Effects of treatment response on echocardiographic features among patients with light-chain cardiac amyloidosis

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Background: Complete response to treatment for light chain cardiac amyloidosis (AL-CA) may lead to improvement of myocardial function. The aim of this study was to evaluate the effect of treatment for AL-CA on echocardiographic characteristics of patients, and the prognostic impact of changes in longitudinal strain and myocardial work.

Methods: The study population comprised of sixty-one patients treated for AL between 2020 and 2022. All patients underwent comprehensive echocardiographic assessment including longitudinal strain and myocardial work imaging at baseline and at 1-year follow-up. Patients were stratified according to the depth of hematologic response to treatment for AL-CA as complete or not complete responders. The relationship between echocardiographic parameters and all-cause mortality was assessed by Kaplan Meir curves and cut-off points were selected using ROC analysis.

Results: A significant reduction in median NT-proBNP (from 2,771 to 1,486 pg/mL; p<0.001), posterior wall thickness (PWT) (from 13 to 12mm; p=0.002), and an increase in global work index (GWI) (from 1,115 to 1,356 mmHg%; p=0.018) was observed in all patients at 1-year follow up. After stratifying patients based on hematologic response to treatment, patients with complete response (CR) had a more pronounced decrease in intraventricular septum thickness (14.2 to 12.0mm; p=0.006), a trend towards improved global longitudinal strain (GLS) (-11.6 to -13.1%; p=0.064) and increased global constructive work (1,245 to 1,436 mmHg%; p=0.008), in addition to significant improvements in NT-proBNP, posterior wall thickness and global work index. Furthermore, the delta GLS (ρspearman=0.35; p<0.001) and delta GWI (ρspearman=−0.32; p=0.02) significantly correlated with delta NT-proBNP. Patients with GWI response, either any response or ROC-curve derived cut-off, had a better prognosis compared with patients without GWI response (log-rank p=0.043 and log-rank p=0.035, respectively).

Conclusions: Among patients treated for AL-CA, those with hematologic CR exhibited significant improvement in GWI and GWW. Additionally, our results indicate that GLS and GWI may have prognostic value in predicting survival among AL-CA patients and their changes correlate to NT-proBNP decrease.