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MAGNETIC RESONANCE IMAGING IN THE DIAGNOSIS OF AXIAL SPONDYLOARTHRITIS: A SYSTEMATIC LITERATURE REVIEW

T. J. Bray^{*1}, A. Jones¹, P. Mandl², H. Marzo-Ortega³, M. A. Hall-Craggs¹, P. M. Machado¹ on behalf of British Society of Spondyloarthritis (BRITSpA)

¹UCL, London, United Kingdom, ²Rheumatology, Medical University of Vienna, Vienna, Austria, ³NIHR LBRC, Leeds Teaching Hospitals Trust and LRMM, University of Leeds, Leeds, United Kingdom

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Background:

Magnetic resonance imaging (MRI) is an essential tool in the diagnosis and management of axial spondyloarthritis (axSpA). However, a recent survey showed variable practices in the use of MRI across the UK [1]. To inform a joint rheumatology and radiology consensus exercise aimed at standardising practice, we systematically reviewed the literature regarding the use of MRI in the diagnosis of axSpA.

Objectives: We aimed to answer three research questions:

1. How does the choice of anatomical region influence diagnostic performance?
2. How do MRI acquisition parameters influence diagnostic performance?
3. Which lesion, or combination of lesions, is most sensitive and specific for the diagnosis of axSpA?

Methods: MEDLINE (via Pubmed) and EMBASE (via Ovid) databases were searched using previously-reported terms [2]. These terms identified studies including adult patients with clinically suspected axSpA undergoing MRI, where a diagnosis of axSpA was used as an outcome and where patients with a negative test for SpA were used as controls. We included studies performed between January 2013 and March 2017, in addition to those included in a previous systematic literature review, which included all studies up to January 2013 [2]. Search results were screened by title and abstract, and the included studies were subject to detailed review and quality assessment using the QUADAS-2 tool [3].

Results: The combined search resulted in a total of 8114 studies; 34 of these were finally selected for inclusion.

Five studies evaluated the added value of spinal MRI over SIJ MRI alone, with variable results depending on the cohort.

Three studies addressed the effect of sequence choice on diagnostic accuracy, demonstrating comparable utility of fat-saturated T2-weighted (T2w) sequences and STIR imaging, and suggesting T2w Dixon imaging as a potential alternative method for fat suppression. Three studies investigated the role of gadolinium in the SIJs, and overall found minimal added value.

Bone marrow oedema of the sacroiliac joint (SIJ) was found to be the most sensitive and specific lesion in the diagnosis of axSpA in seven studies. Sensitivity and specificity were increased by including other structural lesions, particularly bone marrow fat or erosions. Four studies addressed the utility of SIJ fat infiltration, demonstrating good sensitivity but relatively poor specificity. A number of studies addressing erosions, high T1 signal in the SIJ, fluid signal in the SIJ, ankylosis, sclerosis, capsulitis, backfill and vacuum phenomenon reported low to moderate diagnostic performance for these features. In the spine, four studies reported moderate sensitivity and specificity for corner inflammatory lesions, and four reported poor sensitivity and specificity for spinal fatty lesions.

Three studies evaluated agreement between observers for inflammatory and structural features. Agreement was best for the presence of oedema in the SIJs, but was poor for structural features. Agreement was weak to moderate for global diagnosis.

Conclusions: These results have informed the recommendations of a consensus group aiming to standardise practice around the use of MRI scans in the UK.

References: [1] Bennett et al. J Rheumatol 2017 [2] Mandl et al. Ann Rheum Dis 2015 [3] Whiting et al. Annals Int Medicine 2011

Disclosure of Interest: None declared