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# Differences in Spinal Mobility Measures in Relation to Disease Duration and Between Subgroups with Axial Spondyloarthritis

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## CONCLUSIONS

The first measures to significantly change during the disease course in AS were the lumbar and thoracic mobility measures and the BASMI score. As expected, patients with nr-axSpA were less affected in mobility than patients with AS.



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## INTRODUCTION

Spinal mobility is a core domain for research and clinical practice in Ankylosing Spondylitis (AS) but less studied in non-radiographic axial spondyloarthritis (nr-axSpA). Our objective was to study the change of commonly used spinal mobility measures stratified on disease duration in patients with AS and differences in these measures in AS vs. nr-axSpA.

## METHODS

Patients with AS or nr-axSpA were identified from a cohort attending a specialist clinic. A cross sectional study, where the first measures of spinal mobility for each patient recorded during 1999 to 2012 were analyzed. Disease duration for the AS group was split into tertiles, ( $\leq 17$  years (G1), 18-30 years (G2) and  $\geq 31$  years (G3)). Differences between AS G1/G2/G3 were calculated with Kruskal-Wallis. Differences between AS and nr-axSpA were controlled for sex and disease duration (ANCOVA).

Table 3 a. Results from the linear regression analysis showing b (parameter estimates) and 95% confidence intervals (95% CI) of spinal mobility measures (BASMI and included measures) with regard to AS or nr-axSpA controlled for gender and disease duration.

	BASMI		Cervical rotation		Tragus-wall distance		Lateral spinal flexion		Lumbar flexion		Maximal inter-mall distance	
	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=
<b>AS</b>	0.904 (0.245 - 1.562)	0.008	-11.029 (-24.122 - 2.065)	0.098	2.333 (0.532 - 4.134)	0.011	-6.171 (-9.848 - -2.495)	0.001	-0.688 (-1.218 - -0.158)	0.011	-7.177 (-14.353 - -0.001)	0.050
<b>nr-axSpA</b>	0		0		0		0		0		0	
<b>Women</b>	0.070 (-0.521 - 0.660)	0.816	4.301 (-7.599 - 16.200)	0.476	-1.621 (-3.279 - 0.038)	0.055	-1.924 (-4.309 - 2.460)	0.591	0.133 (-0.358 - 0.624)	0.594	-9.261 (-15.760 - -2.762)	0.006
<b>Men</b>	0		0		0		0		0		0	
<b>Disease-duration</b>	0.045 (0.023 - 0.068)	0.000	-0.993 (-1.428 - -0.559)	0.000	0.102 (0.042 - 0.161)	0.001	-0.256 (-0.383 - -0.128)	0.000	-0.031 (-0.049 - -0.013)	0.001	-0.487 (-0.739 - -0.236)	0.000

AS=Ankylosing Spondylitis, nr-axSpA=non radiographic axial Spondylarthritis

## RESULTS

Table 1. Patient characteristics for the AS and nr-ax SpA groups.

Variables	AS	nr-axSpA
Age, m (SD)	48,4 (13,7)	41,6 (11,4)
Male/Female, n (%)	97/29 (77/23)	31/26 (54/46)
HLA-B27, n (%)	75 (60)	41 (72)
Positive SI-joint radiology, n (%)	110 (87)	7 (12)
Disease duration, years, m (SD)	24,7 (12,9)	13 (10,6)
Diagnosis delay, years, m (SD)	7.8 (6.4)	6.4 (8.8)

AS=Ankylosing spondylitis, nr-ax SpA= non-radiographic axial Spondylarthritis, mean (m) and standard deviation (SD), ESR= erythrocyte sedimentation rate, HLA-B27= human leukocyte antigen-B27, SI= Sacroiliac.

Table 2. Descriptive statistics of the spinal mobility measures presented with median and interquartile range (IQR) for the AS group divided in tertiles stratified on disease duration G1=0-17 years, G2=18-30 years, G3= $\geq 31$  years. Differences between the groups were calculated with Kruskal-Wallis.

