

Pathological Correlates and Outcomes from Treatment of Cardiac Light Chain (AL) Amyloidosis

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Purpose

Cardiac events (CE) are the leading cause of morbidity and mortality in AL patients. We examined whether baseline characteristics, cardiac biopsy histology or treatment is predictive of differences in CE in cardiac AL.

Methods

Outcomes of 49 cardiac AL patients from 2008-2015 are described. Cardiac involvement was clinically suspected (n=30) or biopsy-proven (n=19). A Composite Cardiac Injury Score (CCIS) for each biopsy was derived based on a Fibrosis Score (FS) and Amyloid Score (AS). FS was calculated by amount of fibrosis. AS was determined by distribution and extent of amyloid. Outcomes included hematological (HR) and cardiac response (CR) defined by consensus guidelines.

Results

Baseline cardiac characteristics are described (Table 1). Treatment was bortezomib-based in 82% (n=40), melphalan-based in 4% (n=2) and immunomodulatory drug-based in 4% (n=2) with autologous stem cell transplant (AHCT) pursued after induction in 47% (n=23). AHCT alone was used in 10% (n=5). HR (\geq partial response) occurred in 67% (n=33) and CR in 58% (n=21). After diagnosis, 61% (n=30) had at least one CE (Table 2). Median time from treatment start to CE was 7 months. There was no observed difference in treatment received and CE incidence (p=0.06). Those more likely to have CE were male (p<0.01), have higher plasma cell burden (p=0.02) and no renal response (p<0.01). Higher median CCIS was associated with increased CE frequency (p=0.002). HR was associated with lower CE incidence (p=0.04). There were 21 deaths, mostly from disease progression (n=8).

Conclusions

CE are common in patients with AL. Despite limited sample size, outcomes associated with a biopsy-based injury score is compelling and warrants further analysis for the ability of biopsy data to predict cardiac AL patient outcomes.

Table 1. Characteristics

	N=49
Age, years, median (range)	60 (52-67)
Troponin I, ng/ml	0.1 (0-3.02)
BNP, pg/ml	509 (241-828)
Ejection fraction, %	57 (55-63)
Cardiac stage III,* n (%)	24 (59)
NYHA III/IV	23 (47)

*abnormal troponin & BNP

Table 2. CE

	N=53 (%)
Heart failure (HF)	16 (33)
HF requiring orthotopic heart transplant	1 (2)
Arrhythmia	18 (37)
Cardiac device implanted	7 (14)
Cardiac arrest	5 (10)
Venous thromboembolism	4 (8)
Myocardial infarction	1 (2)