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SAT0307

LONG-TERM ASSOCIATION BETWEEN DISEASE ACTIVITY MEASURED BY ASDAS AND PHYSICAL FUNCTION IN A LARGE EARLY AXIAL SPONDYLOARTHRITIS COHORT

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Background: The Ankylosing Spondylitis Disease Activity Score (ASDAS) has been progressively replacing the Bath Ankylosing Spondylitis Disease Activity Score (BASDAI) as the main disease activity measure to assess patients with axial spondyloarthritis (axSpA), both in the research context as well as in clinical practice. However, further evidence is needed to show its meaningfulness regarding the longitudinal relationship with physical function.

Objectives: To study the long-term association between disease activity and physical function in axSpA.

Methods: DESIR is a prospective observational cohort of patients with recent onset (<3 years) inflammatory back pain, suggestive of axSpA. We analysed data collected during the first five years of follow-up and selected patients with a definite diagnosis of axSpA according to the treating rheumatologist. Physical function was assessed using the Ankylosing Spondylitis Health Assessment Questionnaire (HAQ-AS). Disease activity was measured using the ASDAS C-reactive protein (ASDAS-CRP) and BASDAI. In a first step, associations between HAQ-AS (dependent variable) and disease activity (defined by ASDAS or BASDAI), clinical and demographic variables were tested in univariable models. Multivariable models were then built adjusting for potential confounding factors found to be significant in the univariable analysis.

In a second step, additional multivariable analysis was conducted using the Chi-square Automatic Interaction Detector (CHAID) method, with HAQ-AS as dependent variable. The following independent variables were tested: ASDAS/BASDAI, enthesitis score, arthritis, employment status, gender, symptom duration, body mass index (BMI), HLA-B27 status, treatment with non-steroidal anti-inflammatory drugs (NSAID), conventional disease modifying anti-rheumatic drugs (cDMARD) and TNF-blockers. The final model fixed as criteria: 70 parent nodes and 20 child nodes to create new generations in the decision tree.

Results: Data from 644 patients and 4944 visits were analysed. There was a significant independent association between HAQ-AS and gender, employment status, peripheral arthritis, ASDAS-CRP/BASDAI, enthesitis, NSAID and anti-TNF treatment (Table 1). The decision tree revealed ASDAS as the first variable with discriminative power on HAQ-AS, according to the following cut points: 1.3, 2.2 and 2.4. In addition, for ASDAS values above 3.5 the model yield a higher number of

explanatory variables setting different patients' profiles regarding their functional status, namely: gender, anti-TNF and NSAID treatment. Notably, the ASDAS cut-offs that separated different patient profiles largely mimicked the cut-offs previously defined for ASDAS disease activity states (inactive, low, high and very high disease activity). According to this hierarchical model, gender, anti-TNF treatment and enthesitis score were the next variables explaining HAQ-AS variation, followed by employment status and NSAID treatment.

Conclusion: We have shown that disease activity contributes longitudinally to physical function and that it is hierarchically superior to any other variables or disease domains. Previously defined ASDAS-CRP disease activity categories identified different patient profiles on the hierarchical analysis.

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None.

Table 1. GEE models for HAQ-AS (dependent variable) in axSpA

Characteristics	Univariable analysis, OR (95% CI)	Multivariable analysis taking ASDAS-CRP into account, adjOR (95% CI)	Multivariable analysis taking BASDAI into account, adjOR (95% CI)**
Age, years	1.00 (1.00-1.05)	NA	NA
Male gender	0.73 (0.68-0.78)	0.82 (0.78-0.86)	0.84 (0.80-0.88)
BMI, Kg/m ²	1.01 (1.00-1.01)	*	*
HLA-B27 positive	0.84 (0.78-0.90)	*	*
Symptoms duration, years	0.98 (0.98-0.99)	*	*
Currently employed	0.95 (0.91-0.99)	0.95 (0.91-0.98)	0.95 (0.91-0.98)
Current smoker	1.01 (0.98-1.05)	NA	NA
Peripheral arthritis	1.21 (1.13-1.30)	1.10 (1.04-1.16)	1.09 (1.03-1.16)
ASDAS-CRP	1.26 (1.24-1.29)	1.25 (1.23-1.27)	NA
BASDAI	1.01 (1.01-1.01)	NA	1.01 (1.01-1.01)
Enthesitis score (0 to 39)	1.02 (1.02-1.03)	1.01 (1.01-1.02)	1.01 (1.01-1.01)
Modified NY criteria	0.95 (0.89-1.01)	NA	NA
MRI sacroiliitis	1.01 (0.96-1.07)	NA	NA
msASSS score	0.99 (0.98-1.01)	NA	NA
NSAIDs (last 6 months)	1.13 (1.09-1.16)	1.03 (1.01-1.06)	1.03 (1.01-1.06)
cDMARDs (last 6 months)	1.09 (1.03-1.14)	*	*
TNF-blocker (last 6 months)	0.92 (0.88-0.96)	1.07 (1.03-1.11)	1.04 (1.01-1.08)

* Not selected for this model; NA – not applicable; ** Model adjusted with the cofactors considered significant in the proposed multivariable model for ASDAS (previous column)

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SAT0308

CLUSTER-BASED SPONDYLOARTHRITIS PHENOTYPES DEFINED AT BASELINE ARE PREDICTIVE OF 5-YEAR SEVERITY OUTCOME IN THE DESIR COHORT

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Background: The course of axial spondyloarthritis (SpA) is heterogeneous, varying from mild to severe and remains to be better defined. DESIR is a French cohort of early undifferentiated axial SpA that are longitudinally followed-up, offering such opportunity. We recently performed a cluster analysis in the DESIR cohort, according to baseline characteristics and identified 2 clusters: one characterized by an isolated axial disorder (A for axial) and one by additional high frequency of peripheral

manifestations (B for both)¹. Those cluster-based SpA phenotypes could correspond to different levels of disease severity.