Spinal mobility measures	0-17 years (G1)	p-value (G1 vs. G2)	18-30 years (G2)	p-value (G2 vs. G3)	$\geq 31$ years (G3)	p-value (G1 vs. G3)
<b>BASMI</b>	2.6 (1.8-3.8)	0.006	3.8 (2.9-5.8)	1.000	4.0 (3-4.8)	0.010
<b>Cerv. flex/ext, deg</b>	107.5 (95-115)	0.152	95 (60-115)	1.000	90 (57.5-110)	0.035
<b>Cerv. lat flex, total, deg</b>	62.5 (50-80)	0.221	55 (32.5-70)	0.402	45 (15-60)	0.005
<b>Cerv. rot, total, deg</b>	132.5 (116-144)	0.097	115 (87.5-137.5)	1.000	102.5 (61.3-130)	0.009
<b>Chest expansion, cm</b>	4.5 (4-6.5)	0.035	4.0 (3-5)	0.275	3.0 (2.4-3.8)	0.000
<b>Vital capacity, liter</b>	4.9 (3.9-5.2)	0.006	3.8 (3.1-4.4)	0.132	3.3 (2.2-3.6)	0.000
<b>Thoracic flex, cm</b>	2.0 (1.5-3)	0.006	1.5 (0.5-2)	1.000	1.0 (0.5-2)	0.001
<b>Tragus-to-wall dist, cm</b>	12 (10.6-14.5)	0.555	13 (10.8-18.3)	0.645	15 (11.5-19)	0.036
<b>Lat spin flex, total, cm</b>	29 (19.5-34)	0.010	16.5 (9.3-28.3)	1.000	18.0 (11.1-24.4)	0.004
<b>Thoracolumb flex, cm</b>	9.0 (6-10.5)	0.000	5.8 (2.5-8)	1.000	5.5 (3.6-7.9)	0.002
<b>Lumbar flexion, cm</b>	4.0 (3-5)	0.003	3.0 (1-4)	0.822	3.1 (2-4.5)	0.090
<b>Max intermall dist, cm</b>	113 (93.8-122.5)	0.099	100 (84.8-107.5)	1.000	92 (81-106.5)	0.016

AS=Ankylosing Spondylitis, G = Group, BASMI = Bath Ankylosing Spondylitis Metrology Index

## RESULTS

- 126 patients with AS vs. 57 with nr-axSpA were included in the study, mean (SD) age 48.4 (13.7) vs. 41.6 (11.4) years and 23% vs. 46% were women, table 1.
- In AS, lumbar, and thoracic measures, vital capacity and the BASMI composite score were the first measures to deteriorate in relation to disease duration (G1 vs. G2,  $p < 0.035$ ). Late in the disease all measures had deteriorated (G1 vs. G3,  $p < 0.036$ ) table 2.
- Patients with nr-axSpA presented better scores in lumbar, hip and thoracic spinal measures compared to patients with AS ( $p < 0.05$ ), data controlled for sex and disease duration, table 3a and 3b.
- In early disease ( $\leq 17$  years) also cervical measures ( $p < 0.05$ ) were less affected in the nr-axSpA group compared to patients with AS.

Table 3 b. Results from the linear regression analysis showing b (parameter estimates) and 95% confidence intervals (95% CI) of spinal mobility measures with regard to AS or nr-axSpA controlled for gender and disease duration.

	Cervical flexion/extension		Cervical lateral-flexion		Chest expansion		Vital capacity		Thoracic flexion		Thoracolumbar flexion	
	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=	b (95% CI)	p=
<b>AS</b>	-9.887 (-20.974 - -1.199)	0.080	-5.462 (-13.774 - -2.849)	0.196	-0.533 (-1.124 - 0.059)	0.077	-0.299 (-0.664 - 0.067)	0.108	-0.162 (-0.515 - 0.188)	0.359	-1.516 (-2.448 - -0.585)	0.002
<b>nr-axSpA</b>	0		0		0		0		0		0	
<b>Women</b>	6.805 (-3.326 - 16.937)	0.187	5.952 (-1.617 - 13.520)	0.122	-0.223 (-0.774 - 0.328)	0.425	-1.283 (-1.626 - -0.941)	0.000	0.392 (0.066 - 0.719)	0.019	0.376 (-0.482 - 1.236)	0.385
<b>Men</b>	0		0		0		0		0		0	
<b>Disease-duration</b>	-0.805 (-1.187 - -0.424)	0.000	-0.712 (-0.990 - -0.434)	0.000	-0.056 (-0.077 - -0.036)	0.000	-0.043 (-0.054 - -0.032)	0.000	-0.028 (-0.041 - -0.016)	0.000	-0.080 (-0.112 - -0.048)	0.000

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