

# MYOCARDIAL T2 MAPPING FOR IMPROVED DETECTION OF INFLAMMATORY MYOCARDIAL INVOLVEMENT IN ACUTE AND CHRONIC MYOCARDITIS

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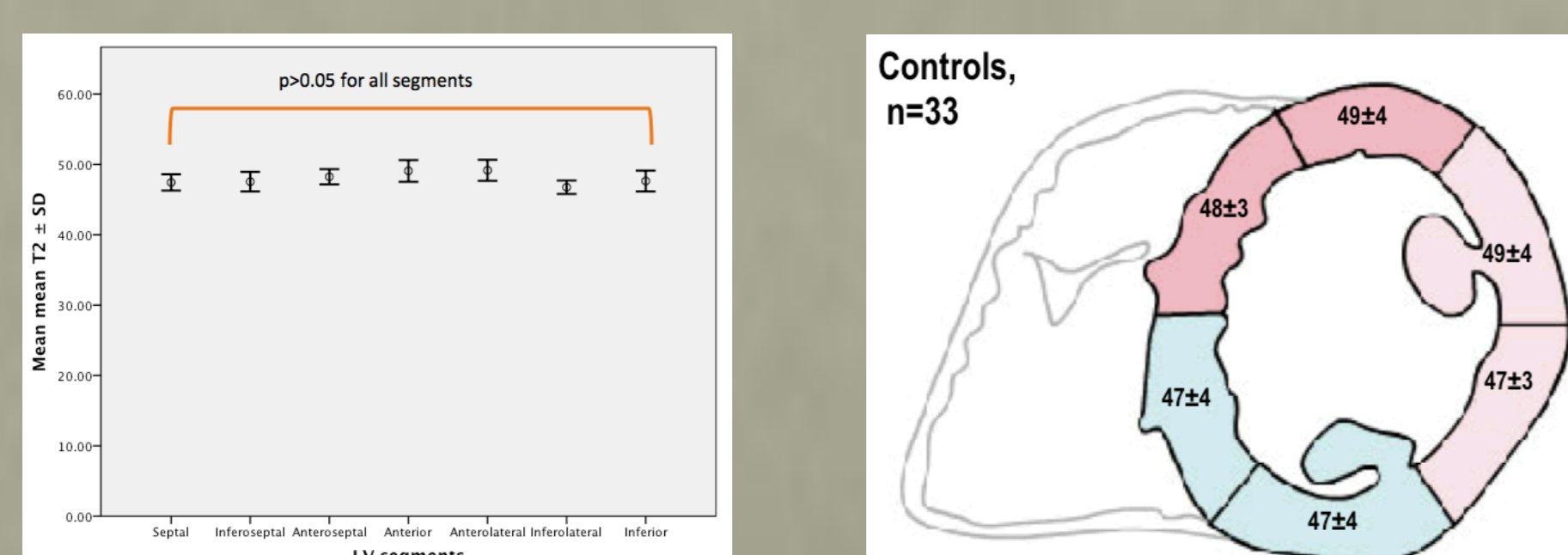
## BACKGROUND AND OBJECTIVES:

Cardiac magnetic resonance (CMR) increasingly adds to clinical confirmation of the diagnosis in patients with suspected myocarditis. The proposed Lake Louise Consensus Criteria ("any-two" approach) can separate from chronic forms of myocardial inflammation. However, both global enhancement ratio (GRE) and T2-weighted imaging are underutilized, due to poor reproducibility and high susceptibility to artifacts.

