(DMARDs) was higher among patients with moderate or high STR. Lupus nephritis was more common in patients with low STR. A higher proportion of patients with moderate STR had osteoarthritis. The proportion of patients with anxiety and depression decreased with increasing STR. On average, patient and physician global assessments from MDHAQ were higher for patients with moderate STR.

Table 1. Clinical characteristics of patients with SLE by swollen:tender joint count ratio group

	Low STR <0.5 (N=7,970)	Moderate 0.5 ≤ STR ≤ 1.0 (N=1,211)	High STR >1.0 (N=738)
Treatment prior to STR, n (%)			
Antimalarial	5,106 (64.1%)	702 (58.0%)	427 (57.9%)
Biologics (belimumab or rituximab)	662 (8.3%)	113 (9.3%)	70 (9.5%)
Immunosuppressants	2,310 (29.0%)	398 (32.9%)	252 (34.1%)
Select DMARDs	635 (8.0%)	165 (13.6%)	94 (12.7%)
Steroids	4,437 (55.7%)	785 (64.8%)	434 (58.8%)
Disease conditions prior to STR, n (%)			
Anxiety	266 (3.3%)	25 (2.1%)	12 (1.6%)
Depression	1,127 (14.1%)	149 (12.3%)	80 (10.8%)
Lupus nephritis	984 (12.3%)	117 (9.7%)	72 (9.8%)
Osteoarthritis	2,336 (29.3%)	393 (32.5%)	193 (26.2%)
Osteoporosis	631 (7.9%)	95 (7.8%)	47 (6.4%)
MDHAQ, N	1,991	388	230
MDHAQ, mean (SD)			
Patient global assessment (0-10)	4.5 (2.9)	5.3 (2.7)	4.4 (2.8)
Physician global assessment (0-10)	2.8 (2.7)	3.8 (2.6)	2.8 (2.3)

Conclusion: Differences in treatments received were apparent between patients of varying disease activity groups with trends towards increased use among patients with higher disease activity. Additional research is needed to determine the utility of this measure for assessing SLE-related outcomes.

References:

- [1] Cipriano et al., *Reumatismo* 2015 Sept 16;67(2):62-7
- [2] Hammer HB et al., *Arthritis Rheumatol* 2016; 68 (suppl 10)
- [3] Fanouriakis et al., *Ann Rheum Dis*. 2019;78:736-745

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FRI0187 IMMUNOGENICITY OF 23-VALENT POLYSACCHARIDE PNEUMOCOCCAL VACCINE IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS: EFFECT OF BIOLOGIC THERAPY ON THE VACCINAL RESPONSE

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Background: Vaccination with 23-valent polysaccharide pneumococcal vaccine (PPV-23) in systemic lupus erythematosus (SLE) provides the prevention of severe respiratory infections in patients receiving immunosuppressive therapy. The importance of this vaccination significantly increases before and during treatment with biologics.

Objectives: The aim of the study was to evaluate the immunogenicity of PPV-23 in SLE patients.

Methods: The study included 52 patients with SLE, including 44 women and 8 men, aged 19 to 68 years. The duration of the disease varied from 9 months to 39 years. At the time of vaccination 7 patients had high, 10 – moderate, 30 – low activity of the disease according to SLEDAI 2K, and 5 had remission. 50 patients received glucocorticoids (GC) 5-30 mg/day equivalent to prednisone, 39 – hydroxychloroquine (GCH), 29 – cytostatics (CS), 20 – biologics: 10 – rituximab (RTM), 10 – belimumab (BLM). 1 dose (0.5 ml) of PPV23 was administered subcutaneously. During the visits, standard clinical and laboratory tests were performed, and the level of antibodies (Ab) to *S.pneumoniae* in blood serum was determined (VaccZymeTMPCLg 2 kits – The Binding Site Ltd, Birmingham, UK).

Results: In 1-2 months after the vaccination 78.7% of patients had a significant (more than 2 times compared to baseline) increase in the concentration of Ab to the pneumococcal cell wall polysaccharides. A year after vaccination, 61.5% of patients ("responders") had a significant increase in the concentration of anti-pneumococcal Ab. 20 (38.5%) of 52 patients were considered "non-responders". Median concentration of anti-pneumococcal Ab was 67[42.6; 105.8] mg/l at visit 1 (initially), 405[143.5; 468.4] mg/l at visit 2 (in 1-2 months), 166.9[77.5; 377.4] mg/l at visit 3 (in 12 months).

