

erosions. Functional outcomes have an irreversible component that is strongly related to the amount of structural damage. This needs to be considered when targeting functional outcomes in clinical practice.

References:

- [1] Kavanaugh A, van der Heijde D, McInnes IB, et al. Golimumab in psoriatic arthritis: one-year clinical efficacy, radiographic, and safety results from a phase III, randomized, placebo-controlled trial. *Arthritis Rheum* 2012; 64: 2504–2517.

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THU0702 ARE MRI-DETECTED EROSIONS SPECIFIC FOR RA? A LARGE EXPLORATIVE CROSS-SECTIONAL STUDY

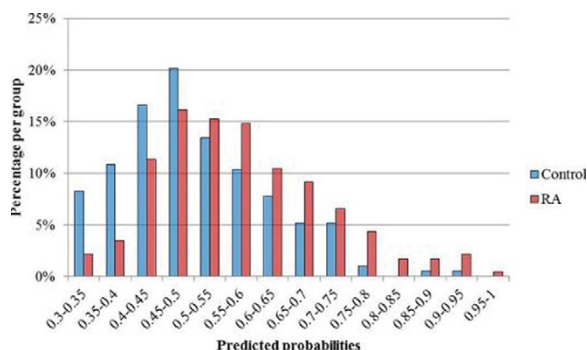
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Background: Magnetic resonance imaging (MRI) is recommended in the diagnostic process of rheumatoid arthritis (RA), as it can detect damage at an earlier time point than conventional radiographs. However, MRI-detected erosions as defined by EULAR and included in RAMRIS are also observed in symptom-free controls, especially at older age. It is unclear how RA-specific erosions on MRI can be distinguished from physiological erosions in symptom-free individuals. Therefore this study compared MRI-detected erosions between RA-patients and healthy controls, including evaluation of the effect of age.

Objectives: To compare characteristics of MRI-detected erosions (total erosion score, location and severity of erosions and simultaneous presence of MRI-detected inflammation) in metacarpophalangeal (MCP) and metatarsophalangeal (MTP) joints between RA-patients and healthy controls.

Methods: 422 subjects (229 newly presenting patients with a clinical diagnosis of RA and fulfilling the 2010-criteria and 193 symptom-free controls) underwent contrast enhanced 1.5T MRI of unilateral MCP and MTP joints. The readers were blind to the clinical information. Total erosion score according to the RAMRIS method (hence a combination of number and severity), location and severity of erosions and simultaneous presence of MRI-detected inflammation (synovitis and/or bone marrow edema) were compared between groups, also in relation to age.

Results: First total erosion scores were analyzed. Both in RA-patients and in controls this score was associated with age ($p < 0.001$ in both groups). In addition, at all ages and on group level, RA-patients had 1.2 (95% CI 1.1–1.3) times higher erosion scores than controls. Despite this difference, total erosion scores could not differentiate RA-patients from controls on the individual level, as there was large overlap (Figure). Next different characteristics of erosions were explored within age groups (<40, 40–59, ≥60) to search for RA-specific features. With respect to location, erosions found in MTP5 were specific for RA (spec 90–98% for different age groups). Erosions found in MTP1 were specific for RA if subjects were aged <40 (spec 98%), but specificity decreased by increasing age (spec 86% if aged 40–59 and 63% if aged ≥60). Evaluating the severity revealed that “severe erosions” (scores ≥2) were infrequent in all subjects, but almost exclusively present in RA (spec 98–100%). Finally the simultaneous presence of erosions with inflammation was studied. In the age group <40 years, the simultaneous presence was exclusively observed in RA-patients (specificity 100%); but specificity decreased by age since the combined presence was also seen in symptom-free controls (spec 91% if aged 40–59 and 71% if aged ≥60 years).



Conclusions: Whilst the group of RA-patients at disease presentation had significantly higher erosion-scores than healthy controls, scores of individual subjects were largely overlapping. Some erosion characteristics were specific for RA, but these were present in only a minority of all RA-patients (22%).

