Abstract: Obesity, myocardial function, geometry, and prognosis in acute heart failure

Authors: C S Park¹, JJP Park², JJP Park², J-HP Park³, G-YC Cho², YEY Yoon², Y-JC Choi¹, ¹Seoul National University Hospital, Cardiovascular Center - Seoul - Korea Republic of, ²Seoul National University Bundang Hospital, Cardiovascular center - Seongnam - Korea Republic of, ³Chungnam National University Hospital - Daejeon - Korea Republic of,

Topic(s): Echocardiography: Systolic and Diastolic Function

Citation: European Heart Journal - Cardiovascular Imaging (2019) 20 (Supplement 1), i331

Funding Acknowledgements: None

Background/Introduction: Left ventricular-ejection fraction (LV-EF) may not accurately reflect LV systolic function in obese subjects, who frequently have altered LV geometry.

Purpose: To explore whether myocardial function and structure, assessed by left ventricular (LV)-global longitudinal strain (GLS) and LV geometry, can explain the protective association of body mass index (BMI) with mortality in patients with acute heart failure (HF) and be used to improve risk prediction in this population.

Methods: We enrolled 2021 overweight-to-obese (BMI =23 kg/m²) and 1543 normal-weight patients with acute HF admitted from January 2009 to December 2016 with a median follow-up of 33.7 months. LV-GLS, LV-ejection fraction, LV geometry, and conventional echocardiographic measures were obtained. The primary outcome was all-cause mortality.

Results: Compared with normal-weight patients with HF, overweight-to-obese patients had a lower proportion of eccentric hypertrophy (62.4% vs. 49.1%, p<0.001), where the mean LV-GLS value and survival rate were lowest among LV geometric patterns. Higher BMIs were associated with lower mortality risks overall and in all subgroups according to LV-GLS or LV geometry, with a relatively steeper association among patients with high LV-GLS than in those with low LV-GLS. Overweight-to-obese patients with high LV-GLS had the lowest mortality risk (29.2%); normal-weight patients with high LV-GLS (40.6%), overweight-to-obese patients with low LV-GLS (39.0%), and normal-weight patients with low LV-GLS (50.6%) had progressively greater risks (p for trend <0.001). Patients with metabolically healthy obesity had better survival than those with metabolically unhealthy obesity (log-rank p<0.001), metabolically healthy normal-weight (log-rank p=0.001), and metabolically unhealthy normal-weight (log-rank p<0.001).

Conclusions: Overweight-to-obese patients with HF have distinct echocardiographic characteristics, such as less deterioration in myocardial function and LV geometry, compared with normal-weight patients, which may provide insights into the mechanisms underlying the protective effect of higher BMI in HF patients. Metabolically healthy obese patients may have better survival than those with metabolically unhealthy obesity, suggesting potential therapeutic implications of targeting metabolic abnormalities in this population.
Background/Introduction: Left ventricular-ejection fraction (LV-EF) may not accurately reflect LV systolic function in obese subjects, who frequently have altered LV geometry.

Purpose: To explore whether myocardial function and structure, assessed by left ventricular (LV)-global longitudinal strain (GLS) and LV geometry, can explain the protective association of body mass index (BMI) with mortality in patients with acute heart failure (HF) and be used to improve risk prediction in this population.

Methods: We enrolled 2021 overweight-to-obese (BMI = 23 kg/m²) and 1543 normal-weight patients with acute HF admitted from January 2009 to December 2016 with a median follow-up of 33.7 months. LV-GLS, LV-ejection fraction, LV geometry, and conventional echocardiographic measures were obtained. The primary outcome was all-cause mortality.

Results: Compared with normal-weight patients with HF, overweight-to-obese patients had a lower proportion of eccentric hypertrophy (62.4% vs. 49.1%, p<0.001), where the mean LV-GLS value and survival rate were lowest among LV geometric patterns. Higher BMIs were associated with lower mortality risks overall and in all subgroups according to LV-GLS or LV geometry, with a relatively steeper association among patients with high LV-GLS than in those with low LV-GLS. Overweight-to-obese patients with high LV-GLS had the lowest mortality risk (29.2%); normal-weight patients with high LV-GLS (40.6%), overweight-to-obese patients with low LV-GLS (39.0%), and normal-weight patients with low LV-GLS (50.6%) had progressively greater risks (p for trend <0.001). Patients with metabolically healthy obesity had better survival than those with metabolically unhealthy obesity, metabolically healthy normal-weight, and metabolically unhealthy normal-weight (log-rank p<0.001, log-rank p=0.001, and log-rank p<0.001, respectively).

Conclusions: Overweight-to-obese patients with HF have distinct echocardiographic characteristics, such as less deterioration in myocardial function and LV geometry, compared with normal-weight patients, which may provide insights into the mechanisms underlying the protective effect of higher BMI in HF patients. Metabolically healthy obese patients may have better survival than those with metabolically unhealthy obesity, suggesting potential therapeutic implications of targeting metabolic abnormalities in this population.