There were clear differences in the degree of the vaccinal response depending on the therapy: in 20 patients receiving biologics full vaccinal response was achieved significantly less frequently than in patients who did not receive these

drugs (40% and 75%, respectively), $p=0.02$. There were no obvious differences in the vaccinal response during treatment with RTM and BLM (40% of responders in both groups). The vaccinal response significantly decreased during treatment with biologics in combination with GC +/- GCH (50% of responders). The lowest vaccinal response was observed in patients receiving biologics in combination with GC and CS +/- GCH (33.3% of responders).

The analysis of the degree of the vaccinal response depending on the timing of vaccination and the time of biologics infusion was carried out. In the first group ($n=6$), vaccination was carried out at the optimal time in accordance with the recommendations of EULAR (2020). In the second group ($n=14$) vaccination was carried out in suboptimal time: during regular treatment with BLM ($n=6$), 1 week before the next introduction of RTM ($n=2$), 3-5 months after the last introduction of RTM (5), 1 week before the next introduction of RTM ($n=1$), 20 days after the BLM termination ($n=1$). In the first group with optimal vaccination terms, the number of responders was 66.7%, in the second group with suboptimal terms – 28.6%, $p=0.27$.

Conclusion: Sufficient immunogenicity of PPV-23 was shown in SLE patients receiving immunosuppressive therapy. The negative impact of biologics on the vaccinal response was confirmed, especially if the vaccination was not performed at the optimal time in relation to the infusion of the drug or during monthly administration of BLM. If optimal vaccination terms are maintained during the treatment with or initiation of biologics (6 months after the last administration of RTM and 1 month before the next (or first) administration of RTM, 4 months after the last and 1 month before the next (or first) administration of BLM), the number of responders increases significantly. The lowest vaccinal response was obtained in patients receiving combined immunosuppressive therapy with biologics + GC+CS.

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FRI0188

THE CLINICOPATHOLOGICAL SIGNIFICANCE OF MODIFIED NATIONAL INSTITUTES OF HEALTH ACTIVITY AND CHRONICITY SCORING SYSTEM IN LUPUS NEPHRITIS; A MULTICENTER RETROSPECTIVE STUDY

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Background: The revised International Society of Nephrology/Renal Pathology Society (ISN/RPS) Classification of lupus nephritis (LN) 2018 defined a modified National Institutes of Health activity and chronicity scoring system for all LN classes [1]. As this was not arrived at by an evidence-based approach, its clinicopathological significance including prognostic value should be validated [1]. Furthermore, though the activity index included wire-loop lesion and hyaline deposits (WL), we previously demonstrated that WL was associated with serological immune abnormality, but not renal prognosis [2].

Objectives: We conducted this study to clarify the relationships of modified activity score (AS) and chronicity score (CS) to clinical parameters at the time of renal biopsy and renal and life prognoses, and also to investigate the impact of AS without WL.

Methods: We enrolled 138 Japanese LN patients subjected to renal biopsy in 11 hospitals from 2000 to 2019. We measured clinical findings at the time of renal biopsy, and determined the presence of comorbidities. We also measured serum creatinine and estimated glomerular filtration rate (eGFR) at the last patient visit, and recorded medications prescribed for LN. Renal biopsy findings were classified by the modified ISN/RPS classification 2018 including AS and CS for all LN classes. On stepwise multivariate analysis, we applied the variables with significant differences in univariate comparisons. The primary endpoint was chronic kidney disease (CKD; eGFR <60 ml/min/1.73m²) and/or death.

Results: Of 138 patients (116 females; median 39 years old), class I, II, III, IV, and V included 2 (1.4%), 13 (9.4%), 43 (31.2%), 69 (50.0%), and 11 (8.0%), respectively. Median AS, AS without WL (AS-WL), and CS were 4, 3, and 2, respectively. AS ≥5 group (61 patients, 44.2%) had higher proteinuria, hematuria and serum anti-ds DNA antibodies levels and lower serum total protein (TP) and C3 levels than AS <5 group. CS ≥3 group (58 patients, 42%) had higher age, proteinuria, serum C3 levels, and frequency of hypertension (HT) and lower eGFR and serum anti-ds DNA antibodies and IgG levels than CS <3 group. Multiple regression analysis revealed significant associations between AS and hematuria, TP and C3 ($\beta=0.312, -0.281, -0.213; p<0.001, 0.001, 0.009$), and between CS and age ($\beta=0.300; p=0.010$). Next, patients who achieved the primary endpoint had higher age, frequencies of HT and hyperlipidemia and lower eGFR, serum TP and IgG levels than patients who did not. Observation period (median 36 vs 47 months, $p=0.696$) and medications for LN did not differ between these groups. Cox regression analysis revealed significant associations of prognosis