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THU0703 SYSTEMATIC REVIEW OF RHEUMATOID ARTHRITIS CLINICAL STUDIES: SUBOPTIMAL STATISTICAL ANALYSIS OF RADIOLOGICAL DATA

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Background: Radiography is an inexpensive, reliable and reproducible method to detect and quantify progression of damage, an important outcome in rheumatoid arthritis (RA) trials and observational studies. However, the distribution of progression scores is skewed with many low or zero scores. Analysis of such data is challenging, and the choice of analysis technique may influence the result. Current analysis practice is unknown.

Objectives: We systematically searched the literature to identify current practice for the analysis of radiographic progression in clinical trials and observational studies of RA.

Methods: PubMed Embase and Cochrane databases were searched (2006–2016) to identify studies that described analysis techniques to compare radiographic progression in at least two groups. Studies in animals, children as well as conference abstracts and studies not written in English were excluded. Titles and abstracts were screened by one researcher (SM); a second investigator (LvT) evaluated the included cases, doubtful cases and a random sample of the excluded cases.

Information on study design, sample size, assessment methods and analysis technique was extracted by one researcher (SM), in consultation with 3 others (LvT; MB and JT).

Results: Of 5980 identified papers, 252 were eligible. 226 of these reports were on a single study while 26 were on multiple studies in one paper.

Of the 226 studies, 75 studies used parametric techniques, such as t-tests, ANOVA or linear regression to analyze the data. Of these only 12% took the skewed distribution into account. In 78 studies, the continuous data was categorized into two or more groups and analyzed with binomial or ordinal methods, such as chi-square tests or logistic regression analyses. 4 studies treated the outcome as a “count” outcome variable (2 studies applied a Poisson regression, 1 a negative binomial regression and 1 a zero-inflated binomial regression).

43% compared more than two groups. Median (IQR) sample size was 351 (range 163–608). 30% had one reader, 57% two readers, and 2% more than two; in 10% the number of readers was not recorded. Order of reading was random in 43%, sequential in 31%, and unknown in 26%. Most applied the Sharp van der Heijde scoring method (75%); 9% the Genant modification, and 16% other methods.

Conclusions: There is large heterogeneity in the analysis strategy of radiographic progression in recent RA clinical trials and observational studies: a large number of studies apply simple, suboptimal or inappropriate methods. In addition, key information (i.e. number of readers and order of readings) is poorly documented.

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THU0704 EVALUATION OF THE ACCURACY OF HAND AND FOOT MRI IN THE EARLY IDENTIFICATION OF RA: USING THE PREVALENCE OF LOW-GRADED INFLAMMATION IN THE SYMPTOM-FREE POPULATION AS REFERENCE REDUCES FALSE-POSITIVE MRI RESULTS

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Background: Early identification of rheumatoid arthritis (RA) is important, because it allows early treatment initiation and is associated with better disease outcomes. In this perspective, the use of hand and foot MRI in the diagnostic process of rheumatoid arthritis (RA) has been advocated. Recent studies showed that MRI is helpful in predicting progression from clinically suspect arthralgia (CSA) to clinical arthritis, and from undifferentiated arthritis (UA) to RA. However, the diagnostic value of MRI is still undetermined. Most studies focussed on the sensitivity rather than the specificity of inflammation detected on MRI. It is known that symptom-free persons can also show inflammation on MRI. Consequently, it has been questioned if MRI-findings in symptom-free volunteers are relevant to consider as a reference when defining a “positive MRI”.

Objectives: To determine the value of considering MRI-findings in a control group for the predictive accuracy of MRI when defining a positive MRI.

Methods: 225 patients with CSA and 201 patients with UA underwent MRI of MCP-, wrist- and MTP-joints at baseline and were followed for 1 year on progression to arthritis and RA respectively. MRI was considered positive either if ≥1 joint showed inflammation (called “uncorrected definition”), or if ≥1 joint had inflammation that was present in <5% of persons of the same age-category at the same location in a symptom free reference population (called “5% corrected definition”). MRI scans were scored according to RAMRIS method. Test characteristics were compared for both definitions, hence with and without the incorporation of a reference population when defining a “positive MRI”.

Results: By using MRI-data of symptom-free volunteers as reference, the