outcome, HLA-B27 and imaging positivity were associated with a diagnosis of axSpA in both sexes (male patients: HLA-B27+: OR 3.8, 95% CI: 1.7 to 8.8; MRI-SIJ+: OR 24.3, 95% CI: 9.7 to 60.6; X-SIJ+: OR 2.7, 95% CI: 0.7 to 9.4 and female patients: HLA-B27+: OR 6.7 95% CI: 3.2 to 14.0; MRI-SIJ+: OR 32.6 95% CI: 14.2 to 75.0; X-SIJ+: OR 6.9 95% CI: 1.4 to 32.7). In models with imaging positivity as the outcome, male gender and HLA-B27 positivity were both independently associated with MRI+and/or X-SI+ (OR 1.8, 95% CI: 1.0 to 3.1 and OR 1.8 (1.0–3.3).

Abstract OP0323 – Table 1 Characteristics of patients with a definite diagnosis of axial spondyloarthritis (level of confidence $\geq 7/10$), comparison between genders (n=301)

	Male N=146	Female N=155	p-value
Age at CBP onset (years), mean (SD)	27.4 (7.5)	29.5 (7.8)	0.021
Duration BP (months), mean (SD)	13.3 (7.1)	13.4 (7.0)	0.49
Alternating buttock pain	65 (60)	64 (51)	0.15
IBP	123 (84)	129 (84)	0.98
Response to NSAIDs	92 (64)	98 (66)	0.79
Family history of SpA	68 (47)	69 (45)	0.79
Peripheral arthritis	37 (25)	34 (22)	0.52
Heel enthesitis	46 (31)	51 (33)	0.73
Dactylitis	16 (11)	16 (10)	0.87
Uveitis	19 (13)	20 (13)	0.98
Psoriasis	22 (15)	37 (24)	0.051
IBD	10 (7)	12 (8)	0.75
HLA-B27 positive	114 (80)	92 (60)	<0.001
Elevated CRP/ESR	71 (49)	64 (42)	0.23
SpA features without imaging or HLA-B27, mean (SD)	3.5 (1.7)	3.5 (1.6)	0.99
MRI-SIJ+/X-SIJ-,	65 (45)	68 (44)	0.91
MRI-SIJ-/X-SIJ+	5 (3)	5 (3)	0.92
MRI-SIJ+/X-SIJ+	44 (30)	26 (17)	0.006
Any positive imaging	114 (78)	99 (64)	0.007

Results are presented as n (%) unless otherwise indicated. AxSpA= axial spondyloarthritis CBP=chronic back pain; HLA=human leukocyte antigen; IBP=inflammatory back pain; IBD=inflammatory bowel disease; NSAIDs=non-steroidal anti-inflammatory drugs; CRP= C reactive protein; ESR=erythrocyte sedimentation rate; MRI=magnetic resonance imaging; SIJ= sacroiliac joints; X=X rays; any positive imaging= MRI-SIJ + and/or X-SIJ +. All features were complete in at least 95% of patients unless specified otherwise. Bold indicates significant results.

Conclusions: Although our data show clear gender differences in early axSpA, they highlight that in both genders HLA-B27 and imaging are key elements for a diagnosis of axSpA. Therefore, our study does not suggest that separate diagnostic strategies are required for men and women.

Disclosure of Interest: None declared

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Understanding the language of basic research, epidemiology and health services articles

OP0324 RISK OF SERIOUS INFECTIONS IN RHEUMATOID ARTHRITIS PATIENTS TREATED WITH ABATACEPT, RITUXIMAB AND TOCILIZUMAB IN DENMARK AND SWEDEN

K.L. Grøn¹, E. Arkema², B. Glinthorg¹, F. Mehnert¹, M. Østergaard¹, L. Dreyer¹, M. Nørgaard¹, N.S. Krogh¹, J. Askling², M. Heltand¹, on behalf of all departments that have contributed with data and the ARTIS Study Group. ¹The DANBIO registry and the Danish Departments of Rheumatology, Copenhagen, Denmark; ²Department of Medicine Solna, Karolinska Institutet, Stockholm, Sweden

Background: Safety concerns have been raised regarding the risk of serious infections (SI) with the different available biologic disease-modifying anti-rheumatic drugs (bDMARDs). Little is known about the risk of SI in patients with rheumatoid arthritis (RA) treated with non-tumor-necrosis-factor-inhibitors (non-TNFi) bDMARDs.