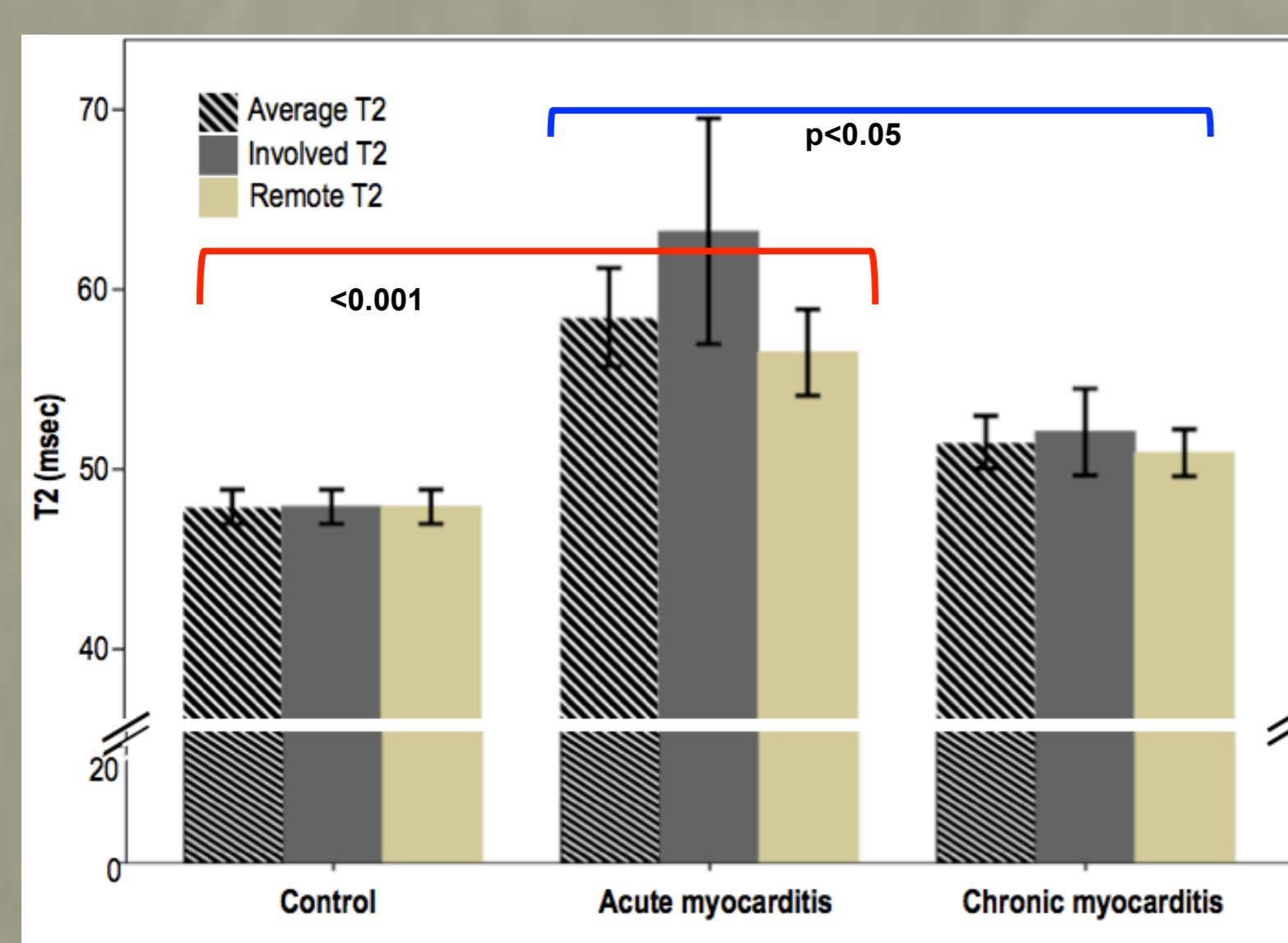
**METHODS:** Patients with acute presentation of viral myocarditis (n=24) and subjects in clinical convalescence (n=23) were recruited. Thirty-three healthy subjects were served as controls. All subjects underwent CMR study for routine assessment of myocardial oedema, function and scar by at 3-Tesla scanner. T2 values were acquired in midventricular short-axis slice (mSAX) using GraSE sequence.

## RESULTS:

- Regional T2 values did not show significant differences.



- Patients with acute myocarditis and chronic myocarditis showed significantly raised T2 values compared to controls.



