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Title: Whole-body magnetic resonance imaging in sarcoidosis to assess extrapulmonary organ involvement

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Body: Introduction: Sarcoidosis is a systemic inflammatory disorder that may affect any organ of the body. There is no valid tool to assess the extent of extrapulmonary organ involvement. Whole-body magnetic resonance imaging (MRI) might be a promising modality to detect extrapulmonary disease activity. Aim: To assess the validity of whole-body MRI with regard to extrapulmonary disease activity in patients with sarcoidosis. Methods: 24 consecutive patients at the Clinic of Respiratory Medicine, University Hospital Basel, Switzerland, with histologically-confirmed sarcoidosis were prospectively included. All patients underwent whole-body MRI. Pulmonary function tests and the extrapulmonary physician organ severity tool (ePOST) were assessed for each patient. Results: In total 9/24 (38%) patients showed findings of probable or possible sarcoidal origin. 5/24 (21%) showed skeletal lesions, 3/24 (13%) had muscular findings and 1/24 (4%) had enhancement of the cauda equina. ePOST score was significantly higher in those 9 patients with abnormal whole-body MRI-findings (17.3) than in those with normal images (10.6). FVC percentage predicted (%P), TLC,%P, and DLCO,%P were significantly lower in those patients with abnormal skeletal enhancement compared to those without skeletal abnormalities. Conclusions: Whole-body MRI depicted manifestations of extrapulmonary sarcoidosis in 38% of cases in an unselected patient sample. Abnormal whole-body MRI findings correlated with high ePOST scores, and might thus be a valid tool to assess extrapulmonary disease activity. Abnormal skeletal findings correlated with decreased lung volumes, and might therefore be a marker of total disease activity.