criteria of the European Working Group on Sarcopenia in Older People (3) using appendicular lean mass assessed by bioelectric impedance analysis and grip strength - stratifying both by body mass index. We also used the 2016 formula by Scafoglieri et.al to calculate appendicular lean mass (4). This approach is different from previous studies because we combined the new formula with established cut-off values, which incorporate a functional parameter. Muscle function was assessed by hand grip, knee extension strength and peak expiratory flow. Impairment and quality of life were evaluated using the Scleroderma Health Assessment Questionnaire (SHAQ) and Short-Form 36 Health Survey (SF-36®). Clinical data were assessed according to standardised procedures.

Results: The prevalence of sarcopenia in our study group was 27.1%. There were no significant differences between patients with and without sarcopenia regarding age ($p=0.838$) and disease duration ($p=0.832$). There were significant differences regarding grip strength ($p<0.001$), knee extension strength ($p=0.003$), peak flow ($p=0.042$), SF-36® Physical Function ($p=0.009$) and the number of immunosuppressive ($p=0.048$) and other drugs taken ($p=0.037$). See Table 1.

Table 1 Comparing analysis between two patient groups (Sarcopenia/ No Sarcopenia)

Variable	Sarcopenia, n = 35	No Sarcopenia, n = 94	p
Women	32 (91.4)	85 (90.4)	0.862
Age (years)	59.5 ± 14.8	59.0 ± 13.5	0.838
Disease duration (years)	8.6 ± 6.0	8.9 ± 6.9	0.832
Body Mass Index (kg/m ²)	20.6 ± 2.7	25.5 ± 5.2	< 0.001
Hand grip strength (kgF)	10.3 ± 6.1	18.7 ± 8.0	< 0.001
Knee extension strength (kgF)	13.6 ± 7.2	22.3 ± 16.3	0.003
Peak flow (l/min)	305.8 ± 102.0	348.3 ± 101.9	0.042
SF-36® Physical Health SUM	40.5 ± 18.1	48.5 ± 19.6	0.043
SF-36® Physical Function	41.7 ± 27.1	54.3 ± 27.4	0.026
SHAQ score	0.66 ± 0.12	0.64 ± 0.07	0.010
IPAQ (level of activity – high)	5 (14.3)	28 (29.8)	0.073
Number of medication	6.2 ± 3.8	4.8 ± 3.2	0.037
Number of immunosuppressive medication	1.4 ± 1.1	1.0 ± 1.0	0.048

Data are given in mean ± SD or n (%)

SSc – Systemic Sclerosis; SF-36® – Short Form 36; SHAQ – Scleroderma Health Assessment Questionnaire; IPAQ – International Physical Activity Questionnaire; CRP – C-reactive protein

Conclusions: There is a high prevalence of sarcopenia in patients with SSc even among younger patients. Sarcopenic patients have a significant increase in physical impairment and a decreased quality of life regarding their physical health. Taking a higher number of immunosuppressive or other drugs was identified as a risk factor for sarcopenia. This could be due to severe organ involvement being a confounder or an indication for the immunological component in the pathophysiology of secondary sarcopenia. This suggests that sarcopenia might be linked to severe disease or multimorbidity in SSc patients.

References:

- [1] Wang C, Bai L. Sarcopenia in the elderly: basic and clinical issues. *Geriatrics & gerontology international*. 2012 Jul;12(3):388–96.
- [2] Dogan SC, Hizmetli S, Hayta E et.al. Sarcopenia in women with rheumatoid arthritis. *European journal of rheumatology*. 2015 Jun;2(2):57–61.
- [3] Cruz-Jentoft AJ, Baeyens JP, Bauer JM et.al. Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People. Age and ageing. 2010 Jul;39(4):412–23.
- [4] Scafoglieri A, Clarys JP, Bauer JM et.al. Predicting appendicular lean and fat mass with bioelectrical impedance analysis in older adults with physical function decline - The PROVIDE study. *Clinical nutrition (Edinburgh, Scotland)*. 2016 Apr 28.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.5532

SAT0334 CORRELATING MULTIPLEX PLASMA CYTOKINE ANALYSIS WITH RIGHT HEART CATHETERISATION FINDINGS IN SCLERODERMA ASSOCIATED PULMONARY ARTERIAL HYPERTENSION

