Objectives: In this analysis, we aimed at determining the predictors of ON in a longitudinal lupus cohort in which Caucasian and African-American ethnicities are well represented.

Methods: The data were reviewed from the initiation of the cohort in 1987 until October 2019. 2428 patients were included in the analysis based on 224295 person-months of follow-up. ON was recorded using the Systemic Lupus Erythematosus International Collaborating Clinics/ American College of Rheumatology (SLICC/ACR) Damage Index. To calculate the rate of ON in each demographic and clinical subgroup, we calculated the number of ON events divided by the number of person-months at risk and converted this rate to rates per person-year. To assess the relationship between risk factors and rates of ON events, we used the pooled logistic regression. Rate ratios were adjusted for age. After identifying a set of variables related to ON incidence, we fit a final multivariable model to identify the most important risk factors for incident ON.

Results: 287 ON cases were identified, giving a point prevalence of 11%. ON cases that occurred before cohort entry were excluded. 122 incident events of ON occurred after cohort entry and were included in the final analysis. In the multivariable analysis, African-Americans were at twice the risk for ON compared to Caucasians. Male gender and smokers had about 80% and 50% increased risk of ON compared to females and non-smokers respectively. For every 10 year increase in the age there was a 20% reduced risk for ON. Patients diagnosed after the 1990's had a 50% reduced risk of ON compared to those diagnosed before 1990's. A highest daily dose of prednisone of 40 mg or higher, even when administered for a month or less, increased significantly the risk of ON. Use of pulse steroid was not associated with an increased risk of ON.

Conclusion: Ethnicity remains an important determinant in the risk of ON. African-American SLE patients are at double the risk of ON compared to Caucasians. APOL1 risk variants confer an increased risk of ON in this high-risk ethnic group. Oral prednisone more than 40mg daily administered for a month or less, at any point in the disease course, remains the most important predictor of ON. Prednisone-free or prednisone-limited regimens should be reinforced in SLE trials.

Table 1. Associations between ON rates and corticosteroids dose and duration based on a multivariable model

Predictor		RR (95% CI)	p-value
Max prednisone and duration	0- 40 mg/day for <=1 month	1.00 (Ref)	
	0- 40 mg/day for >1 month	1.49 (0.68, 3.26)	0.3162
	40-60 mg/day for <=1 month	2.76 (1.18, 6.39)	0.0182
	40-60 mg/day for >1 month	3.87 (1.73, 8.62)	0.0009
	>=60 mg/day for <=1 month	6.6 (3.37, 12.93)	<0.0001
Sex	>=60 mg/day for >1 month	5.15 (2.55, 10.4)	<0.0001
	Male (vs. Female)	1.79 (1.04, 3.10)	0.0373
Ethnicity	African American (vs. Caucasian)	1.94 (1.32, 2.83)	0.0007
Year of SLE diagnosis	1990 and after (vs. before 1990)	0.53 (0.36, 0.77)	0.0008
Age	Per 10 year increase	0.77 (0.66, 0.89)	0.0006
Smoking	Ever (vs. never)	1.51 (1.04, 2.19)	0.0293

Table 2. Associations between ON rates and pulse steroid stratified by max prednisone

Subgroup	No. of ONs	Person years	Rate per 1000 person years	Age-adjusted RR (95% CI)	Age-adjusted p-value
Pulse among those with maximum prednisone dose of <40 mg	No	21	6752.1	3.11	1.00 (Ref)
	Yes	2	387.8	5.16	1.69 (0.40, 7.20)
Pulse among those with maximum prednisone dose of >=40 mg	No	88	7202.3	12.2	1.00 (Ref)
	Yes	8	959.2	8.3	0.71 (0.35, 1.48)
Pulse among those with maximum prednisone dose of >=60 mg	No	64	4329.9	3.11	1.00 (Ref)
	Yes	7	622.4	5.16	0.79 (0.36, 1.72)

Acknowledgments: The Hopkins Lupus Cohort was funded by NIH Grant R01-AR069572

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.5073

FRI0174

THE LONGER THE DELAY IN DIAGNOSIS, THE WORSE THE OUTCOME IN SLE – CROSS SECTIONAL ANALYSIS OF A GERMAN LONG-TERM STUDY (LULA COHORT)

A. Kernder¹, J. Richter¹, R. Fischer-Betz¹, B. Winkler-Rohlfing², M. Aringer³, M. Schneider¹, G. Chehab¹. ¹Department of Rheumatology & Hiller-Research Unit Rheumatology, Düsseldorf, Germany; ²German Lupus Self-Help

Community, Wuppertal, Germany; ³University Medical Center and Faculty of Medicine Carl Gustav Carus, Division of Rheumatology, Department of Medicine III, Dresden, Germany

Background: Patients with systemic lupus erythematosus (SLE), even compared to those with other rheumatic diseases, are thought to often experience a long delay from the onset of symptoms to diagnosis.

