sleep disorders as predictors of fatigue. In SLE patients, fatigued patients had lower quality of life than those who were non-fatigued.

Conclusions: This is the first known evaluation of the contributors of fatigue and the effects of fatigue on SLE patients' quality of life in China. The majority of Chinese SLE patients suffer from fatigue, which significantly impairs their quality of life. The results emphasise the need for holistic assessment and targeted intervention/management of SLE patients to relieve the symptoms of fatigue and finally improve their quality of life.

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THU0383 PERFORMANCE OF MUSCULOSKELETAL INVOLVEMENT OF SYSTEMIC LUPUS ERYTHEMATOSIS: AN ULTRASOUND STUDY IN 114 PATIENTS

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Background: Joints are commonly involved in systemic lupus erythematosus (SLE). Ultrasound (US) has been widely used in rheumatoid arthritis (RA), however rarely applied and studied in SLE.

Objectives: To investigate the ultrasonic changes of the symptomatic joints and their correlations with clinical manifestations in SLE patients.

Methods: 114 SLE patients who complained of arthralgia or arthritis from May 2014 to Aug 2017 and 15 Rhupus patients due to overlapping with RA were recruited for ultrasound evaluation. Ultrasound scan of the symptomatic joint areas was completed. The correlation between ultrasonographic changes and clinical characteristics was analysed. Besides that, US changes of bilateral wrists and hands of Rhupus patients were compared with those of the SLE patients.

Results: In a total of 1866 joints scanned, synovial hyperplasia, tenosynovitis, erosion and osteophytes were all observed. Synovial hyperplasia was more often observed in knees in 28.6% patients (12/42), ankles in 25% patients (7/28), wrists in 23.3% patients (23/69) and elbows in 20% patients (5/25). Tenosynovitis and erosion were most commonly found in shoulders in 35% (7/20) and 65% (13/20) patients. Osteophytes were more common in proximal interphalangeal (PIP) joints, elbows and knees. Among 69 patients with 22 joints (bilateral wrists and hands) scanned, synovial hyperplasia was observed in 25 patients (36.2%) and erosion in 22 patients (31.8%). The agreement between synovial hyperplasia and swollen joints in PIP was fair ($\kappa=0.633$, $p<0.01$), however poor in wrists ($\kappa=0.089$, $p=0.584$). 18.4% patients with synovial hyperplasia had no tenderness or swollen clinically, while 15.7% patients with tenderness or swollen had no synovial hyperplasia on ultrasound. No correlation was found between ultrasound changes with SLE disease activity index. Both synovial hyperplasia and erosion were more common in Rhupus patients (73.3% vs. 36.2%, $p=0.08$; 66.7% vs. 26.0%, $p=0.03$) with significantly higher GS score (7.4 ± 6.4 vs. 1.6 ± 4.1 , $p=0.04$) than SLE alone patients.

Conclusions: Variety of changes can be observed by ultrasound at different joints in SLE patients. The ultrasonographic changes and clinical manifestations did not always correspond to each other. Synovial hyperplasia and erosion was more common in Rhupus patients.

Disclosure of Interest: None declared

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THU0384 SALIVARY GLAND ULTRASONOGRAPHY AND STIMULATED SALIVARY FLOW CORRELATED WITH SALIVARY GLAND BIOPSY AMONG PATIENTS WITH SJÖGREN SYNDROME AND SICCA SYMPTOMS: EXPERIENCE FROM A SINGLE MEDICAL CENTRE IN TAIWAN

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Background: Sjögren's syndrome is an autoimmune disease that involves several organs. In the latest classification criteria, salivary minor gland is one of the major factor contributing to the diagnosis. Ultrasonography is a non-invasive, easy accessible tool in evaluation the contour and structure of salivary glands, which have been shown to have efficacy in monitoring the disease status of Sjögren's syndrome as well as in diagnosis the disease. Otherwise, salivary flow rate is another component of classification criteria, and its association with disease activity remains to be elucidated.

Objectives: To investigate the efficacy of salivary gland ultrasonography and salivary flow rate in patients with Sjögren's syndrome and Sicca symptoms.

Methods: Total 97 patients of primary or secondary Sjögren's syndrome, and patients with sicca symptoms were enrolled. Ultrasonography was performed at parotid and submandibular glands with 13–16MHz linear probe. Each gland was scored from 0 to 4. Minor salivary gland biopsy results were examined by pathologist with Chisholm-Mason grade. Unstimulated salivary flow rate was recorded first, and stimulated salivary flow rate was tested after 5 min of sugar-free chewing gum stimulation. Patients' symptoms were recorded by ESSPRI questionnaires.