C.H. Ho¹, S. Nihtyanova², B. Ahmed Abdi², G. Coglan³, C. Denton², B. Schreiber⁴, V.H. Ong². ¹Department of Medicine, Queen Elizabeth Hospital, Kowloon, Hong Kong; ²Centre for Rheumatology and Connective Tissue Diseases, University College London Medical School, Royal Free Hospital; ³Department of Cardiology; ⁴Department of Rheumatology, Royal Free Hospital, London, United Kingdom

Background: Right heart catheterisation (RHC) is an important test for the

diagnosis and subclassification of pulmonary hypertension (PH), one of the serious manifestations of systemic sclerosis (SSc). It provides haemodynamic information for diagnosis and management. Routine RHC in SSc cases with suspected PH permits blood sampling to explore plasma levels of key cytokines that may be markers of mediators of pulmonary arterial hypertension (PAH) pathogenesis.

Objectives: This is an exploratory study to assess for associations between plasma cytokine levels and haemodynamic assessment from RHC in SSc patients.

Methods: SSc patients undergoing routine RHC were recruited. Indications for referral included suspected PH, or those on treatment for established PH for assessment of response to therapy. Blood samples were collected during RHC in consented patients. Demographic and clinical data were obtained. Haemodynamic data from RHC including mean right atrial pressure (mRAP), mean pulmonary arterial pressure (mPAP), pulmonary capillary wedge pressure (PCWP), pulmonary vascular resistance (PVR), cardiac output (CO) and cardiac index (CI) were recorded. Plasma samples were analysed using a bead-based multiplex platform for IL1b, IL4, IL6, IL10, IL17A, IL17F, IL21, IL22, IL23, IL25, IL31, IL33, IFNγ, sCD40L and TNFα (Bio-Rad Pro Assays). Plasma from a small group of healthy controls were also analysed for comparison. For analytes found to be below the lower limit of detection of the assays, they were assumed to be equal to the lower limit of the detection as per the assay's protocol.

Results: 32 SSc patients were recruited. Their mean age was 59.4-year-old, and 31 of them (97%) were female. Most (n=29, 91%) had limited cutaneous SSc. The commonest antibody was anti-centromere antibody (n=16, 55%), followed by anti-U3RNP antibody (n=4, 14%). None of these patients had significant pulmonary fibrosis (≥20% involvement on HRCT thorax scan). PAH, defined as mPAP ≥25mmHg & PCWP ≤15mmHg, was diagnosed at RHC in 26 patients (81%).

Among the proteins tested, only the level of sCD40L was significantly different among the three groups, namely SSc with PH, SSc without PH and healthy controls ($p=0.008$). sCD40L was also the only biomarker which was significant higher among patients with SSc (with and without PH) than healthy controls ($p=0.0284$).

Interestingly, there was a weak negative correlation between sCD40L and mPAP (correlation coefficient=-0.35, $p=0.0486$). There was a moderately strong positive correlation between mRAP and IL4 (correlation coefficient=0.57, $p=0.0006$) and IL10 (correlation coefficient=0.51, $p=0.0028$). We found no evidence for association between any of the biomarkers and cardiac output, cardiac index, PCWP or PVR.

Conclusions: Our data suggest that some individual plasma proteins may correlate with specific RHC haemodynamic parameters. Future studies will extend these findings and explore whether combining multiple analytes may give stronger non-invasive prediction of relevant haemodynamic variables and could be used in detection or monitoring of PAH in SSc.

References:

- [1] *Proc Natl Acad Sci USA*. 2015 May19;122(20):E2677–86.
- [2] *Ann Am Thorac Soc*. 2016 Jan;13(1)25–30.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.5798

SAT0335 SERUM KYNURENINE/TRYPHTOPHAN (KYN/TRP) RATIO AND NEOPTERIN (NEO) LEVELS ARE RAISED IN SYSTEMIC SCLEROSIS (SSC) AND ASSOCIATE WITH SPECIFIC CLINICAL AND AETIO-PATHOGENETIC FEATURES

C. Campochiaro¹, S.D. Lytton², B. Ahmed Abdi¹, V.H. Ong¹, C.P. Denton¹.

¹Centre for Rheumatology and Connective Tissue Diseases, Royal Free Hospital and UCL Division of Medicine, London, United Kingdom; ²SeraDialLogistics Benediktenwandstr 7, 81545, München, Germany

Background: The enzymes IDO degrades Trp into Kyn and is induced by IFN-γ/IL-1. Neo is produced by monocytes/macrophages after IFN-γ stimulation through the enzyme GTPCH and is a biomarker for immune activation in several diseases [1]. The activity of GTPCH is induced in parallel to IDO and the Kyn/Trp ratio has been suggested to be a direct measure of IDO activity [2].

