Echocardiographic systolic and diastolic function alterations in multiple myeloma patients treated with Carfilzomib

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Background: Carfilzomib improves the prognosis of multiple myeloma (MM) patients, but significantly increases cardiovascular toxicity. The timing and effect of carfilzomib therapy on left ventricular function is still under investigation.

Purpose: We sought to assess the echocardiographic systo-diastolic changes, including global longitudinal strain (GLS), in patients treated with carfilzomib and to identify predictors of increased risk of cardiovascular adverse events (CVAEs) during therapy.

Methods: 88 patients with MM performed a baseline cardiovascular evaluation comprehensive of transthoracic echocardiogram (TTE) before the start of Carfilzomib therapy and after about 6 months. All patients were clinically followed-up to early identify the occurrence of CVAEs for the whole therapy duration.

Results: After Carfilzomib treatment, mean GLS slightly decreased (-22.2% ± 2.6 vs -21.3% ± 2.5; $p < 0.001$). 58% of patients experienced CVAEs during therapy: 71% of them had uncontrolled hypertension, 29% had major CVAEs or CV events not related to arterial hypertension. GLS variation during therapy was not related to an increased risk of CVAEs; however, patients with baseline GLS ≥ -21% and/or left ventricular ejection fraction (LVEF) ≤ 60% had an increased risk of major CVAEs (OR = 6.2, $p = 0.004$; OR = 3.7, $p = 0.04$, respectively). Carfilzomib led to an increased risk of diastolic dysfunction (5.6% vs 13.4% $p = 0.04$) and to a rise in E/e' (8.9 ± 2.7 vs 9.7 ± 3.7; $p = 0.006$).

Conclusions: Carfilzomib leads to early LV function impairment early demonstrated by GLS changes and diastolic dysfunction. Baseline echocardiographic parameters, especially GLS and LVEF, might improve cardiovascular risk stratification before treatment.