Results: Total 56 primary Sjögren's Syndrome, 10 secondary Sjögren's Syndrome, and 31 patients with sicca symptoms were enrolled. Significant correlations were noted between unstimulated salivary flow rate and minor gland biopsy ($p=0.029$), stimulated salivary flow rate and biopsy ($p=0.006$), salivary gland ultrasonography and minor gland biopsy ($p<0.001$), and minor gland biopsy with serum anti-SSB (La) level ($p=0.009$). The correlations between minor gland biopsy and serum anti-SSA (Ro) level was not significant. The stimulated salivary flow rate also correlated with self-reported dryness in ESSPRI questionnaires ($p=0.018$). The salivary gland ultrasonography also correlated with ESSPRI ($p<0.001$) and the three factors in ESSPRI (dryness, $p<0.001$; pain, $p=0.039$; fatigue, $p=0.002$).

Conclusions: Both salivary gland ultrasonography and salivary flow rate correlated with the severity of salivary minor gland biopsy. The stimulated salivary flow rate had better correlations with the biopsy result than unstimulated flow, and it also correlated with patients' self-reported dryness symptoms. Salivary gland ultrasonography had correlations with symptoms of patient. These non-invasive methods may play roles in evaluation of the disease activity.

Disclosure of Interest: None declared

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THU0385 URINARY INFLAMMATORY CELLS REFLECT HISTOPATHOLOGICAL KIDNEY INJURY IN PATIENTS WITH LUPUS NEPHRITIS

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Background: Lupus nephritis (LN) is one of the common manifestations of systemic lupus erythematosus (SLE), and is considered to be a very important factor influencing the course of the disease. Although kidney biopsy is the gold standard for defining the histopathologic class of LN, it is an invasive procedure sometimes associated with a risk of bleeding and thrombotic events; furthermore, repeated biopsies are not always applicable in clinical practice. We have already reported that, in patients with glomerulonephritis, inflammatory cells such as T cells and macrophages appear in the urine when there are accompanying signs of active cellular infiltration such as cellular crescent formation and diffuse interstitial cell infiltration, but not when active inflammatory lesions are absent.

Objectives: To assess the utility of urinary inflammatory cell analysis in patients with LN by examining the correlations between the numbers of urinary inflammatory cells and renal histopathological findings.

Methods: Twenty-six patients with SLE, who had been referred to Niigata University Hospital between 2004 and 2017 and diagnosed as having LN by percutaneous kidney biopsy, were recruited for this study. Flow-cytometric analysis of urinary inflammatory cells was performed for each subject at the time of admission for kidney biopsy. Numbers of urinary T cells or macrophages were determined by multiplying the number of viable cells in the gated mononuclear cell region in each sample by the percentage of urinary CD3-positive or CD14-positive cells in the population, respectively. The histopathological findings of kidney biopsy specimens for each subject were classified according to the 2003 International Society of Nephrology/Renal Pathology Society (ISN/RPS) classification of LN. In addition, they were also evaluated for glomerular and interstitial lesions such as mesangial cell/matrix proliferation, endocapillary hypercellularity, crescent formation, and interstitial cell infiltration and fibrosis. The severity of each lesion was scored from 0 to 4, and the numbers of urinary inflammatory cells were analysed by Spearman's rank correlation coefficient to determine the relationships among these scores. Next, the patients were divided into two groups according to whether the total number of urinary inflammatory cells was significantly increased (more than 120 cells/ml; positive group, n=12) or not (negative group, n=14), and the severities of the histopathological lesions were compared between the two groups.

Results: Disease severity in terms of the ISN/RPS classifications was positively correlated with the severity of mesangial cell and matrix proliferation, cellular crescent formation, and duplication of the glomerular basement membrane. In addition to these four factors, the numbers of CD3-positive and CD14-positive cells were also positively correlated with adhesion, endocapillary hypercellularity, interstitial inflammatory cell infiltration, and interstitial fibrosis. The severity scores for adhesion, endocapillary hypercellularity, cellular and fibrous crescent formation, duplication, and interstitial cell infiltration were significantly higher in the positive group than in the negative group.

Conclusions: Analysis of urinary immune cells reflects the histopathological features of kidney biopsy specimens from patients with LN.

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THU0386

DIFFERENCE OF IMAGE FEATURES ON COMPUTED TOMOGRAPHY BETWEEN LUPUS ENTERITIS AND MESENTERIC VASCULITIS OF OTHER CONNECTIVE TISSUE DISEASES

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Background: Lupus enteritis(LE), lupus mesenteric vasculitis, occurs occasionally in systemic lupus erythematosus(SLE). Not only LE but also other mesenteric vasculitis can lead to bowel haemorrhage or perforation and will be fatal, but it is difficult to demonstrate histologically-proven vasculitis on endoscopic biopsy.¹ Although several computed tomography (CT) features of LE are reported, we have little knowledge about whether they differ from those of other mesenteric vasculitis.

