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POS0255

IMPACT OF PLASMA EXCHANGE (PLEX) IN SEVERE ANCA-ASSOCIATED VASCULITIS (AAV): A REAL-LIFE DATA FROM A PROSPECTIVE COHORT

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Background: PEXIVAS was the largest clinical trial conducted on severe AAV patients and failed to demonstrate the contribution of PLEX on the prognosis of severe AAV. This data needs to be tested with real life experiences.
Objectives: The aim of this study was to explore the effects of PLEX on the prognosis of severe AAV in a real-life cohort.
Methods: Hacettepe University Vasculitis Research Center (HUVAC) prospective database was established in October 2014 by registering past and newly diagnosed patients. Baseline disease characteristics, treatments and survival status were recorded. For this study, patients with granulomatosis polyangiitis (GPA) and microscopic polyangiitis (MPA) who met the inclusion criteria of PEXIVAS trial [briefly; ANCA positive MPA or GPA patients with either severe renal involvement (necrotizing glomerulonephritis or active urinary sediment, and eGFR <50 ml/min) and/or severe pulmonary involvement (pulmonary hemorrhage due to active vasculitis)] at the disease onset were included. Patients were grouped whether they had PLEX or not. Demographic and disease-specific data and immunosuppressive agents used in induction phase were compared. Primary outcome was accepted as composite index of mortality or end-stage renal disease (ESRD) at the first year and at the final visit.
Results: Of 145 GPA and MPA patients, 49 patients had inclusion criteria and distribution of patients were as GPA (n=38), MPA (n=8) or renal-limited (n=3). 16 (32.6%) patients had PLEX. Median number of plasma exchange cycles was 6.5 (min-max; 2-12). Although severe pulmonary [10 (62.5%) vs. 5 (15.2%), p=0.001] and combined severe renal+pulmonary involvements were more prevalent [9 (56.3%) vs. 4 (12.1%), p=0.001] and baseline creatinine levels were higher in PLEX (+) group, BVAS and FFS scores were similar (Table 1). Induction immunosuppressive regimens were comparable.
At first year evaluation, primary composite outcome was observed in 11 patients (3 deceased, 8 ESRD) of PLEX (+) group whereas in 12 patients (2 deceased, 10 ESRD) of PLEX (-) group (p = 0.03, log-rank). In multivariate analysis: **combined renal+pulmonary involvements** (aOR: 6.5 [1.1-37.9]) and **serum creatinine** (for 1 mg/dl increment) (aOR: 1.3 [1.1-1.7]) were associated with primary outcome. In this model, having plasma exchange was not associated with a favorable outcome.
At the end of median follow-up [40.7 (1.2-170.3) months], outcome was observed in 12 patients (9 deceased, 3 ESRD) of PLEX (+) group and in 13 patients (6 deceased, 7 ESRD) of PLEX (-) group (p < 0.001, log-rank). In multivariate analysis: **having plasma exchange** (HR: 3.5 [1.4-8.5]) and **combined renal+pulmonary involvements** (HR: 2.4 [1.05-5.8]) were found as the predictors of primary composite outcome. In the figure 1, comparison of primary outcome according to FFS and plasma exchange status was given.
Conclusion: In real-life plasma exchange did not have a positive impact on the composite index of mortality and ESRD, similar to PEXIVAS trial. Presence of combined severe renal and pulmonary involvement was the predictor of worse outcome at 1-year and overall follow-up.

Table 1. Comparison of disease characteristics and composite indexes of patients

	PLEX (+) (n=16)	PLEX (-) (n=33)
GPA/MPA/Renal-limited (n)	12/3/1	26/5/2
Female, n(%)	8 (50.0)	13 (39.4)
Age at diagnosis, months (med,min-max)	54.5 (18.8-77.8)	55.6 (18.1-86.3)
MPO-ANCA / PR3-ANCA (n)	5 / 11	16 / 17
Follow-up duration, months (med, min-max)	16.6 (1.2-116.5)	50.5 (2.2-170.0)
BVAS at diagnosis, (med, min-max)	23 (14-37)	23 (8-33)
FFS ≥ 2 (n,%) (N=45)	23 (85.7)	26 (83.9)
Creatinine (mg/dl) at diagnosis† (med,min-max)	8.1 (4.1-8.9)	3.1 (1.8-6.2)
CRP (mg/dl) at diagnosis (med,min-max)	21.8 (15.0-29.0)	11.5 (3.6-20.0)
Immunosuppressive (induction) (n,%)		
-Pulse steroid	14 (87.5)	29 (87.9)
-Rituximab	1 (6.3)	3 (9.1)
-Cyclophosphamide	12 (75.0)	28 (84.8)