Objectives: To assess serum level of Kyn, Trp, Neo and Kyn/Trp ratio in SSc and potential associations with specific disease features.

Methods: 60 SSc pts and 10 healthy controls (HC) were recruited and serum levels of Kyn, Trp and Neo were measured. Kyn/Trp ratio was calculated. The results were then correlated with specific disease features: disease duration, limited or diffuse disease, autoantibody profile (anti-RNA pol III (ARA), anti-topoisomerase (ATA) and anti-centromere (ACA)), inflammatory markers, Hb level, concurrent modified Rodnan skin score (mRSS), peak mRSS, pulmonary fibrosis (PF), pulmonary arterial hypertension (PAH), history of scleroderma renal crisis (SRC), GI involvement, vasculopathy, environmental exposure, oncology history, smoking status, immunosuppressive treatment, NT-proBNP and urate levels. Non-parametric statistical tests were used.

Results: Kyn/Trp ratio was higher in SSc compared to HC (mean 49.97±32.77 [41.50 – 58.43] vs 22.5±6.3 [13.5 – 32.5] μmol/mmol, $p<0.05$) and, more specifically, dcSSc showed higher ratio compared to lcSSc that had higher ratio than HC (mean 56.58±39.62 [43.18 – 69.99] vs 40.05±13.93 [34.16 – 45.93] vs 22.5±6.3 [17.99 – 27.01] μmol/mmol respectively, $p<0.05$). Moreover,

ARA+SSc had a significantly higher ratio compared to ATA+ and ACA+pts (mean 61.24±41.40 [45.78 – 76.70] vs 39.62±17.99 [29.66 – 49.58] and 37.77±10.20 [32.12 – 43.42] $\mu\text{mol}/\text{mmol}$ respectively, $p<0.05$). Kyn/Trp ratio was significantly correlated with SRC ($p<0.05$). We found a direct correlation with mRSS ($r=0.269$, $p<0.05$), peak mRSS ($r=0.276$), urate level ($r=0.376$), CRP ($r=0.285$) and ESR ($r=0.320$). Conversely, Neo levels, although significantly higher in SSc compared to HC (mean 12.63±9.30 [10.21 – 15.06] vs 7.11±3.31 [4.74 – 9.48] nmol/L, $p<0.05$), were not significantly different in diffuse compared to limited SSc, but were higher in ARA+ compared to ACA+ and ATA+ patients (mean 14.93±11.52 [10.54 – 19.31] vs 10.81±4.95 [8.07 – 13.56] vs 10.02±6.83 [6.24 – 13.80] respectively, $p<0.05$). Neo levels significantly correlated with PAH. A direct correlation ($p=0.05$) was found with CRP ($r=0.471$) and ESR ($r=0.430$).

Conclusions: These data suggest that Kyn/Trp ratio and Neo levels may reflect aetio-pathogenetic mechanisms in SSc and be elevated in the subgroup of dcSSc that are ARA+, or those manifesting SSc complications associated with ARA+. A specific IFN-gamma signature could be thought to be responsible for the higher levels found in patients although larger studies are required.

References:

- [1] Ozkan Y et al. Correlation between DAS-28 and neopterin in early rheumatoid arthritis. *Clin Rheum*. 2012.
- [2] Krcmova KJ et al. Fast and sensitive HPLC method for the determination of neopterin, kynurenine and tryptophan in amniotic fluid, malignant effusions and wound exudates. *Bioanalysis*. 2015.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.3786

SAT0336 MALNUTRITION AND SARCOPENIA IN A LARGE COHORT OF PATIENTS WITH SYSTEMIC SCLEROSIS

C. Caimmi¹, P. Caramaschi¹, A. Venturini¹, E. Bertoldo¹, M. Ferrari², M. Rossini¹. ¹Rheumatology Unit; ²Internal Medicine, University of Verona, Verona, Italy

Background: Systemic sclerosis (SSc) is an autoimmune disease that may affect gastrointestinal tract, leading to malabsorption and malnutrition. Previous studies defined this complication with no widely accepted criteria. No thorough evaluations of sarcopenia are available.

