Introduction

Atlas of Magnetic Resonance Imaging Abnormalities in the Spine in Spondyloarthritis: Definitions, Reliability, Training, and Conceptual Framework. A Report from the Canada (SPARCC) – Denmark International Spondyloarthritis Working Group

Substantial advances in the diagnostic evaluation of spondyloarthritis (SpA) and the assessment of disease activity are due to introduction of magnetic resonance imaging (MRI). Nevertheless, this still constitutes a relatively new imaging modality in the hands of rheumatologists, while most radiologists lack experience in assessment of MRI abnormalities specific to SpA. Perhaps more importantly, there has been little interface between the subspecialties to ensure the use of a common language to avoid misinterpretation and confusion. A standard theme throughout the imaging literature pertaining to rheumatic disease is the lack of standardized definitions to describe abnormalities, and nowhere is this more apparent than in the literature pertaining to MRI. This constitutes a serious impediment to studies of diagnostic utility, assessment of disease activity, and evaluation of prognosis. With regard to the assessment of disease activity, several scoring methods for the evaluation of active inflammatory ("acute") lesions in the spine and sacroiliac joints (SIJ) of patients with SpA have been described in various degrees of detail. Nevertheless, there is limited expertise in the assessment of structural lesions on MRI in SpA and even less in the application of scoring methods. Several needs assessment surveys among Canadian rheumatologists have assigned a high priority to the need for continuing medical education in the MRI assessment of patients with SpA. Finally, there is an underlying research imperative to develop improved methods for the assessment of structural lesions, and specifically new bone proliferation in patients with SpA, to facilitate the evaluation of disease modifying therapies. Conventional radiography has proven to be insensitive to change, while preliminary studies addressing the potential value of MRI have not shown improvement over radiography in the reliability of detection of new bone formation in SpA.

The Canada–Denmark MRI Working Group was established 2 years ago with the primary objective being to develop a systematic approach to the identification, designation, and interpretation of MRI abnormalities in patients with SpA. The group includes a musculoskeletal radiologist with a special interest in SpA (R.G. Lambert), 2 academic rheumatologists with a special interest in MRI (W.P. Maksymowych and M. Østergaard), and 2 clinical rheumatology fellows (S.J. Pedersen and P. Chiowchanwisawakit). A predominant theme throughout the development of this initiative has been the creation of educational tools that will assist both rheumatologists and radiologists in their understanding of this subject. The second major theme has been the creation of consensus on systematic approaches to the assessment of MR images for both the SIJ and spine from the perspective not only of diagnostic ascertainment but also to the quantification of both active inflammatory and structural abnormalities. Our work has proceeded in stages that are outlined in this supplement.

First, we have developed comprehensive and standardized definitions of the active inflammatory and structural abnormalities observed on MRI in the spine of patients with SpA. Second, we have selected a set of reference images that aim to depict each category of active inflammatory and structural lesion and show examples of lesions that might be considered at the threshold of detection as well as those lesions that do not meet this threshold. Setting the threshold of detection constitutes a major challenge in the field because of the inherently semiquantitative and subjective approach to the assessment of the MR signal. We also show examples of MRI artefacts that may be confused with lesions observed in SpA. Third, our group has undertaken validation exercises to ensure standardized application of these definitions and thus ensure that these lesions can be reliably detected. Fourth, we have developed Web based learning modules with the following objectives: to present a standardized and systematic approach to the MRI evaluation of the spine and SIJ, to facilitate quantitative assessment of spinal and SIJ inflammation using the scoring methods

developed by the Spondyloarthritis Research Consortium of Canada (SPARCC), and to highlight potential pitfalls in the use of scoring methods for the evaluation of inflammatory lesions.

We consider all these steps an essential prerequisite to further investigation of the potential of this imaging modality in SpA and an essential tool for training rheumatologists and radiologists in the interpretation of MRI abnormalities in SpA.

WALTER P. MAKSYMOWYCH, MD, FRCPC,
Department of Medicine,
University of Alberta,
Edmonton, Canada;
MIKKEL ØSTERGAARD, MD, PhD, DMSc,
Department of Rheumatology,
Copenhagen University Hospitals at Hvidovre and Glostrup,
Copenhagen, Denmark;
PRAVEENA CHIOWCHANWISAWAKIT, MD,
Department of Medicine,
University of Alberta, and
Faculty of Medicine,
Mahidol University,
Bangkok, Thailand;
SUSANNE J. PEDERSEN, MD,
Department of Rheumatology,
Copenhagen University Hospitals at Hvidovre and Gentofte;
ROBERT G.W. LAMBERT, MB, FRCR, FRCPC,
Department of Radiology and Diagnostic Imaging,
University of Alberta

We are grateful for the support provided through the National Research Initiative from The Arthritis Society.

J Rheumatol 2009;36:1-2; doi:10.3899/jrheum.090615