with eGFR and TP clinically ($\beta=0.955$, 3.349; $p=0.025$, 0.008), and with CS pathologically ($\beta=1.231$, $p=0.028$). Neither AS nor AS-WL was included in the prognostic factors. Kaplan-Meier method with log-rank tests showed a significant difference in cumulative rate of CKD and/or death between CS ≥ 3 and CS < 3 groups ($p=0.049$).

Conclusion: AS and CS were related to different clinical parameters at the time of renal biopsy. CS was associated with renal and life prognoses, while neither AS nor AS-WL was. These results revealed that these scores have different clinicopathological significance in LN.

References:

- [1] Bajema IM, et al. *Kidney Int.* 2018;93:789-96.
- [2] Zoshima T, et al. *Lupus* 2019, accepted.

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FRIDAY, 05 JUNE 2020

Vasculitis

FRI0189

ENDOTHELIAL PROTEIN C RECEPTOR AND SCAVENGER RECEPTOR CLASS B TYPE 1 NEGATIVELY REGULATE ENDOTHELIAL ACTIVATION AND REPRESENT NOVEL AUTOANTIGENS IN TAKAYASU ARTERITIS

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Background: Takayasu arteritis (TAK) is a chronic granulomatous vasculitis and affects large vessels in young female. It has been recognized that high numbers of patients with TAK possessed autoantibodies against vascular endothelium, which are called anti-endothelial cell antibodies (AECAs). Although their target antigens had not been identified for a long time, we utilized an expression cloning system for specific identification of cell-surface antigens and successfully identified endothelial protein C receptor (EPCR) and scavenger receptor class B type 1 (SR-BI) as major novel autoantigens in TAK. It was possible that identified novel autoantibodies were utilized for clinical application and elucidating pathomechanisms of TAK.

Objectives: To reveal the clinical impact and pathogenic potential of novel autoantibodies in TAK

Methods: Three hundred twenty-five patients with autoimmune diseases were enrolled: 80, TAK; 10, giant cell arteritis (GCA); and 235, other autoimmune diseases. The expressions of EPCR and SR-BI were examined in the aortic tissue from several diseases by immunohistochemistry. The presence of novel autoantibodies was measured in TAK and other autoimmune diseases. Clinical characteristics of patients with these autoantibodies were evaluated in TAK. To investigate the pathogenetic potential of these novel autoantibodies, vascular endothelial cells from umbilical vein, aortic artery, and pulmonary artery were examined for the endothelial cell activation. The effects of the novel autoantibodies upon the differentiation of immune cells were also evaluated.

Results: In non-inflammatory aortic tissue, the expressions of EPCR and SR-BI were observed in the endothelium of vasa vasorum. Their expressions in the endothelium were augmented in TAK tissue. Novel autoantibodies against EPCR or SR-BI were detected in 34.6 % or 36.5 % of cases, respectively in TAK, and overlap was observed only in two cases, indicating their exclusive nature. These autoantibodies were specific for TAK among autoimmune rheumatic diseases, and they were not detected in patients with GCA with cranial involvement, suggesting different pathomechanisms among these diseases. The clinical characteristics of patients with anti-EPCR autoantibodies included high prevalence of stroke and ulcerative colitis. Surprisingly, anti-EPCR autoantibodies were also detected in patients with primary ulcerative colitis, suggesting their common pathomechanisms with TAK. Serial measurement of these novel autoantibodies revealed their correlation with disease activity of TAK. In mechanistic studies, EPCR and SR-BI functioned as negative regulators of endothelial activation and chemokine production. EPCR further functioned in human T cells and ameliorated Th17 differentiation. Autoantibodies against EPCR and SR-BI blocked the functions of their targets, thereby promoting pro-inflammatory phenotype.

Conclusion: EPCR and SR-BI are preferentially expressed in the endothelium of vasa vasorum and upregulated in TAK tissue. Autoantibodies against EPCR or SR-BI are specific for TAK among autoimmune rheumatic conditions and detected in about 70 % of TAK, suggesting their usefulness for the diagnosis, subclassification, and monitoring of TAK. Autoantibodies inhibit the resolution of activated immune responses and thus would lead to the chronic vascular inflammation.

