Methods Urine samples were collected from active LN patients prior to induction treatment for LN and serially afterwards, coinciding with clinical visits. Luminex Bead Multiplex Assay was used for the analyses of urine biomarkers included in the RAIL score (neutrophil gelatinase-associated lipocalin, ceruloplasmin, monocyte chemoattractant protein-1, adiponectin, hemopexin, kidney injury molecule-1). RAIL scores were calculated per the defined algorithm for each urine sample. Data collected include LN histologic classification (International Society of Nephrology (ISN)/Renal Pathology Society (RPS) classification), renal SLE disease activity index (rSLEDAI) score and type of therapy.

Results At the time of the analysis, data from 6 active LN patients were collected longitudinally. Patients were all females and all had class IV LN per the ISN/RPS. Renal SLEDAI scores were on the higher end (M=11.3, SD=3.9). All patients were started on intravenous methylprednisolone and cyclophosphamide (CYC) therapy. All but one patient completed 6 doses of monthly CYC before switching to oral mycophenolate mofetil therapy. The RAIL scores for the 6 patients ranged between 1.8 and 3.29. All patients had reductions in their RAIL score at 2–3 months period at an average of 322% decline from baseline (Figure 1). At the end of induction treatment or at the 5–6 months interval, 5/6 samples were available for analysis and showed that 4/5 patients maintained a decline of RAIL scores below the baseline. Of note the patient with higher RAIL score at the end of treatment had only 3 monthly doses of CYC. All rSLEDAI scores decreased between baseline and the 6 months interval. However, one patient with known medication non-adherence had a flare of LN at the 6 months point leading to increased rSLEDAI.

Conclusions RAIL scores show overall improvement from baseline with LN induction therapy. Lack of improvement was associated with flare of disease. Additional data points and a larger study sample are required to study the ability of the RAIL score to reflect clinical improvement of LN.

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cerebral artery at base-line and after 30 s of breath holding. A breath-hold-index (BHI) of <0.69 indicates impaired cerebrovascular reserve capacity.

**Results** IMT in the aortic arch was higher in patents versus controls, 1.3±0.3 vs 1.1±0.2 mm (p=0.04), whereas no difference was found in the common carotid artery, 0.61±0.13 vs 0.55±0.10 mm (p=0.2). BHI-values were lower in the SLE-group, 1.29±0.36 vs 1.65±0.56 (p=0.05), whereas both groups had signs of preserved cerebrovascular reserve capacity. Mean oxygen saturation peak was decreased in SLE patients versus controls, 79.5±7.8% vs 86.9±5.6% (p=0.006). Endothelial function using EndoPAT did not differ, 0.72±0.40 vs 0.84±0.24, (p=0.3).

**Conclusions** This study indicates that microcirculatory vessel disease, as measured with EPOS and breath-hold index, could be present in SLE cases with atherosclerotic findings. However, the impaired microcirculation in SLE compared to population controls needs further validation in larger patient groups, also including non-atherosclerotic cases with SLE.

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**DYNAMIC DIFFUSE OPTICAL SPECTROSCOPY CAN DIAGNOSE AND QUANTIFY LUPUS ARTHRITIS**

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**Background** SLE arthritis is difficult to evaluate because of the sometimes-evanescent nature of the symptoms and limitations of physical exams and imaging studies. Dynamic diffuse optical spectroscopy (dDOS) can be used to assess changes in light absorption through tissues during transient venous occlusion. The optical signal reflects changes in blood perfusion and has diagnostic value in rheumatoid arthritis. The current study explored the use of dDOS in SLE arthritis.

**Methods** 12 SLE patients (ACR criteria) with active arthritis and 5 controls were evaluated. A dDOS sensor module was developed (figure 1a). Hemodynamic effects were obtained by inflating a BP cuff to 40 mmHg 60 s. Light at 3 wavelengths (λ=530, 655, 940 nm) was used to illuminate joints at 8 different points. Transmitted light intensities were measured with Si-photodetectors at 8 other positions (total 8×8=64=192 signal traces). Swollen, tender and healthy joints were examined by the same assessor.

**Results** SLE patients and normal controls dDOS data were available for analysis from 66 and 24 proximal interphalangeal (PIP) joints, respectively (PIPs 2–4). Best results were obtained at 530 nm with cuff inflation at 40 mmHg. A representative measurement of 3 SLE arthritis and 3 normal joints is shown in figure 1b, highlighting differences in rise and plateau time. Given the pronounced effects at λ=530 nm, we speculate that altered vessel physiology paired with already-increased blood pooling in the affected inflamed joints resulted in quicker increase in light absorption (rise time) that is maintained longer (plateau time) compared to normal joints. The AUC for dDOS was consistent with excellent discrimination, AUC=0.8639, sensitivity=76.19, specificity=88.57 (figure 1c).

**Conclusions** dDOS can evaluate SLE arthritis with high sensitivity and specificity. Rise and plateau time of the optical traces correlate strongly with swollen and tender joint count. The advantages of dDOS are non-invasiveness, objectivity...