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POS0952

RESPONSIVENESS OF SPINAL MOBILITY MEASUREMENTS IN AXIAL SPONDYLOARTHRITIS USING CONVENTIONAL AND ADVANCED METROLOGY: A PILOT STUDY

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Background: Spinal mobility is an important outcome in axial spondyloarthritis (axSpA). Standardized metrology tests have been defined and validated. Nevertheless, conventional metrology measures lack responsiveness, particularly in the context of assessing short term response to treatments. Advanced metrology devices have also been used in axSpA, namely optical motion capture systems (MoCap) and Inertial Measurement Systems (IMU). These systems have better psychometric properties in terms of accuracy and reliability for analysing spinal mobility.

Objectives: To compare the responsiveness of spinal mobility using conventional and advanced metrology.

Methods: Spinal mobility was measured using an IMU based system (ViMove©) with sensors located at: occiput and T3 for cervical mobility, L1 and sacrum for lumbar mobility, and T3 and sacrum for thoracic+lumbar mobility. A MoCap system (UCOTrack©) using 13 markers was also used to record the movements in 3 planes (flexion+extension, rotation, and lateral flexion). The UCOASMI [1] index was calculated using measures obtained by MoCap and by the IMU system. Other metrology indexes based on IMU measures developed by the authors [2] were also calculated. Patients were assessed before (PRE) and 3 months after (POST) TNF blocker treatment. The Wilcoxon signed-rank test was used to test differences between pairs of pre- and post-treatment. Cohen's d was used for calculating the effect size of improvement.

Results: 12 axSpA patients were recruited from the CASTRO cohort (42% female, age 46±11 years, disease duration 16±13 years). Results PRE and POST are shown in Table 1: means (sd), statistical significance, and effect size. Disease activity and functional indexes were lower in POST and these differences were significant, especially in ASDAS. Conventional metrology lacked responsiveness, except for cervical rotation. MoCap showed moderate

responsiveness in cervical rotation, in thoracolumbar mobility and with regards to the UCOASMI. Using IMU measures, responsiveness was good in terms of cervical flexion and rotation. For Lumbar (L₁) and Lumbar Thoracic (LT₁), lateral flexion shown significant improvement and lumbar rotation shown the best responsiveness.

	PRE	POST	Sign	ES		PRE	POST	Sign	ES
<i>Activity</i>									
<i>IMU</i>									
BASDAI	6.5 (1.6)	4.9 (2.7)	*	0.64	C_FLEX	77 (22)	83 (19)	*	-0.25
BASFI	6.5 (2.3)	4.8 (3.2)	*	0.58	C_ROT	78 (25)	84 (22)	*	-0.22
ASDAS	3.6 (1.0)	2.5 (1.2)	**	0.87	C_FL	54 (19)	54 (17)	NS	
<i>Metrology</i>									
LatFlex	9.3 (4.1)	10.6 (3.3)	NS		L_FLEX	46 (16)	44 (19)	NS	
TWD	13.2 (4.2)	12.8 (3.6)	*	0.06	L_ROT	21 (9)	27 (9)	***	-0.66
Schober	4.7 (1.5)	4.9 (1.5)	NS		L_FL	32 (1)	38 (10)	*	-0.52
IMD	89 (15)	90 (15)	NS		LT_FLEX	62 (28)	63 (24)	NS	
CervRot	104 (28)	118 (24)	**	-0.51	LT_ROT	63 (19)	70 (19)	NS	
BASMI	3.8 (1.3)	3.4 (1.2)	NS		LT_FL	52 (15)	60 (15)	**	-0.51
<i>MoCap</i>									
C_FLEX	81 (22)	87 (20)	*	-0.28	Trk_FLEX	109 (28)	112 (24)	NS	
C_ROT	101 (28)	112 (25)	***	-0.38	Trk_ROT	98 (31)	116 (21)	**	-0.59
C_FL	58 (20)	58 (18)	NS		Trk_FL	39 (9)	46 (10)	**	-0.7
L_FLEX	107 (24)	114 (21)	***	-0.26	TTrk_FLEX	119 (36)	128 (30)	NS	
L_ROT	67 (21)	73 (20)	NS		TTrk_ROT	137 (34)	161 (35)	**	-0.67
L_FL	57 (18)	65 (20)	**	-0.41	iUCOASMI	5.7 (1.5)	5.0 (1.4)	***	0.48
UCOASMI	6.1 (1.6)	5.3 (1.6)	**	0.50	iUCOASMIT	6.0 (1.5)	5.4 (1.3)	**	0.39
					iCXLASMI	3.9 (1.8)	3.2 (1.5)	**	0.40
					iCLuASMI	3.2 (1.4)	2.7 (1.3)	***	0.40

NS, not significant; *, p<0.05; **, p<0.01

Conclusion: Conventional metrology lacks short-term responsiveness. Advanced metrology using MoCap and IMU showed, in this pilot study, better responsiveness compared to conventional measures. Furthermore, IMU provide a feasibility similar to conventional metrology, and could be easily implemented in the context of clinical trials and observational studies.

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POS0953

PERIPHERAL ARTHRITIS AND HIGHER DISEASE ACTIVITY LEAD TO MORE FUNCTIONAL IMPAIRMENT IN AXIAL SPONDYLOARTHRITIS: LONGITUDINAL ANALYSIS FROM ESPAXIA

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Background: Preserving functional ability is among the main goals when treating patients with axSpA. Higher disease activity, reduced axial mobility, and increase spinal radiographic damage, and smoking status have shown to be longitudinally associated with functional worsening. The presence of peripheral arthritis has also been associated with worse functional ability during follow-up, though not in a true longitudinal analysis.

Objectives: To investigate whether peripheral arthritis together with disease activity independently contribute to functional impairment over time in patients with axSpA and to evaluate if there are contextual factors modifying this relationship.

Methods: Patients with axSpA from the ESPAXIA cohort were followed-up annually over 7 years. Physical function was assessed by the self-reported questionnaire BASFI, disease activity by ASDAS and peripheral arthritis was also recorded. The association between BASFI (outcome), peripheral arthritis and ASDAS (main variables of interest) over time was tested in generalized estimating equations (GEE) models. Models were autoregressive, i.e. adjusted for BASFI 1 year earlier, to allow for a truly longitudinal interpretation. Interactions between each of ASDAS and peripheral arthritis with contextual factors were tested.

Results: 185 patients were included (77 % male, mean age 42 (SD 13), mean disease duration 9.4 (SD 9.6) years. Mean baseline ASDAS was 2.3 (1.4), mean BASFI