Evaluation of the feasibility of utilizing the H/CL ratio with HMDP/HDP cardiac amyloid imaging

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Background: Repetitive PYP shortages in the US have many labs alternating between Tc-99m labelled PYP and HDP for the diagnosis of cardiac amyloid. Studies have not identified a cutoff for the H/CL ratio with HDP when used to diagnose ATTR cardiac amyloid due to issues with soft tissue HDP uptake.

Purpose: We sought to assess the use of the commonly used H/CL ratio cutoff of 1.5 with HDP in the diagnosis of ATTR cardiac amyloid.

Methods: In a retrospective study, consecutive patients undergoing cardiac amyloid imaging with HDP were assessed. All were imaged and interpreted utilizing planar, SPECT, and CT imaging at 2 hours post injection. Patients were divided into positive and negative studies based on grade 2 or 3 myocardial uptake on fused SPECT/CT images. A final clinical diagnosis of ATTR cardiac amyloidosis, including testing for monoclonal gammopathy, was confirmed by chart review. Planar images were analyzed for counts in the heart and contralateral lung to calculate a H/CL ratio.

Results: A total of 274 patients were imaged with HDP during the study period. A total of 44 positive studies (16.1% of the total) (mean age 81.3 years, 75% male) and 66 negative studies (mean age 73.4 years, 59% male) were analyzed. The mean H/CL ratio for positive HDP studies was 1.9 ± 0.38 and 1.09 ± 0.12 for negative studies (p < 0.0001). 100% (66/66) of the negative studies had a H/CL ratio below 1.5 and 43/44 (97.7%) of positive studies had a H/CL ratio above 1.5. The one outlier had a H/CL ratio of 1.45 (88 yo female with moderate LVH, heart failure with mild LV dysfunction, LBBB, and paroxysmal atrial fibrillation).

Conclusion: Utilization of a H/CL ratio on HDP planar imaging with a similar cut-off to PYP would also seem to be reasonable as the vast majority of positive ATTR patients had a H/CL ratio above 1.5 with HDP. Quantification of HDP would seem to be feasible and accurate.