Baseline Serum High Density Lipoprotein Cholesterol Level Predicts Long-term Clinical Outcomes in Patients with Heart Failure Receiving Cardiac Resynchronization Therapy

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Introduction: Cardiac resynchronization therapy (CRT) is the current standard of care for patients with refractory heart failure and ventricular dyssynchrony. However, approximately 30% of patients may not benefit from CRT, despite meeting criteria for implantation.

Methods: A total of 512 patients with CRT between January 2010 and December 2015 were retrospectively enrolled and categorized into 2 groups based on serum HDL-C level (HDL-C $\geq$1.0 mmol/L, <1.0 mmol/L). After the follow-up, re-hospitalization due to worsening heart failure (HF) or all-cause mortality (including heart transplantation) was analyzed using Kaplan-Meier curves and log-rank test. Serum HDL-C level was evaluated in Cox proportional-hazards regression models as an independent prognostic factor.

Result: There were 267 (52.1%) patients with lower HDL-C which had lower cholesterol, proportion prescribed with spironolactone, had higher body mass index, higher proportion of hypertension, diabetes, high-sensitivity C reactive protein, and had lower serum Cholesterol. During a median follow-up period of 36.1±26.0 months, 95 (19.3%) patients died, 7 (1.4%) underwent heart transplantation and 137 (27.8%) had at least one HF readmission. Log-rank test analyses demonstrated that lower HDL-C was associated with a significantly higher HF re-hospitalization ($\chi^2$ = 4.876, $p$ = 0.027) and all-cause mortality ($\chi^2$ = 4.267, $p$ = 0.039). Cox analysis showed that lower HDL-C was the independent risk factor for HF re-hospitalization (hazard ratio [HR] = 0.301, 95% confidence interval [CI]: 0.150-0.604, $p$ = 0.001) and all-cause mortality (HR = 0.193, 95% [CI]: 0.080-0.470, $p$ = 0.006).

Conclusion: In CRT patients, baseline serum HDL-C level was associated with clinical condition. HDL-C level was the independent risk factor for HF re-hospitalization and all-cause mortality.