Objectives: In RA patients treated in routine care with the three non-TNFi, abatacept, rituximab and tocilizumab 1) to compare crude as well as adjusted incidence

rates (IR) of SI after the first year of treatment, and 2) to estimate the relative risk (RR) of SI across these drugs after 1 year of treatment.

Methods: Collaborative observational cohort study conducted in Denmark (DK) and Sweden (SE) in parallel. RA patients in DANBIO (DK) and ARTIS/SRQ (SE) who started a non-TNFi treatment Jan 2010–Dec 2015 were included and their clinical characteristics at baseline were identified. Baseline comorbidities, reimbursed antibiotic prescriptions and incident SI (hospitalisation listing infection as major cause of admission) were identified through linkage to National Patient Registries and Prescription Drug Registries. IR of SI per 100 patient years (adjusted for age and sex) and rate ratios (as estimates of RR, adjusted for additional covariates) during 1 year treatment were assessed via Poisson regression.

Results: 8987 treatment episodes were identified (abatacept 2,725/rituximab 3,363/tocilizumab 2,899). Differences in baseline characteristics between the three drugs were observed (table 1). During the first year of treatment, 456 SI were identified. Across all three non-TNFi there was a non-significant tendency towards higher IRs in DK than in SE. Age/sex-adjusted IRs for SI were similar across treatments in each country (abatacept/rituximab/tocilizumab for SE 6.0/6.4/4.7 and for DK 7.1/8.1/6.1, respectively). The 1 year adjusted between-drug comparisons (=RR) were formally non-significant (table 1).

Abstract OP0324 – Table 1 Baseline characteristics, IR and RR of RA patients starting non-TNFi stratified by drug and country

Variable	ABA, N=2725		RTX, N=3363		TCZ, N=2899	
Country	DK	SE	DK	SE	DK	SE
Treatment episodes, n	830	1895	718	2645	1098	1801
Female gender, %	78	81	78	76	78	79
Age, years	59(50-67)	61(51-69)	61(52-69)	64(54-71)	59(50-67)	59(49-67)
Disease duration, yrs	7(3-16)	11(6-21)	11(6-19)	13(6-22)	8(3-16)	11(5-20)
DAS28	4.7(3.9-5.5)	4.9(4.1-5.7)	4.9(4.0-5.6)	5.0(4.1-5.8)	5.0(4.1-5.8)	5.1(4.2-6.0)
HAQ	1.4(0.8-1.9)	1.3(0.9-1.8)	1.5(1-2)	1.3(0.9-1.8)	1.4(1-2)	1.3(0.9-1.8)
CRP, mg/L	8(3-20)	8(4-21)	10(4-25)	10(4-25)	11(4-30)	11(4-30)
Previous cancer, %	1	4	9	11	1.7	4
Incidence rates (IR) of serious infections, 0-12 months						
Person years	568	1477	571	2189	906	1426
Infections, n	40	90	50	156	55	65
IR (95%CI)*	7.1(5.1, 9.9)	6.0(4.8, 7.5)	8.1(5.9, 11.0)	6.4(5.3, 7.7)	6.1(4.6, 8.1)	4.7(3.7, 6.1)
Risk Ratios (RR) for serious infections, 0-12 months**						
ABA vs TCZ (ref)						
Adjusted RR (95%CI)	1.15	1.13	0.94	0.86	0.82	0.77
	(0.69, 1.90)	(0.83, 1.54)	(0.55, 1.60)	(0.65, 1.13)	(0.50, 1.36)	(0.57, 1.03)
ABA vs RTX (ref)						
Adjusted RR (95%CI)	1.15	1.13	0.94	0.86	0.82	0.77
	(0.69, 1.90)	(0.83, 1.54)	(0.55, 1.60)	(0.65, 1.13)	(0.50, 1.36)	(0.57, 1.03)
TCZ vs RTX (ref)						
Adjusted RR (95%CI)	1.15	1.13	0.94	0.86	0.82	0.77
	(0.69, 1.90)	(0.83, 1.54)	(0.55, 1.60)	(0.65, 1.13)	(0.50, 1.36)	(0.57, 1.03)

