

Poster presentation

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## Intra- and Interobserver Variability of different CMR-ratios for the detection of myocardial inflammation in patients with suspected acute viral myocarditis

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### Introduction

Myocarditis is a diagnostic challenge in clinical cardiology with endomyocardial biopsy (EMB) being the gold standard. Cardiac magnetic resonance imaging (CMR) has the potential to serve as a non-invasive diagnostic tool in patients with suspected myocarditis. Recently, it was reported that a combination of CMR sequences had the best diagnostic accuracy in patients suspected of having acute inflammation. However, the used sequences and established signal intensity ratios do not always provide robust and reliable results.

### Purpose

To evaluate the Intra- and Interobserver Variability of the different CMR-approaches assessing cardiac inflammation (i.e. Edema Ratio [ER] and myocardial global Relative Enhancement [gRE]).

### Methods

52 consecutive patients with suspected acute myocarditis (symptoms onset 100 examinations) and observer B (un-experienced: < 50 examinations). Linear regression analysis and Bland-Altman plots were performed to assess Intra- and Interobserver Variabilities.

### Results

The images of all patients were assessable and of good quality. The experienced observer A demonstrated a good correlation between his two measurements for the calcu-

lation of ER ( $r = 0.96$ , CI95  $r = 0.93-0.98$ ,  $P < 0.0001$  - Fig. 1) and also for the calculation of the gRE ( $r = 0.93$ , CI95  $r = 0.89-0.96$ ). The un-experienced observer B demonstrated with a significant higher Intraobserver Variability for the calculation of the ER ( $r = 0.85$ , CI95  $r = 0.75-0.91$ ) and even higher for the calculation of the gRE ( $r = 0.60$ , CI95  $r = 0.38-0.73$  - Fig. 2). Therefore, also the Interobserver Variability was higher for gRE calculations ( $r = 0.6$ , CI95  $r = 0.36-0.73$ ,  $P < 0.0001$ ) as compared to the ER calculations ( $r = 0.86$ , CI95  $r = 0.76 - 0.91$ ).

### Conclusion

The Intraobserver and Interobserver Variability of the recently described signal intensity ratios ER and gRE to assess myocardial inflammation in patients with suspected myocarditis depends very much on the experience of the observer. Therefore, the calculation of the different ratios had to be performed with reasonable care by well trained personnel to achieve a reasonable accuracy. The calculation of the gRE seems to be more critical in this regard than the calculation of the ER.