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**Title:** Reduced oxygen uptake efficiency slope in patients with cardiac sarcoidosis

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**Body:** Background: The non-invasive diagnosis of cardiac sarcoidosis (CS) is difficult. Cardiovascular magnetic resonance (CMR) has become a very valuable diagnostic tool in patients with suspected CS, but usually a combination of different tests is used. Oxygen uptake efficiency slope (OUES) is a parameter of cardiopulmonary exercise testing (CPET), which is used as an indicator for cardiovascular impairment. We investigated the predictive value of OUES for the diagnosis of myocardial involvement in sarcoid patients. Methods: Retrospectively 37 consecutive patients ( $44.9 \pm 13.8$  years) with histologically confirmed sarcoidosis and clinical suspicion of heart involvement underwent noninvasive diagnostic testing including CMR. CS was diagnosed according to the guidelines from the Japanese Society of Sarcoidosis and other Granulomatous Disorders with additional consideration of CMR findings. Furthermore, CPET with calculation of predicted OUES according to equations by Hollenberg et al. was carried out. Results: Patients with CS (11/37; 30%) had a worse cardiovascular response to exercise. OUES was significantly lower in CS-group compared to non-CS-group ( $59.3 \pm 19.1$  vs  $88.0 \pm 15.4$  %pred.,  $p < 0.0001$ ). ROC curve method identified 70 %pred. as the OUES cut-off point, which maximized sensitivity and specificity for detection of CS (96% sensitivity, 82% specificity, 89% overall accuracy).  $OUES < 70$  %pred. was the single best predictor of CS (OR: 67, 95% CI: 6.05 to 734.27,  $p < 0.001$ ) even in multivariate analyses. Conclusion: Cardiac involvement of sarcoidosis can be predicted by CPET using OUES. Patient selection for CMR can probably be guided by CPET findings in patients with sarcoidosis.