†p = 0.005

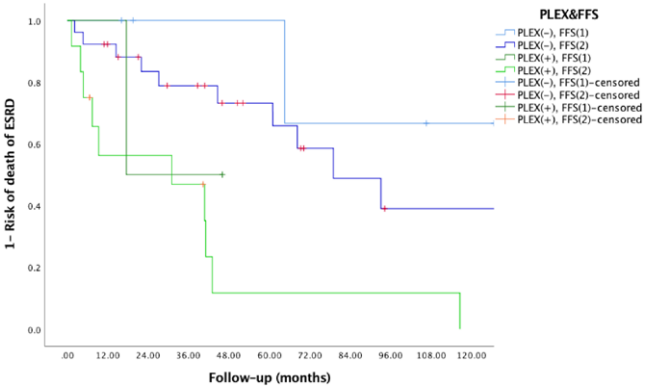

Figure 1. Comparison of primary outcome according to FFS and plasma exchange status

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Diagnostics and imaging procedures

POS0256

AUTOMATED CAPILLARY DETECTION AND IMAGE ANALYSIS SOFTWARE IN CAPILLAROSCOPY: CAPILLARY.IO

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Background: A nailfold capillaroscopy procedure is a non-invasive, low-cost, and well-established examination that can be used to diagnose several rheumatic autoimmune diseases and support the necessary follow-up of patients. There are two main elements to nailfold capillaroscopy: image acquisition and image interpretation. Both of these can present challenges: we need to ensure that the best possible images are captured, and we need to define the enlarged capillaries, capillary loss and pericapillary hemorrhages objectively. We introduce Capillary.io, an automatic image reading system able to recognize capillaries in images obtained with any microscope, generate automatic measurements of each capillary and take advantage of this information to report capillary morphology. Together it allows a comprehensive analysis that is capable of producing detailed reports for each patient.
Objectives: The primary outcome was general sensitivity and specificity, using images assessed by expert capillaroscopists as the gold standard.
Methods: 6500 images previously analyzed by capillaroscopists from GREC were compared with Capillary.io. Capillary morphology (enlarged capillaries, tortuosities, ramifications, megacapillaries, hemorrhages) of each of the capillaries contained in each of the images was analyzed manually by at least one expert capillaroscopist. Subsequently, the automatic image interpretation system was used to fully automatically analyze each of the capillaries contained in each image and the results obtained were compared.
Results: Overall, a total of 78.347 capillaries were compared, of which 47.734 were normal capillaries, 21.991 enlarged capillaries, 2672 megacapillaries, 8512 tortuosities, 1322 ramifications and 5149 hemorrhages. Capillary.io was able to detect 38.101 normal capillaries, 19.126 enlarged capillaries, 2389 megacapillaries, 5698 tortuosities, 718 ramifications and 3706 hemorraghes.

Capillary.io presented a sensitivity (S) of 79.82% and a specificity (E) of 82% in the recognition of normal capillaries. The automatized system was able to recognize enlarged capillaries with a sensitivity of 86.97% and a specificity of 81.38%. Megacapillaries were detected with 89.41% sensitivity and 78.75% specificity. Similarly, the system was able to detect tortuosities (S 66.94%; E 67.71%), ramifications (S 54.34%; E 58.61%) and hemorrhages (S 71.36; E 73.97%).

Conclusion: Capillary.io is a simple, easy-learning web-based system to get interpretation of nailfold capillaroscopic images. It may be a very useful tool to standardize the interpretation of capillaroscopic pictures and could provide great research in that field.

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POS0257 TOWARDS A SIMPLIFIED FLUID-SENSITIVE MRI-PROTOCOL IN SMALL JOINTS OF THE HAND IN EARLY ARTHRITIS PATIENTS: RELIABILITY BETWEEN MDIXON AND REGULAR FSE FAT SATURATION MRI-SEQUENCES

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Background: MRI facilitates early recognition of rheumatoid arthritis (RA) by depicting inflammation. Contrast-enhanced T1-weighted and T2-weighted fat-suppressed sequences have been sensitive and thus recommended, but are hampered by invasiveness, costs and long scan time. Therefore we introduced a modified Dixon-sequence (mDixon) which is more patient-friendly, reduces cost, and scan times by 83%. However, it is not known if this mDixon-sequence is reliable in relation to regular MRI-sequences with and without contrast (T1- and T2-weighted, respectively).

Objectives: We determined the reliability between regular MRI-sequences with and without contrast (T1- and T2-weighted, respectively) and mDixon-MRI in early arthritis patients.

