Association of body mass index with mortality and its causes in patients with atrial fibrillation: The Fushimi AF Registry

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**Introduction**: The inverse relationship of body mass index (BMI) to mortality, so-called “obesity paradox”, is well-known among patients with cardiovascular disease and has also been observed in recent reports among patients with atrial fibrillation (AF). However, data regarding the relationship between BMI and specific causes of death in AF patients remain scarce.

**Methods**: The Fushimi AF Registry is a community-based prospective survey of AF patients in Fushimi-ku, Kyoto. The inclusion criterion for the registry is the documentation of AF at 12-lead electrocardiogram or Holter monitoring at any time. We started to enroll patients from March 2011, and baseline characteristics including BMI and follow-up data were available for 3,805 patients by the end of November 2018. Patients were categorized into 3 groups depending on the BMI value; underweight (<18.5 kg/m²; 419 patients), normal (18.5 to <25.0 kg/m²; 2,283 patients), overweight (= or <25.0 kg/m²; 1,103 patients).

**Result**: In the entire population, the mean BMI level was 23.1±4.0 kg/m². The lower BMI was associated with higher age (78.5±10.3, 74.0±10.3, and 71.3±10.9 years in Underweight, Normal, and Overweight, respectively; p<0.001) and with higher prevalence of various comorbidities and CHA2DS2-VASc scores (3.83±1.67, 3.43±1.70, and 3.29±1.64, p<0.001). Oral anticoagulants were less frequently prescribed in those with lower BMI (46%, 56%, and 58%, p<0.001). During a median follow-up of 1,464 days (interquartile range: 727-2,228 days), all-cause mortality was lower in accordance with higher BMI (14.3, 5.3, and 3.5 per 100 person-years, respectively; p<0.001). In terms of specific causes of death, the event rate of infection was prominently higher in the Underweight group than the others (3.7, 0.9, and 0.5, per 100 person-years, respectively; p<0.001) (Figure). In each age subgroup, the mortality due to infection was consistently higher in Underweight than in the others. Cox models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) of the BMI value for mortality, adjusted by age, sex, chronic kidney disease, anemia, chronic obstructive pulmonary disease, history of major bleeding, and other components of CHA2DS2-VASc score. Higher BMI was related to lower all-cause mortality (per 5 kg/m² increase: HR 0.71 [95% CIs 0.63-0.78], p<0.001), and also lower mortality due to infection (per 5 kg/m² increase: HR 0.48 [95% CIs 0.37-0.61], p<0.001).

**Conclusion**: In a Japanese community-based AF cohort, obesity paradox was also observed on all-cause mortality. In particular, lower BMI was strongly associated with the higher mortality due to infection, regardless of age.