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IMAGING REMISSION BY MUSCULOSKELETAL ULTRASOUND LEADS TO A BETTER FUNCTIONAL OUTCOME – RESULTS OF THE US IMPERA STUDY - US 7-SCORE IMPLEMENTATION STUDY IN EARLY RHEUMATOID ARTHRITIS

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Background: Novel treatment options together with a treat-to-target strategy present new challenges to imaging procedures in terms of therapy monitoring.

Objectives: To evaluate the functional outcome measured by Health Assessment Questionnaire (HAQ) as the primary outcome in patients with early rheumatoid arthritis (RA) who were treated by standard clinical care (clinical cohort) in comparison to patients in whom treatment decisions were additionally based on musculoskeletal ultrasound (US) using the US7 score (US-cohort) in a nationwide investigator initiated study in Germany.

Methods: Functional (HAQ), clinical (DAS28, patient's Visual Analogue Scale [VAS] for disease activity) and laboratory parameters (erythrocyte sedimentation rate [ESR], C-reactive protein [CRP]) were analyzed at seven different time points for a total of 18 months and compared between the two study cohorts. Treatment decision was made according to local standard of care (SOC) with a treatment goal of DAS28 < 3.2. In the US-cohort, imaging remission criteria were defined as Gray-scale US (GSUS) < 2 and Power Doppler-US (PDUS) = 0 per joint level. In a subgroup analysis, US patients were analyzed separately with regard to imaging remission status and the parameters outlined above.

Results: Data of 313 patients (US-cohort [n=166], clinical cohort [n=147]) demonstrated a reduction of HAQ, DAS28, VAS and laboratory activity (ESR, CRP) to a low disease activity status 18 months after the beginning/change of antirheumatic therapy according to SOC (table 1). The results of functional and clinical outcome in both cohorts did not show significant differences. However, subgroup analysis of the US-cohort with imaging remission resulted in a significantly lower HAQ, DAS28 and VAS compared to patients not fulfilling these US remission criteria (table 1).

Image/graph:

		HAQ	DAS28	ESR (mm/h)	CRP (mg/l)	Patient's VAS (mm)
Baseline						
Total population (n=313)	**Clinical cohort (n=147)**	1.020	5.1	33.1	23.0	56.9
	US-cohort in total (n=166)	1.050	5.2	29.3	17.2	57.3
		p=0.600	p=0.596	p=0.194	p=0.073	p=0.998
Subgroup analysis of US-cohort (n=166)	**Non-remission group (n=87)**	1.120	5.3	32.2	20.6	57.1
	Remission group (n=79)	0.971	5.1	26.2	13.7	57.4
		p=0.208	p=0.316	p=0.182	p=0.272	p=0.945
Month 18						
Total population (n=313)	**Clinical cohort (n=147)**	0.555	2.8	18.1	6.4	26.7
	US-cohort in total (n=166)	0.579	2.8	16.6	6.4	25.6
		p=0.758	p=0.800	p=0.174	p=0.585	p=0.397
Subgroup analysis of US-cohort (n=166)	**Non-remission group (n=87)**	0.741	3.4	18.4	7.8	33.9
	Remission group (n=79)	0.401	2.2	14.6	4.6	16.6
		p=0.002*	p<0.001*	p=0.406	p=0.089	p<0.001*

*p<0.05 for significant difference

Conclusions: Treatment strategies by a treat to target approach in early RA patients reduced disease activity and improved functional outcome of HAQ irrespective of imaging guidance. However, patients with imaging remission by US exhibited a significantly better functional outcome and lower disease activity status. Accordingly, an additional ultrasound examination aiming at imaging remission should be strongly considered in clinical practice.

Disclosure of Interest: None declared