Objectives: Our aim was to study the association of this delay to the long-term outcome of the disease.

Methods: Information on demographics, onset of first symptoms, first physicians visit, time of diagnosis and organ involvement was assessed by self-reported questionnaires among SLE patients in Germany in 2011 (LuLa cohort, n=585). Disease related damage (Brief Index of Lupus Damage; BILD), disease activity (Systemic Lupus Activity Questionnaire; SLAQ) and health related quality of life (SF-12) were chosen as proxies for outcome. The association to the outcome of the disease was analyzed by linear regression analysis, adjusted for age, disease duration, organ involvement and sex.

Results: In our cohort, the mean reported duration between the onset of symptoms and the diagnosis of SLE was 46 months (SD 73), which includes 13 months (SD 41) between the onset of symptoms and the first physicians visit. The participating patients were diagnosed between 1960 and 2004.

Linear regression analysis revealed that longer time to diagnosis was associated with (i) higher disease activity (SLAQ, p<0.0001, β =0.199), (ii) higher disease-related damage (BILD, p=0.002, β =0.137) and (iii) lower health-related quality of life (SF-12 physical p=0.004, β =-0.136, SF-12 mental p=0.004, β =-0.143) in the year 2011. The organ involvement at the time of diagnosis did not alter these results.

Conclusion: A delay in diagnosis was associated with a worse outcome in SLE (disease activity, disease-related damage and health-related quality of life). Therefore, an early diagnosis seems to be important to improve the long-term outcome of the disease. It will be interesting to see whether adopting the new EULAR/ACR 2019 classification criteria can contribute to a faster diagnosis and a better outcome in consequence.

The LuLa study is supported by unrestricted grants from GlaxoSmithKline and UCB Pharma.

Disclosure of Interests: Anna Kernder Grant/research support from: Grant/research support from: GlaxoSmithKline and UCB Pharma for performing the LuLa-study., Jutta Richter Grant/research support from: Grant/research support from: GlaxoSmithKline and UCB Pharma for performing the LuLa-study., Rebecca Fischer-Betz Consultant of: UCB, Speakers bureau: Abbvie, Amgen, Biogen, BMS, Celgene, Chugai, GSK, Janssen, Lilly, Medac, MSD, Novartis, Roche, UCB, Pfizer., Borge Winkler-Rohlfing: None declared, Martin Aringer Consultant of: Boehringer Ingelheim, Roche, Speakers bureau: Boehringer Ingelheim, Roche, Matthias Schneider Grant/research support from: GSK, UCB, Abbvie, Consultant of: Abbvie, Alexion, Astra Zeneca, BMS, Boehringer Ingelheim, Gilead, Lilly, Sanofi, UCB, Speakers bureau: Abbvie, Astra Zeneca, BMS, Chugai, GSK, Lilly, Pfizer, Sanofi, Gamal Chehab Grant/research support from: Grant/research support from: GlaxoSmithKline and UCB Pharma for performing the LuLa-study.

DOI: 10.1136/annrheumdis-2020-eular.1595

FRI0175

SEMI-DYNAMIC MRI OF THE EXTENSOR DIGITORUM TENDONS IN JACCOUD ARTHROPATHY

T. Kirchgesner¹, M. Stoeniou¹, N. Michoux¹, X. Libouton¹, F. Houssiau¹, B. Vande Berg¹. ¹Cliniques Universitaires Saint-Luc, Woluwe-Saint-Lambert, Belgium

Background: Jaccoud arthropathy (JA) is a rare joint deformity mostly associated with systemic lupus erythematosus (SLE) (1). JA may be defined as a reversible deformity of the hands during flexion with ulnar deviation and swan neck deformities of the fingers. The physiopathology and the mechanisms leading to JA still remain to be elucidated.

Objectives: To test the hypothesis that Jaccoud arthropathy (JA) in systemic lupus erythematosus (SLE) patients is associated with abnormal extensor digitorum (ED) tendons displacement during flexion of the metacarpophalangeal (MCP) joints.