DK=Denmark, SE=Sweden

*adjusted for age and gender, ** Adjusted for age, sex, DAS28, smoking, disease duration, HAQ, previous serious infection, previous cancer, previous chronic obstructive pulmonary disease and tertiles of antibiotic prescriptions. Numbers are medians (IQR) unless otherwise stated. End of follow-up was July 2015 in DK and December 2015 in SE

Conclusions: The risk of SI across treatment with non-TNFi ranged between 4.7 and 8.1/100 patient years after 1 year, but no significant differences were observed between specific drugs. The numerical between-drug differences may partly be explained by differences in baseline characteristics.

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OP0325 EFFECT OF THREE HEALTH IT INTERVENTIONS ON RA DISEASE ACTIVITY SCORE DOCUMENTATION IN AN ACADEMIC RHEUMATOLOGY CLINIC

J. Gandrup¹, J. Li¹, Z. Izadi¹, T. Ellingsen², J. Yazdany¹, G. Schmajuk^{1,3}. ¹University of California, San Francisco, San Francisco, USA; ²Odense University Hospital, Odense, Denmark; ³San Francisco VA Medical Center, San Francisco, USA

Background: Routine assessments of disease activity are a key part of high quality rheumatoid arthritis (RA) care. Recommendations published in 2012 detailed the preferred disease activity measures, but little has been published about how to best implement these measures to guide routine clinical practice.

Customization of the electronic health record (EHRs) provides an opportunity to systematically collect disease activity scores in order to adequately implement treat-to-target approaches to RA treatment.

Objectives: To evaluate the overall impact of three health information technology (IT) initiatives at the point of care on the proportion of RA patient visits with disease activity scores recorded in an academic outpatient clinic.

Methods: We studied three initiatives designed to facilitate disease activity score documentation: 1. An EHR flowsheet, 2. Public reporting of physicians' performance, 3. An EHR SmartForm to facilitate the calculation and documentation of a validated RA measure, the Clinical disease activity index (CDAI). The initiatives were implemented at different time points over the study period. The study cohort included all adult RA patients with at least 2 face-to-face encounters in the outpatient rheumatology clinic at University of California, San Francisco between June 2012 – June 2017. Clinical data and covariates were retrieved from the EHR data warehouse.

To examine trends in CDAI documentation over time, we created a quality control chart (p-chart) (figure 1, where vertical lines indicate onset of each of the initiatives). For each initiative, we analysed our data using a two-pronged pre-post approach. First, we developed multiple logistic regression models in which the outcome was documentation of CDAI, controlling for patient age, sex, race/ethnicity, language and insurance category as well as physician sex and years in practice. Second, logistic mixed effect models were used to account for repeated visits by patients to the clinic and clustering by physicians.

Results: We included data from 7406 encounters from 978 unique patients. Mean (SD) age was 58.9 (16) years, 82% were female, 44% were racial/ethnic minorities, and 59% had public insurance. Over a 60 month period, overall documentation of CDAI scores per month in the clinic increased from 0% to 64% (figure 1). Results from mixed effect logistic modelling showed that Initiative 1 significantly increased CDAI recordings (OR=40.14 $p<0.001$); Initiative 2 further increased recordings (OR=2.86, $p<0.001$); Initiative 3 decreased the probability of CDAI being recorded (OR=0.61, $p<0.001$). No systematic differences were found across patient demographics or provider sex and years in practice.

