Ultrasonic Evaluation of Joint Involvement in Established RA: Active Synovitis Predicts Switching in Suspected Biologic Failure

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Background

- 2012 ACR Guidelines recommend biologic switching if there is evidence of high/moderate disease activity[1].
- High disease activity is defined as DAS28 of >5.1.
- US is recognised as a powerful tool to detect inflammatory changes when compared to clinical examination, and is effective for assessing response to treatment[2].

Aims

We aim to establish the role of US in biologic switching when compared to clinical assessment with DAS28 and HAQ in patients with Rheumatoid Arthritis.

We aim to show that confirmation of ultrasound synovitis in patients with biologic failure, influences consultant decision to switch to a different drug.

Methods

- Twenty patients with suspected biologic failure referred for Musculoskeletal US from two secondary care centers in the North East of England.
- Standardised inclusion (on biologics min 6 months) and exclusion criteria (NSAIDS within 48 hours, Steroids within 2 weeks)
- PRF 0.6-0.8 for all images
- US of the Backhaus 7 joint count was performed on the most affected side.
- OMERACT semi-quantitive scoring was used to assess grey scale, power doppler and tenosynovitis.
- A total ultrasound score (TUSS) was derived from the sum of these scores.
- DAS28 and HAQ were obtained prior to biologic treatment and at the time of US.
- Physician decision to continue or switch biologic was documented pre- and post-US.

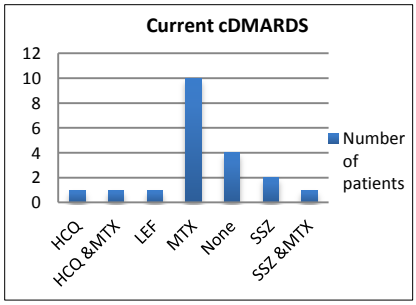
Results

- Male: Female ratio was 1:3 (consistent with UK national demographics for incidence of RA)
- Age range was 30-69 (mean 56.9).
- 95% of patients were seropositive.
- 80% were taking at least 1 conventional DMARD in addition to a biologic.
- IQR for length of treatment on current biologic was 9.5 months to 4 years 2 months.
- Pre-Biologic DAS range 4.40 -8.24, Mean 6.23, IQR 5.77 – 6.70.

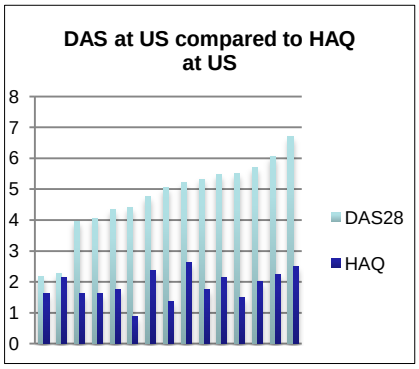
DAS28 at US		Total Ultrasound Score (TUSS)		Clinician Impression pre-US		Clinician Impression post US	
High Activity (>5.1)	11 (55%)	High Activity (>12)	5 (25%)	High Activity	4 (20%)	High Activity	5 (25%)
Moderate Activity (3.2-5.1)	6 (30%)	Moderate Activity (10-12)	4 (20%)	Moderate Activity	10 (50%)	Moderate Activity	4 (20%)
Low Activity (<3.2)	3 (15%)	Low Activity (<10)	11 (55%)	Low Activity	6 (30%)	Low Activity	11 (55%)

Table 1. Disease Activity measured by DAS28 and Ultrasound, and Clinical Outcomes

- Pre-Biologic HAQ range 1.375-2.875, mean 1.984, IQR = 1.500-2.310.

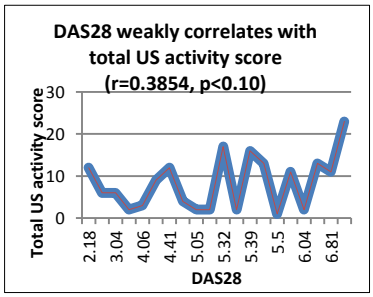


- No significant correlation between pre-biologic DAS and HAQ (r=0.3783).
- No significant correlation between DAS28 and HAQ at the time of US (r=0.3178).



- No significant correlation between HAQ and TUSS (r=-0.673, p<0.01).
- HAQ positively correlated with VAS (r=0.5436, p<0.05), however neither of these measures correlated with inflammatory markers or US scores.

14/20 (70%) cases altered clinician opinion on treatment following US



Conclusions

- Overestimation of disease activity by DAS28 is most likely influenced by subjective measures.
- Using DAS28 alone may result in misclassification of disease activity and over-treatment with subsequent high morbidity and financial costs.
- Treatment escalation was more likely when US demonstrated synovitis, and less likely when US negative.
- We plan to modify our biologic treatment pathway with the addition of MSK US assessment in order to ensure the provision of targeted therapy for those with suspected biologic failure.
- Current lack of evidence for treating to US target has long term benefit over treating to DAS28 target. More research needed.

Acknowledgements

1. Smolen JS et al. Treating rheumatoid arthritis to target: recommendations of an international task force. Ann Rheum Dis 2010;69:631–7. doi:10.1136/ard.2009.123919
2. MA D'Agostino et al. Novel Algorithms for the pragmatic use of ultrasound in the management of patients with rheumatoid arthritis: from diagnosis to remission. Ann Rheum Dis 2016;0;1-7, doid10.1136/annrheumdis-2016-209646

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