Objectives: To clarify the imaging pattern on CT which can distinguish LE from other mesenteric vasculitis.

Methods: Patients diagnosed with LE and non-LE at our hospital were consecutively registered from January 2009 to August 2017. The diagnosis of LE was made by the criteria of ^{BILAG 2004} which is defined as either vasculitis or inflammation of small or large bowel with supportive imaging and/or biopsy findings.² Non-LE was defined as mesenteric vasculitis of other connective tissue diseases(CTDs). We compared the contrast-enhanced CT patterns of LE with non-LE. Statistical analyses were performed using XLSTAT.

Results: A total of 8 patients were diagnosed with LE and enrolled in this study. The mean age was 41.1 years old, range 23–53, and 7 were females. CT exams of all 8 patients demonstrated small bowel wall thickening, dilatation of intestine and comb sign (indicating engorgement of mesenteric vessels). Severe bowel wall thickening (>8 mm) was observed in 87.5% (n=7), ascites in 75.0% (n=6) and target sign (indicating abnormal bowel wall enhancement) in 62.5% (n=5). 5 patients were enrolled in non-LE (1 eosinophilic granulomatosis with polyangiitis, 1 IgA vasculitis and 3 Behcet's disease). Comparison of CT findings between LE patients and non-LE patients were summarised on table 1. Bowel wall thickness and comb sign were common in both groups, however the prevalence of dilatation of intestine in LE patients was significantly higher than in non-LE patients. Although not significant, complication of large bowel involvement was shown only in LE patients.

Abstract THU0386 – Table 1

	LE(n=8)	non-LE*(n=5)	p-value
Thickening bowel wall	100%	100%	—
Large bowel involvement	50.0%	0%	0.10
Asymmetrical patterns of involvement	12.5%	60.0%	0.21
Dilatation of intestine	100%	20.0%	0.0070
Ascites	75.0%	40.0%	0.29
Target sign	62.5%	40.0%	0.59
Comb sign	100%	100%	—

*non-LE : 1 Eosinophilic granulomatosis with polyangiitis, 1 IgA-vasculitis, 3 Behcet's disease

*non-LE : 1 Eosinophilic granulomatosis with polyangiitis, 1 IgA-vasculitis, 3 Behcet's disease

Conclusions: Dilatation of intestine on CT is significant to distinguish LE from mesenteric vasculitis of other CTDs.

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THURSDAY, 14 JUNE 2018:

Scleroderma, myositis and related syndromes_____

THU0387

HIGH-THROUGHPUT QUANTITATIVE HISTOLOGY IN SYSTEMIC SCLEROSIS SKIN DISEASE USING COMPUTER VISION

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Background: There are no validated systems to quantify dermal architecture of skin biopsy sections in systemic sclerosis (SSc). Significant advances in computer vision, called deep neural networks (DNNs), have demonstrated human-level pattern recognition abilities using mathematical transformations of images into millions of quantitative features.¹ Publicly available DNN algorithms have the potential to radically augment current histological analyses via robust, reproducible, and high-throughput image quantification.

Objectives: Apply publicly available DNN algorithms to trichrome-stained sections of dermal biopsies from patients with SSc to identify quantitative features of images that correlate with clinical skin fibrosis assessment via the validated modified Rodnan skin score (mRSS) and skin gene expression.²

Methods: One rheumatologist performed local mRSS (lmRSS) assessments (0–3) and two dermal punch biopsies for 7 patients with SSc and one healthy control at baseline and 6, 12, 24, and 36 months. One biopsy was paraffin embedded, sectioned, stained with trichrome, and photomicrographed. Images were transformed into high-level quantitative features using AlexNet and the Matlab Neural Network Toolbox.³ Correlations between quantitative features and lmRSS were determined with Bonferroni-Holm correction. One biopsy underwent gene expression profiling by DNA microarray. The degree of correlation between each gene and lmRSS was assessed and a functional gene network was determined using the GIANT database.⁴

Results: We identified 90 quantitative features that correlated significantly with local skin score (p<0.05, Bonferroni-Holm correction). Using these features, biopsies sorted into three clusters corresponding to low (mean=0.13), intermediate (mean=0.91), and high (mean=1.7) lmRSS. Gene expression for 488 genes in the biopsies correlated significantly with quantitative features (p<0.05, Bonferroni-Holm correction). Among these 488 genes, 185 genes formed a large functional network in the GIANT database including genes associated with the cell cycle, apoptosis, IL12 signalling, and wound healing such as CD44, THBS1, CAV1, and VEGFA.