Methods: 16 SLE patients with JA (JA+), 12 SLE patients without JA (JA-) and 24 control subjects were included in the study. Transverse spin echo T1-weighted MR sequences of the MCP joints in flexion and in extension were obtained in each hand of SLE patients and in one randomly-selected hand of control subjects. Two radiologists separately measured the amplitude and the direction of the displacement of the ED tendons with respect to the midline at the level of the MCP joints. Statistical analysis included two-way ANOVA with random effects to assess differences in amplitude (p<0.0083), Fisher-Freeman-Halton exact test to

assess differences in direction ($p < 0.0063$) and Gwet's AC1 score to determine interobserver agreement.

Results: Amplitude of the displacement of the ED tendons was statistically significantly higher in JA+ patients than in JA- patients and controls in flexion for both readers ($p < 0.0001$) and in extension for one reader ($p < 0.0048$). Ulnar deviation of the ED tendons was statistically significantly more frequent in JA+ patients than in JA- patients and controls in flexion and in extension for both readers ($p < 0.0001$). Interobserver agreement for the assessment of displacement was moderate to very good ($0.51 \leq \kappa \leq 0.93$).

Conclusion: JA is associated with abnormal displacement of the ED tendons in flexion and extension. Abnormal displacement of the ED tendons is absent in patients without JA.

References:

- [1] Santiago MB. Miscellaneous non-inflammatory musculoskeletal conditions. Jaccoud's arthropathy. Best Pract Res Clin Rheumatol. 2011;25(5):715-25.

Figure 1. Axial spin echo T1-weighted images of a 49-year-old woman with SLE and JA (a) in flexion and (b) extension. In flexion, the extensor digitorum (ED) tendons of the 3rd and 4th fingers are completely displaced on the ulnar aspect of the metacarpal heads (white arrows) with no tendon visible on the dorsal aspect (arrowheads). In extension, the ED tendons of the 3rd and 4th fingers are slightly displaced on the ulnar side of the dorsal aspect of the metacarpal heads (black arrows).

Figure 2. Axial spin echo T1-weighted images of the sex- and age-matched control subject of the patient from Figure 1 (a) in flexion and (b) extension. The extensor digitorum tendons of the 3rd and 4th fingers are normally positioned on the dorsal aspect of the metacarpal heads in flexion (white arrows) and extension (black arrows).

Disclosure of Interests: Thomas Kirchgesner: None declared, Maria Stoenoiu: None declared, Nicolas Michoux: None declared, Xavier Libouton: None declared, Frederic Houssiau Grant/research support from: UCB, Consultant of: GSK, Bruno Vande Berg: None declared

DOI: 10.1136/annrheumdis-2020-eular.586

FRI0176 NON-HISTOLOGIC FACTORS DISCRIMINATING PROLIFERATIVE LUPUS NEPHRITIS FROM MEMBRANOUS LUPUS NEPHRITIS

Q. C. Kwon¹, J. H. Park¹, M. C. Park¹. ¹Yonsei University College of Medicine, Division of Rheumatology, Department of Internal Medicine, Seoul, Korea, Rep. of (South Korea)

Background: The treatment strategy and renal prognosis between proliferative lupus nephritis (LN) and membranous LN are different. Therefore, it is important to distinguish one from the other. To date, data regarding non-histologic factors that can discriminate proliferative LN from membranous LN are limited.

Objectives: To investigate non-histologic factors that can discriminate proliferative LN from membranous LN in patients with systemic lupus erythematosus with renal manifestations.

Methods: Patients with biopsy-proven proliferative LN and membranous LN were included. Non-histologic factors were compared between the two groups. A logistic regression analysis was performed to identify the factors associated with proliferative LN. To assess the accuracy of these factors in discriminating

between proliferative LN and membranous LN, we performed a receiver-operating characteristic analysis.

Results: Of the total 168 patients with biopsy-proven LN, 150 patients (89.3%) had proliferative LN, and 18 patients (10.7%) had membranous LN. In the multivariable logistic regression analysis, positive anti-double-stranded DNA (anti-dsDNA) antibody (adjusted OR = 11.200, 95% CI = 2.202–56.957, $p = 0.004$) was associated with proliferative LN, while positive anti-U1RNP antibody (adjusted OR = 0.176, 95% CI = 0.040–0.769, $p = 0.021$) and higher glomerular filtration rate (GFR) (adjusted OR = 0.973, 95% CI = 0.951–0.994, $p = 0.013$) were inversely associated with proliferative LN. Among these covariates, the anti-dsDNA antibody (area under the curve = 0.806, 95% CI = 0.695–0.916) had the highest accuracy in discriminating between proliferative LN and membranous LN.