Methods: 141 SSc consecutive outpatients have been enrolled. A thorough history, blood samples and body composition by densitometry were collected. Malnutrition was defined accordingly to recently published and widely accepted ESPEN criteria (1); sarcopenia was diagnosed in patients with a reduced skeletal muscle index (2).

Results: The table summarizes cohort's characteristics. Malnutrition was diagnosed in 9.2% (CI95%: 4.4–14.0%). Malnourished patients were more often treated with steroids ($p=0.039$), had worse gastrointestinal symptoms accordingly to UCLA questionnaire ($p=0.007$), lower physical activity accordingly to International physical activity questionnaire ($p=0.028$), longer disease duration ($p=0.019$), worse predicted DLCO/VA and FVC ($p=0.009$, respectively) and worse disease severity accordingly to Medsger severity score (DSS) ($p<0.001$ for total, $p=0.001$ for lung and $p<0.001$ for gastrointestinal tract). In multivariate analysis only FVC ($p=0.006$) and disease severity ($p=0.003$), in particular lung involvement as defined by DSS ($p=0.013$), were confirmed to be worse in malnourished patients. Z-scores were significantly lower in malnourished patients at lumbar site $p=0.033$, even after correcting for possible confounders. Sarcopenia was diagnosed in 20.7% (CI95% 14.0–27.4%); 11/29 sarcopenic patients were also malnourished and 6/29 were cachectic (i.e. sarcopenia + systemic inflammation). Sarcopenic patients had worse DLCO/VA ($p=0.003$) and lung ($p=0.005$) involvement accordingly to DSS than non-sarcopenic ones; cachectic had even lower value ($p=0.016$ for both). Sarcopenic patients had also longer disease duration ($p=0.033$).

Table 1. Patients' characteristics

Age	63 (13)
Sex (female) [§]	119 (84.4)
Diffuse disease subset [§]	44 (31.2)
Disease duration (year)	13.3 (7.2)
Interstitial lung disease [§]	39 (27.7)
Pulmonary arterial hypertension [§]	12 (8.5)
Active disease accordingly to Valentini [§]	27 (19.1)
FVC predicted (%)	103 (23)
DLCO/VA predicted (%)	75 (21)
mRSS*	8 (7)
Medsger severity score*	5 (3)
Erythrocyte sedimentation rate (mm/h)	26 (16)
C-reactive protein (mg/l)*	3 (0)
Endothelin receptor antagonists [§]	16 (11.3)
Prostanoids (any) [§]	130 (92.2)
Steroids [§]	23 (16.3)
Immunosuppressive treatment [§]	35 (24.8)

*Expressed as media (IQR); [§]Expressed as absolute value (%).

Conclusions: Malnutrition defined with widely accepted diagnostic criteria was found to be lower than previously reported (3–7) using screening tool or non-validated criteria. Sarcopenia was found to be somewhat common, although no previous study on comparable cohorts are available. Lung involvement and

function was shown to be significantly linked with nutritional status and may not be explained only by muscle weakness given the absence of correlation between muscle weakness and FVC but only with DLCO/VA.