Abstract OP0325 – Figure 1 proportion of visits per month with CDAI documentation during implementation of quality improvement initiatives

Conclusions: Introduction of a flowsheet and public reporting of physician performance within the practice significantly improved performance, but institution of the SmartForm did not further improve on these gains. However, gains were maintained through the end of the five-year study period. Future work should focus on whether improved CDAI documentation is associated with improved patient outcomes, such as lower disease activity and improved physical function.

Disclosure of Interest: None declared

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The stromal link to inflammation

OP0326

MODELLING THE INTERACTION BETWEEN DISEASE MICROENVIRONMENT AND MESENCHYMAL STEM CELLS IN SCLERODERMA

Z. Taki¹, B. Abdi Ahmed¹, E. Gostjeva², C. Venturini³, C. Denton¹, A. Salama⁴, H. Lopez^{1,5}, B. Stratton¹. ¹Centre for Rheumatology and Connective Tissue Diseases, UCL, London, UK; ²Biological Engineering, MIT, Cambridge MA, USA; ³Pathogen Genomics Unit, ⁴Renal Medicine, UCL, London, UK; ⁵Murigenics Inc, Vallejo CA, USA

Background: Mesenchymal stem cells (MSCs) are pleuripotent bone marrow and tissue resident cells implicated in homeostasis and tissue repair. Systemic

sclerosis (scleroderma, SSc) is a severe connective tissue disease characterised by progressive fibrotic thickening of the dermis, accompanied by loss of subcutaneous fat and microvasculature. Aberrant activation of MSCs within the disease microenvironment may underlie the persistent fibrotic repair process, or account for the failure of adipogenesis and dysregulated vascular repair.

Objectives: We sought to: 1) determine whether activated MSCs are present within the SSc involved skin lesions, 2) test whether SSc suction blister fluid (BF) derived from involved forearm skin can induce phenotype changes in MSCs, 3) fully profile the altered gene expression in MSCs exposed to SSc BF, 4) investigate the role of key factors present at increased level in SSc BF (IL-31, lactate).

Methods: Novel post-fixation collagenase tissue dissociation techniques applied to 1 mm tissue sections, combined with Feulgen staining of DNA, were used to identify MSCs undergoing metakaryotic division within the involved skin of SSc patients. Fat derived MSCs from healthy controls were treated in tissue culture with blister fluid derived from the fibrotic skin lesions or from matched sites in healthy individuals, or exposed to key constituent factors, including cytokines (IL-31, 50 ng/ml), metabolites (lactate, 25 mM), and enhanced stiffness matrix (50 kPa gels). The responses of MSCs were studied by analysis of next generation sequencing (NGS) and phenotype changes.

Results: MSCs undergoing metakaryotic division were identified in SSc skin biopsy material but not in healthy control (HC) tissue (SSc vs HC, superficial dermis 0 vs 0, mid dermis 1.1 vs 0 $p<0.0001$, deep dermis 1.4 vs 0 $p<0.0001$ metakaryotic cells per x20 field). SSc BF (diluted 1:125 in media) induced disease-relevant phenotype changes in MSCs, such as α SMA expression ($p<0.05$), collagen gel contraction ($p<0.002$) and scratch wound repair ($p<0.016$), as well as loss of adipogenic potential, more than control BF or media alone, due in part to elevated IL-31 and lactate. NGS indicated that SSc blister fluid induced treatment-specific gene expression in MSCs (figure 1), more differentially than in normal dermal fibroblasts, consistent with activation of fibrosis, wound repair, migration, osteogenesis, connective tissue formation and loss of angiogenesis/vascular repair. Induction of α SMA in MSCs was dependent on the matrix stiffness in model systems.

Conclusions: Factors present at elevated levels in the disease microenvironment, including cytokines and metabolites, as well as the stiffened ECM, are capable of promoting the migration and differentiation of fat derived MSCs, towards tissue reparative cells implicated in the fibrotic process. Conversely, the adipogenic and vascular regenerative potential of these cells may be reduced by exposure to the SSc microenvironment.

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