Conclusion: The positivity of anti-dsDNA antibody was associated with proliferative LN, while the positivity of anti-U1RNP antibody and GFR were inversely associated with proliferative LN. The anti-dsDNA antibody had a good accuracy in discriminating proliferative LN from membranous LN.

References: Not applicable

Table. Factors associated with proliferative LN

	Univariable analysis		Multivariable analysis	
	OR (95% CI)	p	OR (95% CI)	p
Age	0.982 (0.951–1.014)	0.269		
Female sex	1.437 (0.295–7.006)	0.653		
Positive anti-Sm Ab	0.648 (0.243–1.728)	0.386		
Positive anti-Ro Ab	0.928 (0.341–2.529)	0.885		
Positive anti-La Ab	2.075 (0.572–7.528)	0.267		
Positive anti-U1RNP Ab ^a	0.271 (0.085–0.861)	0.027	0.176 (0.040–0.769)	0.021
Positive anti-dsDNA Ab ^a	7.333 (2.574–20.893)	<0.001	11.200 (2.202–56.957)	0.004
Low C3 ^a	9.970 (3.117–31.891)	<0.001	1.886 (0.255–13.932)	0.534
Low C4 ^a	3.839 (1.405–10.486)	0.009	1.224 (0.229–6.552)	0.813
GFR	0.980 (0.964–0.997)	0.021	0.973 (0.951–0.994)	0.013
Urine PCR	1.000 (0.987–1.013)	0.986		
Urine RBC of ≥ 5 /HPF	4.178 (1.516–11.509)	0.006	2.053 (0.426–9.893)	0.370
Urine WBC of ≥ 5 /HPF	2.687 (0.958–7.543)	0.060		
Urine cast	4.429 (0.567–34.578)	0.156		
SLEDAI-2K	1.173 (1.063–1.294)	0.001	1.046 (0.900–1.216)	0.557

Variables with P value less than 0.05 in the univariable analysis were selected for inclusion in the multivariable analysis.

^aAnalyzed as binary variables (Anti-U1RNP Ab, positive/negative; Anti-dsDNA Ab, positive/negative; C3, low/not low; C4, low/not low)

Ab, antibody; anti-dsDNA, anti-double-stranded DNA; GFR, glomerular filtration rate; PCR, protein/creatinine ratio; RBC, red blood cell; HPF, high power field; WBC, white blood cell; SLEDAI-2K, Systemic Lupus Erythematosus Disease Activity Index 2000; OR, odds ratio; CI, confidence interval

Acknowledgments: None.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.4056

FRI0177 MULTI-MODALITY IMAGING TO EVALUATE LUPUS NEPHRITIS

C. Dykas¹, B. H. Rovin², M. Boesen³, O. Kubassova⁴, P. Lipsky¹. ¹AMPEL BioSolutions, Charlottesville, United States of America; ²The Ohio State University, Columbus, United States of America; ³University of Copenhagen, Copenhagen, Denmark; ⁴Image Analysis Group, London, United Kingdom

Background: Lupus nephritis (LN) remains a significant cause of morbidity and mortality in subjects with Systemic Lupus Erythematosus (SLE). The gold standard for evaluation of LN remains the kidney biopsy, whereas renal function is usually evaluated by eGFR and urinary protein:creatinine ratio. More effective and sensitive methodology is needed to assess LN and also the response to treatment. Functional imaging of the kidney using quantitative techniques has great potential, as it can assess kidney function and pathologic changes non-invasively by evaluating perfusion, oxygenation, cellular density and fibrosis.

Objectives: The objective of this study was to develop a multi-modality imaging approach for the evaluation of the spectrum of pathologic changes in LN and to determine when imaging data correlated with renal function

Methods: In this multi-center study (NCT03180021), subjects who were having a standard of care renal biopsy for LN were asked to participate in the imaging evaluation. Local Institutional Review Board approval was obtained, and subjects signed an Informed Consent Form. Dynamic contrast enhanced MRI (DCE-MRI) was employed to detect changes in vascularization and perfusion, Diffusion Weighted Imaging (DWI) to assess interstitial diffusion, T2*Map/BOLD to evaluate tissue oxygenation and T1rho to evaluate fibrosis (Figure 1). Regions of interest were identified in the imaged kidneys and imaging parameters were correlated with measures of renal function, including eGFR and urinary