*T2 values were significantly higher in acute than in chronic myocarditis*

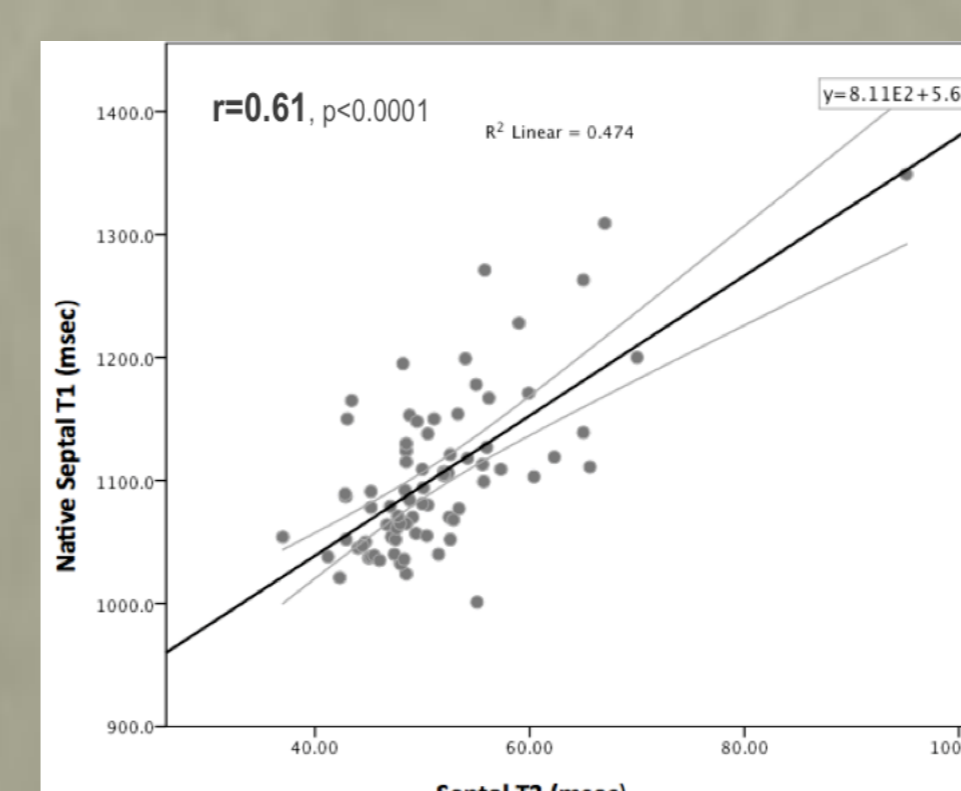
T1 and T2 mapping by CMR projects tissue-dependent relaxation times. T2 mapping has been recently proposed as a robust and accurate technique to identify areas of focal myocardial edema. Our aim was to investigate the value of quantitative T2 values in discrimination between health and disease, and separation between active/acute myocarditis and chronic convalescent stage of the disease.

We examined regional T2 values in patients and controls. T2 values are presented as an average of the six segments per mSAX. Secondly we investigated the differences between visually involved and remote myocardium (involved myocardium= areas by LGE, remote= areas with no LGE)



GraSE sequence

- T2 values were concordant with T2 edema ratio (T2 involved,  $r=0.42$ ,  $p<0.001$ ) and with native T1 ( $r=0.55$ ,  $p<0.001$ ).



*Regional T1 values were also concordant with regional T2 values*

- Inter and intra-observer reproducibility of T2 values quantification was excellent (intra:  $r=0.978$ ;  $P<0.001$ ; mean difference (MD) $\pm$ SD= $-0.05\pm 1.85$ ; inter:  $r=0.948$ ,  $P<0.001$ ; MD  $\pm$ SD= $0.01\pm 2.5$ )
- T2 values of complete mSAX or involved areas were identified as the independent discriminators between active and chronic myocarditis

**CONCLUSION:** We demonstrate that quantitative T2 values are increased in patients with myocarditis. We further demonstrate that average mSAX and involved T2 values can discriminate between acute and chronic stage of the disease.

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