IMPACT OF EPOETIN ALFA ON LV STRUCTURE, FUNCTION, AND PRESSURE-VOLUME RELATIONS AS ASSESSED BY CARDIAC MAGNETIC RESONANCE - THE HEART FAILURE PRESERVED EJECTION FRACTION (HFPEF) ANEMIA TRIAL

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Background: Anemia is a common co-morbidity in older adults with heart failure and a preserved ejection fraction (HFPEF) and is associated with worse outcomes. We quantified the effect of anemia treatment on left ventricular (LV) structure and function as measured by cardiac magnetic resonance (CMR) imaging.

Methods: As part of an ongoing prospective, randomized single blind clinical trial (NCT NCT00286182) comparing the safety and efficacy of epoetin alfa versus placebo for 24 weeks, we conducted a sub-study to evaluate changes in cardiac structure and function determined by cardiac MRI at baseline and after 3 and 6 months. PV indices were derived from MRI measures of LV volume coupled with sphygmomanometer-measured pressure and Doppler estimates of filling pressure. The end-systolic and end-diastolic PV relations and the area between them as a function of end-diastolic pressure, the isovolumic PV area (PVa-iso-EDP at 30 mmHg), were calculated.

Results: 22 subjects (75±10 years, 64% female) with HFPEF (EF=63±15%) with average hemoglobin of 10.3±1.1 g/dl at baseline were treated with epoetin alfa using a dose adjusted algorithm that increases hemoglobin ~0.8 g/dl compared to placebo (p<0.0001) throughout the study period. As compared to baseline values, there were no significant changes in end diastolic (-7±8 vs. -3±8 ml, p=0.81) or end systolic (-0.4±2 vs. -0.7±5 ml, p=0.96) volumes at 6 month follow-up between epoetin alfa compared with placebo. Similarly, LV systolic function was similar, as measured based on EF (-1.5±1.6% vs. -2.6±3.3%, p= 0.91) and pressure volume indices (PVa-iso-EDP at 30 mmHg, -5071±4308 vs. -1662±4140 p=0.58) did not differ between epoetin alfa and placebo.

Conclusions: Administration of epoetin alfa to older adult patients with HFPEF resulted in a significant increase in hemoglobin, without evident change in LV structure, function, or pressure volume relationships as measured quantitatively using CMR.