**Introduction**: Previous studies had shown the impact of body mass index (BMI) on clinical outcomes of ischemic cardiomyopathy (ICM) patients with implantable cardioverter defibrillator (ICD). But little is known about the impact of BMI on on clinical outcomes of non-ischemic cardiomyopathy (NICM) patients with ICD.

**Methods**: This study retrospectively analyzed the data from the Study of Home Monitoring System Safety and Efficacy in Cardiac Implantable Electronic Device–implanted patients (SUMMIT) registry in China. 480 NICM patients with ICD having BMI data were enrolled. Patients were divided into four groups according to the native recommended BMI classification: underweight (BMI < 18.5 kg/m²), normal range (BMI, 18.5–24 kg/m²), overweight (BMI, 24–28 kg/m²), obese (≥28 kg/m²). Those classified as underweight or obese made up 9.3% (underweight, 4.3%; obese, 5%) of the study population and were excluded from the analysis, leaving a total of 435 patients. The primary endpoint was all-cause mortality. The secondary endpoint was appropriate ICD therapy for VT/VF and appropriate ICD shock for VT/VF.

**Result**: Of 435 patients, 261 (60%) had normal BMI, 174 (40%) were overweight. Over a median follow-up time of 57.7 months, 63 patients (14.5%) died, 158 patients (36.3%) experienced appropriate ICD therapy for VT/VF, 102 patients (23.4%) were treated with appropriate ICD shock. In the Kaplan-Meier analyses, overweight had an decreased risk of mortality compared with normal range (log-rank test P = 0.024; \( \chi^2 = 5.028 \)). Based on multivariate Cox regression modeling, overweight still had a decreased risk of mortality compared with normal range (HR = 0.512, 95% CI 0.292–0.898, \( p = 0.019 \)). However, the risk of appropriate ICD therapy or shock for VT/VF was similar between overweight and normal range patients (HR = 0.918, 95% CI 0.734–1.409, \( p = 0.918 \); HR = 1.081, 95% CI 0.721–1.621, \( p = 0.706 \) respectively).

**Conclusion**: Compared with normal range, overweight is a protective factor against mortality, but has no impact on ventricular arrhythmias in NICM patients with ICD.