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THREE-MONTH RADIOLGICAL CHANGES IN WRIST JOINT MEASURED BY MRI AND HR-PQCT CAN PREDICT 12-MONTH CHANGES IN EROSION AND FUNCTIONAL OUTCOMES AFTER MTX AND ANTI-TNF TREATMENT IN PATIENTS WITH RHEUMATOID ARTHRITIS: A MULTI-MODALITY IMAGING STUDY

Keni Mamoto1,2, Tomohiro Shimizu3, Matthew Tanaka4, Valentina Pedoia5, Andrew Burghardt4, Ursula Helmeier5, Thomas Link6, Jonathan Graf6, John Imboden5, Li Xiaojuan1.

1Yodogawa Christian Hospital, Orthopaedic Surgery, Osaka, Japan; 2University of California San Francisco, Radiology and Biomedical Imaging, San Francisco, United States of America; 3Hokkaido University Medical School, Orthopaedic Surgery, Sapporo, Japan; 4University of California San Francisco, Radiology and Biomedical Imaging, Musculoskeletal Quantitative Imaging Research, San Francisco, United States of America; 5University of California San Francisco, Medicine, Division of Rheumatology, San Francisco, United States of America

Background: Magnetic resonance imaging (MRI) provides noninvasive methods to quantify joint inflammation and early cartilage degeneration in monitoring rheumatoid arthritis (RA) progression1. High-resolution peripheral computed tomography (HR-pQCT) provides reliable evaluation of bone erosion volumes2.

Objectives: To investigate if changes in MR measures from baseline to 3-month (3M) can predict changes in erosion volumes, clinical and functional assessment from baseline to 12-month (12M) in RA patients receiving methotrexate (MTX) and anti-tumor necrosis factor alpha (Anti-TNF) therapy using MRI and HR-pQCT.

Methods: Seventeen RA patients with MTX treatment were recruited into an observational study from May 2017 to May 2018. All patients were classified into low disease activity (DAS) group (n=9, DAS28 ≤3.2) or high DAS group (n=8, DAS28>3.2). The low DAS group received MTX treatment to MTX immediately after baseline visit (BL). Volumes of synovitis (SYN), bone erosion volumes in wrist joint by HR-pQCT and bone marrow edema (BMEL) were measured by MRI. Serum C-reactive protein (CRP) and high-sensitivity C-reactive protein (hsCRP) levels were measured at every visit.

Results: Anti-TNFx therapy in the high DAS group resulted in significant decreases of SYN, BMEL at 3M and 12M and Anti-CarP at 12M, implying erosion repair. In this study, changes in erosion (but not other MR measures including synovitis and bone marrow edema) within the first 3M predicted changes in erosion at 12M. On the other hand, changes in synovitis volumes predicted patient functional outcomes at 12M. These results suggest that modularity quantitative imaging with MRI and HR-pQCT provides powerful tools for evaluating early changes and predicting disease progression and therapy response after treatment in RA. Large scale studies with larger sample size are warranted to confirm the observations.

REFERENCES:

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