References:

- [1] Cederholm et al. *Clinical Nutrition* 2015;34:335.
- [2] Baumgartner et al. *Am J Epidemiol* 1998; 147:755.
- [3] Baron et al. *J Rheumatol* 2009;36:2737.
- [4] Krause et al. *Ann Rheum Dis* 2010;69:1951.
- [5] Murtaugh et al. *Clin Nutr* 2013;32:130.
- [6] Caporali et al. *Clin Nutr* 2012;31:666.
- [7] Rosato et al. *Nutrition* 2014;30:204.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.3420

SAT0337 IMPACT OF ORGAN INVOLVEMENT ON PATIENT-REPORTED OUTCOMES IN PATIENTS WITH IDIOPATHIC INFLAMMATORY MYOPATHIES

D. Huscher¹, K. Albrecht¹, J. Richter², J. Henes³, T. Alexander⁴, A. Zink^{1,4}. ¹Epidemiology, German Rheumatism Research Centre, Berlin; ²Polyclinic & Hiller Research Unit for Rheumatology, Medical Faculty, Heinrich-Heine-University Duesseldorf, University Clinic, Duesseldorf; ³Department of Rheumatology and Clinical Immunology, Eberhard Karls-University of Tuebingen, Tuebingen; ⁴Department of Rheumatology and Clinical Immunology, Charité University Hospital, Berlin, Germany

Background: Idiopathic inflammatory myopathies (IIM) are associated with considerable morbidity, primarily related to severe muscle weakness and visceral involvement, resulting in disability and impaired quality of life¹. Results from the OMERACT Myositis Special Interest Group indicate that there is insufficient knowledge on patient-reported outcomes (PROs) in IIM².

Objectives: To analyse the association between organ involvement and PROs in IIM patients, taking the presence of autoantibodies into account.

Methods: Data of IIM patients, recorded in the National Database of the German collaborative arthritis centres between 2007 and 2014, were analysed. Physician-reported data on myositis disease phenotypes, organ involvement and antibody status were linked with PROs on functional status (FFbH, range 0–100, 100 indicating full capability), and numerical rating scales (0–10) for pain, fatigue, general health, physical and emotional well-being and coping. Multivariable linear regression analysis was used to investigate the impact of phenotype, organ involvement and autoantibodies on PROs, adjusted for sex, age and disease duration.

Results: A total of 142 IIM patients - 60 polymyositis (PM), 46 dermatomyositis (DM), 15 antisynthetase syndrome (ASS), 12 overlap (OL), 9 others - with mean disease duration of 7.4 years were included. 85% showed muscular, 36% skin involvement, 22% arthritis, 28% interstitial lung disease, 17% dysphagia and 9% cardiomyopathy. Visceral (lung, cardiac or gastrointestinal) manifestation was present in 46% (PM), 54% (DM), 100% (ASS), and 80% (overlap). While moderate to severe (4–10) fatigue was predominately reported in overlap (64%) and ASS (70%), pain was more frequent in overlap (55%) and emotional discomfort was reported most frequently in ASS (57%). For all PROs, worse outcomes were documented in patients with visceral manifestation. Myositis-specific autoantibodies, predominantly Anti-Jo1, were present in 63% of the patients, and were associated with more frequent visceral manifestation (73% vs. 46%), especially interstitial lung disease (50% vs. 15%), and arthritis (32% vs. 13%), but less skin involvement (26% vs. 49%). DM and PM subtypes showed almost identical coefficients for fatigue, physical well-being, general health and coping, while PM was associated with higher emotional strain. Pulmonary hypertension had a severe impact on pain, functional status and daily activities. Cardiomyopathy was associated with impaired general health, arthritis with poorer scores for coping, physical and emotional well-being.

Conclusions: IIM patients with distinct subtypes differ considerably regarding the frequency of organ involvement and self-reported dimensions of disease burden. Anti-Jo1 positivity is associated with higher visceral organ involvement and arthritic manifestations and may therefore also indicate a higher patient-reported disease burden.

References:

- [1] Marie I. *Curr Rheumatol Rep* 2012;14:275–85.
- [2] Regardt M et al. Report from OMERACT 12. *J Rheumatol*. 2015;42:2492–5.

Acknowledgements: The database is funded by unconditional grants from the German Collaborative Arthritis Centres and from a consortium of 11 pharmaceutical companies to the German Academy for Continuing Medical Education in Rheumatology.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.3822

SAT0338 SURVIVAL IN A TURKISH INFLAMMATORY MYOSITIS COHORT: A SINGLE-CENTRE STUDY

E. Er Gülbezer, F. Yargucu Zihni, G. Karabulut, G. Keser, Y. Kabasakal. *Rheumatology, Ege University Medical Faculty Internal Medicine, Izmir, Turkey*

Background: Inflammatory myositis is an uncommon group of diseases that