Ann Rheum Dis 2015;**74**:880 doi:10.1136/annrheumdis-2015-eular.1886

Poster Presentations

SAT0603 Evaluating Impact of Risk Associated Outcomes on Ultrasound Doppler Score of Patients with Inflammatory Hand Joint Pain Using a Beta-Binomial Model

1. **C. Ciurtin**[1],
2. **K. Wyszynski**[2],
3. **J. Manson**[1],
4. **G. Marra**[2]

Abstract

Background Ultrasound (US) assessment of small joints is essential for the diagnosis of polyarticular inflammatory arthritis (IA) and guidance of the therapeutic decisions in patients with established rheumatoid arthritis (RA). The access to US varies among hospitals and rheumatology services. Even if a considerable proportion of patients with hand joint pain or established RA might have subclinical inflammation, it is not cost-effective to screen them all.

Objectives The objective of our study was to build a statistical model to assess the influence of several outcome measures (such as number of tender joints (TJC) and swollen joints (SJC) out of 28, GVAS, CRP, ESR, presence of RF and anti CCP antibodies, disease duration and medication) on the presence of Power Doppler (PD) signal at the US examination of hand joints.

Methods We proposed a regression model to assess the contribution of every outcome measure to the risk of having active joint inflammation as well as predict PD signal. We excluded patients with PD signal present in more than 10/22 joints to ensure homogeneity in the data. We conducted a real life study including 276 patients referred for the suspicion of active joint inflammation (new referrals for the suspicion of IA, RA patients and patients with other inflammatory rheumatic conditions). We assessed 22 hand joints in every patient, irrespective of their hand symptoms, using the Omeract scoring system for PD signal. All patients had clinical assessments and lab tests within 2 weeks from the US scan. The proposed regression model was based on a beta-binomial distribution (1 = disease present, 0 = disease absent) for the PD score variable and a mix of main interaction effects for the outcome measures stated above. Negative interaction effects showed that the respective outcome was associated with a lower number of joints with PD signal.

Results The marginal effects of different variables on the number of joints with PD signal at the US examination in newly referred patients for the suspicion of IA, previous diagnosis of RA, and patients with other inflammatory conditions were examined. Our statistical model suggested that patients with RA diagnosis treated with Tocilizumab tend to have a lower PD score than patients treated with other biologics or DMARDs, despite similar clinical and laboratory findings. The presence of RF increased the PD score only in patients with clinical suspicion of IA. CRP and ESR had almost no effect on predicting PD. Out of all three clinical outcomes, TJC, SJC and GVAS, only the SJC correlated with an increased PD score and only in patients with RA.

Effects of a selection of outcomes on the PD score (magnitude of effect and CI).			
RA status	0	0	1
Clinical suspicion of IA with no previously established diagnosis of a rheumatic condition	0	1	0
RF	2.76 (2.32, 3.21)	0.11 (-0.25, 0.46)	-0.09 (-0.23, 0.06)
CCP	-0.75 (-1.07, -0.42)	0.01061559 (-0.35, 0.37)	0.65 (0.50, 0.80)
Methotrexate	N/A	N/A	0.01 (-0.12, 0.13)
Adalimumab	N/A	N/A	0.79 (0.58, 1.01)
Etanercept	N/A	N/A	0.01 (-0.12, 0.13)
Rituximab	N/A	N/A	0.62 (0.45, 0.79)
Tocilizumab	N/A	N/A	-1.81 (-1.90, -1.72)
CRP	0.0278 (0.0277, 0.0279)	0.004856 (0.004850, 0.004862)	0.0546 (0.0544, 0.0547)
ESR	0.01551 (0.01548, 0.01555)	0.01880 (0.01871, 0.01889)	0.007728 (0.007725, 0.007731)
TJC	-0.00915 (-0.00917, -0.00914)	0.02020 (0.02010, 0.02030)	-0.0018359 (-0.0018360, -0.0018357)
SJC	0.100 (0.099, 0.102)	0.086 (0.0841, 0.0879)	0.214 (0.212, 0.216)
GVAS	0.004594 (0.004590, 0.004597)	-0.01021 (-0.01024, -0.01019)	-0.005323 (-0.005324, -0.005321)

View larger version:

In a new window

Download as PowerPoint Slide

Conclusions This prediction model has potential to be useful in identifying what patients will benefit from having an US scan and improve our referral criteria to the US clinics, aiming also to minimise the risk of underdiagnosing active IA.