Objectives: To assess whether cluster-based SpA phenotypes defined at baseline are conserved over time and might predict disease outcome at follow-up.

Methods: We analysed longitudinal data from the 586 patients who completed all follow-up visits until 5-year (mo 6, 12, 18, 24, 36, 48 and 60) out of the 679 patients included in the DESIR cohort used to define clusters at baseline. We performed a linear mixed-effect analysis for quantitative variables (using lme4 R package) and a generalized linear mixed-effect analysis for qualitative variables (using glmer R package) with cluster and follow-up visits as fixed effects and subjects as random effect. *P*-values were obtained by likelihood ratio tests of the full model with cluster against the model without cluster as fixed effects.

Results: Over the time, both clusters continued to show sustainable consistent differences characterized by higher frequency of peripheral involvement, higher disease activity, worse patient-reported outcome, higher frequency of conventional DMARDs and TNF blockers usage in cluster B, and higher frequency of radiographic and MRI sacroiliitis at 2 and 5 years in cluster A (Table).

Variable*	Fixed effect estimate ± standard error**	P-value
BASDAI	7.28 ± 1.08	3 × 10 ⁻⁷
ASDAS-CRP	0.22 ± 0.06	1.3 × 10 ⁻⁴
HAQ	0.20 ± 0.03	4.4 × 10 ⁻⁸
Presence of at least one synovitis	0.95 ± 0.21	1.5 × 10 ⁻⁷
Swollen joint count	0.09 ± 0.03	0.001
Enthesitis clinical score (MASES)	1.81 ± 0.34	1.3 × 10 ⁻⁷
TNF blocker-usage	1.81 ± 0.54	5.2 × 10 ⁻⁸
Conventional DMARDs usage	2.00 ± 0.38	4.9 × 10 ⁻¹⁶
Radiographic sacroiliitis	-0.92 ± 0.62	0.002
MRI sacroiliitis	-0.76 ± 0.23	5.4 × 10 ⁻⁵

* All the variables have been recorded at all the follow-up visits except radiographic and MRI sacroiliitis which have been evaluated at inclusion, 2 and 5 years.

** Cluster B compared to cluster A

Table – Significant results of the linear mixed effect and generalized linear mixed-effect analysis.

Conclusion: Cluster-based SpA phenotypes defined at baseline in the DESIR cohort were predictive of severity outcome after 5 years. Patients from cluster A were more prone to develop sacroiliitis despite lower disease activity over the time, whereas those from cluster B had poorer clinical outcome and higher need for conventional DMARDs and TNF blockers.

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SAT0309

CLINICAL, IMAGING AND BIOLOGIC FEATURES OF SPONDYLOARTHRITIS IN AN AT-RISK POPULATION: DATA FROM THE PRE-SPA COHORT

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Background: Diagnosis in axial spondyloarthritis (axSpA) is challenging and often delayed by several years, resulting in a delay in treatment.

Previously we reported presence of spondyloarthritis (SpA) features and imaging abnormalities in first-degree relatives (FDRs) of HLA-B27 axSpA patients, who are at risk of developing axSpA [1]. Follow up of these at risk individuals could help to identify clinical signs, imaging abnormalities or biomarkers that are predictive of development of axSpA.

Objectives: To investigate imaging, biologic and/or clinical signs of SpA at baseline and after 1 year follow up, as well as development of clinically manifest axSpA after 1 year follow up in at risk individuals.

Methods: The Pre-SpA cohort[1] is a prospective inception cohort in which FDRs of HLA-B27 positive axSpA patients are included and followed for 5 years. The main exclusion criteria were: a diagnosis of SpA at baseline and back pain with a previous non-rheumatic diagnosis, such as spinal disc herniation. Clinical and biologic characteristics were collected at baseline and after 1 year. Imaging was performed at baseline including MRI of the sacroiliac joints (SIJ) and X-rays of the cervical and lumbar spine and SIJ. MRIs were scored according to the ASAS definition for a positive MRI by two readers. X-rays were scored according to the modified New York (mNY) criteria for ankylosing spondylitis by two readers.

Results: In the current study we report the characteristics of 201 participants at baseline and 123 participants after one year of follow-up. 126 (62.7%) participants reported back pain, of which 39(19.4%) fulfilled criteria for inflammatory back pain. Median [IQR] VAS total back pain (0-100mm) was 11 (0-28). Six (2.9%) were previously diagnosed with arthritis by a physician, nine(4.4%) with enthesitis and one(0.5%) with dactylitis. In none of these participants a diagnosis of SpA was made. Seven participants were previously diagnosed with an extra-articular manifestation possibly related to SpA: four with psoriasis and three with anterior uveitis. Three (1.5%) participants fulfilled the mNY criteria for sacroiliitis on radiography. Ten (5%) participants had bone marrow edema on MRI of the SIJ suggestive of SpA. Fifty-six (27.8%) participants would have fulfilled ASAS classification criteria for axSpA if they would have had a clinical diagnosis of axSpA. After one year patient-reported disease activity variables remained stable; median [IQR] VAS total back pain (0-100mm) was still low: 4[0-24]. During one year of follow-up, in total seven participants developed symptoms and were clinically diagnosed with axSpA.

Conclusion: Imaging signs and clinical signs of SpA are present in a substantial proportion of seemingly healthy FDRs of HLA-B27 positive AxSpA patients. Twelve (6.0%) participants had imaging suggestive of SpA, but a clinical diagnosis of axSpA was still rare after one year of follow up (5.7%). Future follow-up will increase numbers of individuals diagnosed with axSpA and help us identify early symptoms and signs of SpA in this at risk population.

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