Cardiac MRI in the Diagnosis and Management of Asymptomatic Cardiac Involvements in Rheumatic Diseases.

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Purpose: Cardiac involvements such as myocarditis and myocardial fibrosis are observed in rheumatic diseases, which are important factors influencing prognosis. Although clinical symptoms are often silent, potentially life-threatening manifestations are well known. Cardiac MRI has been used to non-invasively detect myocardial abnormalities in ischemic and non-ischemic heart diseases. The purpose is to review the clinical cardiac involvements and typical pathophysiological findings of rheumatic diseases, to demonstrate cardiac MRI findings in asymptomatic patients of rheumatic diseases, and to discuss the role of cardiac MRI in clinical situations including biological drug therapies.

Methods: Subjects were the asymptomatic rheumatic disease patients (18RA, 10 SSc and 16 SLE for perfusion and delayed enhancement, and 28 RA, 19 SSc and 10 normal volunteers for regional function analysis). We performed complementary cardiac MRI with Cine MRI, Stress / Rest Perfusion MRI and Delayed Enhancement (DE). We discussed about the role of cardiac MRI and correlated the MRI findings with disease activity and clinical settings in the rheumatic diseases patients without cardiac symptoms.

Summary: 1) Perfusion and Delayed Enhancement (Table):

	PD (stress)	DE	Both PD and DE
RA(18)	2/18 (11%)	7/18 (39%)	1/18 (6%)
SSc(10)	6/9 (67%)	4/10 (40%)	3/9 (30%)
SLE(16)	7/16 (44%)	6/16 (33%)	8/16 (5%)

-RA: Mean disease activity score (DAS)28 was significantly higher in the group with DE compared to the group without by an average of 1.32 DAS28 units (4.77 vs. 3.44 units, $p = 0.011$).

2) Regional Function (feature tracking analysis): -RA: Mean peak Err(radial strain,%) showed lower contraction in RA patients than in controls, but the difference was not quite statisitically significant ($p=0.076$). Mean peak Err in the non-biological DMARDs group was significantly lower than in the controls ($p=0.048$), and there were no significant difference in mean peak Err between the biologics and the controls. -SSc: The mean peak Err was significantly lower in the SSc patients than the controls ($p=0.008$). Comprehensive Cardiac MRI with Cine, Perfusion and DE are very useful to assess and manage the cardiac involvements in asymptomatic patients with rheumatic disease.

References:1) Kobayashi Y, et al. Arthritis Research and Therapy 2010;12(5):R171, 2) Kobayashi H, et al. J. Rheumatology 2009, 36(1):106-112, **3)** Kobayashi H, et al. Mod Rheumatol 2010, 20(3):319-23