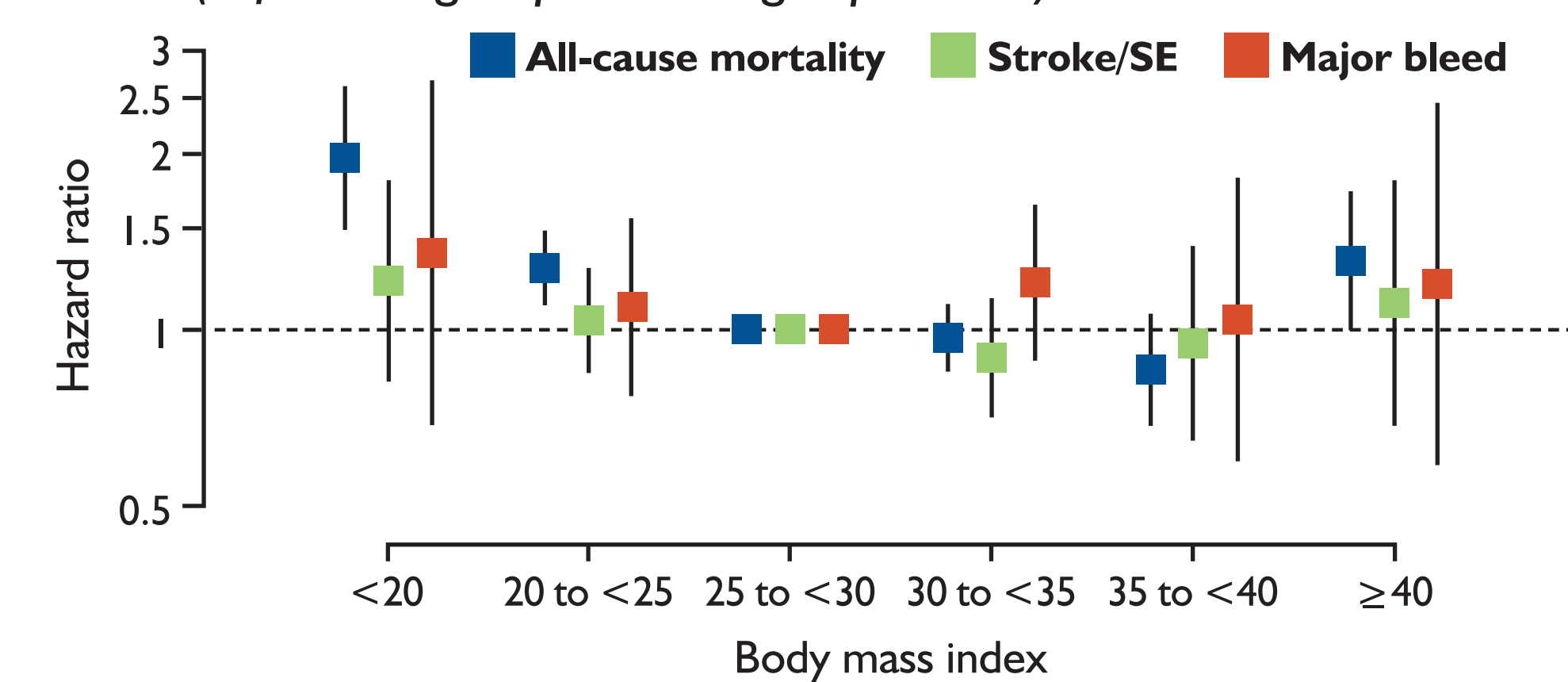
Figure 2. Adjusted hazard ratios for 2-year outcomes by body mass index (reference group: normal weight patients)



SE, systemic embolism.

- Compared with overweight patients, those with low BMI (up to 25 kg/m²) had higher mortality even after adjustment for baseline factors (Figure 3).

Figure 3. Adjusted hazard ratios for 2-year outcomes by body mass index (reference group: overweight patients)



SE, systemic embolism.

- In the underweight, 48.8% of deaths were due to cardiovascular events, while the proportion was 63.8% in patients with BMI ≥ 40 kg/m².

CONCLUSIONS

- Seventy-one percent of GARFIELD-AF patients with a new diagnosis of AF were either overweight or obese.
- Patients with morbid obesity were younger than patients of normal weight when diagnosed with AF.
- As BMI increased (up to 40 kg/m²), mortality decreased in GARFIELD-AF.
- Underweight patients had the highest risk of all events during the 2 years of follow-up after AF diagnosis. In these patients, non-cardiovascular causes of death were more frequent than in the obese patients.

CLINICAL IMPLICATIONS

- GARFIELD-AF exhibits the "obesity paradox" in a large population enrolled throughout the world.
- Obese patients in GARFIELD-AF have a lower mortality rate than patients of normal weight.

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DECLARATION OF INTEREST

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