References:

- [1] Shirai T et al. *Arthritis Res Ther* 2012;14:R157.
- [2] Shirai T et al. *Clin Dev Immunol* 2013;2013:453058.
- [3] Shirai T et al. *J Neuroinflammation*. 2013;10:128

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FRI0190

COMPARATIVE EFFICACY AND SAFETY OF MYCOPHENOLATE MOFETIL VERSUS CYCLOPHOSPHAMIDE IN PATIENTS WITH ACTIVE ANTINEUTROPHIL CYTOPLASMIC ANTIBODY-ASSOCIATED VASCULITIS: A META-ANALYSIS OF RANDOMIZED TRIALS

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Background: Cyclophosphamide (CYC) is effective for induction of remission of AAV, resulting in complete remission rates of around 70%. Thus, CYC has been the standard remission induction therapy for antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV); however, it is toxic and causes infections, malignancies, and infertility. Therefore, other agents that are less toxic but that have similar efficacy were explored. Since the disease course of AAV usually requires long-term immunosuppression, mycophenolate mofetil (MMF), a less toxic agent compared to CYC, has been explored as an alternative to CYC.

Objectives: The aim of this study is to assess the efficacy and safety of MMF versus cyclophosphamide CYC in patients with active AAV.

Methods: We performed a meta-analysis of four randomized clinical trials (RCTs) (300 patients) to examine the relative efficacy and safety of MMF compared to CYC in patients with active AAV.

Results: There was no significant difference in remission at 6 months between MMF and CYC (OR 1.311, 95% confidence interval [CI] 0.570 – 3.017, $P = 0.524$). Additionally, the relapse rate did not differ between the MMF group and CYC group (OR 1.331, 95% CI 0.497 – 3.568, $P = 0.570$). There was no significant difference in serious adverse event (SAE) (OR 1.232, 95% CI 0.754 – 2.014, $P = 0.404$) and infection rate (OR 0.958, 95% CI 0.561 – 1.634, $P = 0.873$) between the MMF and CYC groups. Some heterogeneity was found in the meta-analysis of remission and relapse rate ($I^2 = 57.4\%$, 63.4%), but no between-study heterogeneity was found during the meta-analysis of the SAE and infection rate. Egger's regression test showed no evidence of publication bias (Egger's regression test P -values > 0.1).

Conclusion: MMF was an equally effective alternative treatment to CYC, and MMF was comparable to CYC in patients with active AAV in terms of safety, suggesting that MMF can be used as an alternative to CYC for remission induction in AAV.

References:

- [1] Han F, Liu G, Zhang X, Li X, He Q, He X, Li Q, Wang S, Wang H, Chen J (2011) Effects of mycophenolate mofetil combined with corticosteroids for induction therapy of microscopic polyangiitis. *Am J Nephrol* 33:185-192
- [2] Jones RB, Hiemstra TF, Ballarin J et al (2019) Mycophenolate mofetil versus cyclophosphamide for remission induction in ANCA-associated vasculitis: a randomised, non-inferiority trial. *Ann Rheum Dis* 78:399-405
- [3] Tuin J, Stassen PM, Bogdan DI, Broekroelofs J, van Paassen P, Cohen Tervaert JW, Sanders JS, Stegeman CA (2019) Mycophenolate Mofetil Versus Cyclophosphamide for the Induction of Remission in Non-life-Threatening Relapses of Antineutrophil Cytoplasmic Antibody-Associated Vasculitis: Randomized, Controlled Trial. *Clin J Am Soc Nephrol* 14:1021-1028
- [4] Hu W, Liu C, Xie H, Chen H, Liu Z, Li L (2008) Mycophenolate mofetil versus cyclophosphamide for inducing remission of ANCA vasculitis with moderate renal involvement. *Nephrol Dial Transplant* 23:1307-1312

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FRI0191

CRANIAL-LIMITED AND LARGE-VESSEL GIANT CELL ARTERITIS: PRESENTING FEATURES AND OUTCOME

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Background: Giant cell arteritis (GCA) comprises two main phenotypes: cranial (C) and large-vessel (LV) disease¹. A full baseline steroid-free vascular imaging evaluation is required to properly diagnose LV involvement²