Methods: 29 early arthritis patients underwent regular fat-suppressed-MRI (T1- and T2-weighted) and mDixon-sequences, of metacarpophalangeal-2-5 and wrist-joints. Two readers scored erosions, osteitis, synovitis and tenosynovitis. Intraclass correlation coefficients (ICCs) between readers, and comparing the two sequences, were studied. Spearman correlations were determined.

Results: Performance between the two readers with the regular-MRI sequences, was good to excellent (ICCs all ≥0.88). The between reader ICC was also good to excellent for the mDixon-MRI (ICCs all ≥0.76). Next, ICCs between the two sequences was investigated to determine the reliability of mDixon. ICCs were good to excellent for total RAMRIS score 0.87 (95%CI 0.74-0.94), for erosions 0.88 (95%CI 0.69-0.95), and total inflammation score 0.84 (95%CI 0.69-0.82). The individual MRI-inflammation scores, had ICCs for osteitis 0.97 (95%CI 0.93-0.98), for tenosynovitis 0.78 (95%CI 0.58-0.89), and for synovitis 0.57 (95%CI 0.26-0.77). In addition, scores were highly correlated for total RAMRIS, erosions, and total MRI-inflammation score (ρ=0.82, ρ=0.81, ρ=0.80, respectively).

Conclusion: Regular-MRI sequences and mDixon-MRI perform equally well, this suggests that mDixon-sequence is reliable to detect joint inflammation. Thus, this is the first step towards an simplified and abridged MRI-protocol in small hand-joints in early arthritis patients. The ultimate goal will be implementation of this mDixon-MRI sequence. Validation in larger studies is warranted.

Disclosure of Interests: None declared

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POS0258 REAL-TIME VERSUS STATIC SCORING IN MUSCULOSKELETAL ULTRASONOGRAPHY IN PATIENTS WITH INFLAMMATORY HAND OSTEOARTHRITIS

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Background: Ultrasound (US) is used in rheumatic musculoskeletal diseases (RMDs) such as hand osteoarthritis (OA) as outcome measure. Traditionally scoring is performed real-time, but central reading of static US images could avoid issues of inter-rater reliability. However, agreement between real-time and static assessment has not been studied

Objectives: To study the agreement between real-time and static scoring of US in inflammatory hand OA.

Methods: Ultrasound was performed of 30 joints obtained in 75 patients with hand osteoarthritis, treated with prednisolone or placebo in a randomized double-blind trial. Hand joints were assessed for synovial thickening, effusion, Doppler signal and osteophytes by ultrasound (score 0-3 per joint) at baseline and after treatment. Two ultrasonographers blinded for clinical data scored the live images together (simultaneously) in real-time. A consensus score for each joint was recorded. Representative images stored during scanning were scored by one ultrasonographer minimally 6 months after real-time scoring. For each patient, images of each visit were scored paired, with known chronological order. Agreement between scoring methods was studied at joint level with quadratic weighted kappa. At patient level, intra-class correlations (ICC; mixed effect model, absolute agreement, with clustering taken into account) were calculated at both timepoints. ICCs were also calculated for the delta of sum scores. Responsiveness of scoring methods was analyzed with generalized estimating equations (GEE) with treatment as independent and ultrasonography findings as dependent variable.

Results: Thirty-nine patients (52%) were treated with prednisolone and 36 (48%) were treated with placebo. Patient characteristics were well-balanced between treatment groups.

All patients had signs of synovial thickening and osteophytes as assessed by real-time ultrasonography, and almost all signs of effusion (99%) or a positive Doppler signal (95%) in at least one joint. Total ultrasonography sum score for osteophytes was high (mean 45 ±SD 12), whereas sum score was low for positive Doppler signal (mean 5.9 ±SD 4.4), with intermediate sum scores for synovial thickening and effusion (mean 16 ±SD 6.3 and 11 ±SD 6.0 respectively). Static sum scores were overall slightly higher (osteophytes mean 48 ±SD 10; Doppler mean 6.9 S±D 5.0; synovial thickening mean 20 ±SD 7.0 and effusion 13 ±SD 6.5)

Agreement at baseline was good to excellent at joint level (kappa 0.72-0.88) and moderate to excellent at patient level (ICC 0.59-0.86). Agreement for delta sum scores was poor to fair for synovial thickening and effusion (ICC 0.18 and 0.34 respectively), but excellent for Doppler signal (ICC 0.80) (Table 1).

Real-time ultrasonography showed responsiveness to prednisolone with a mean between-group difference of synovial thickening sum score of -2.5 (CI:-4.7 to-0.3). Static ultrasonography did not show a decrease in synovial thickening (Figure 1). No difference in ultrasonography scores was seen for the other ultrasonography features, neither with real-time nor static scoring.

Conclusion: While cross-sectional agreement between real-time and static ultrasonography was good, agreement of delta sum scores was not and paired static ultrasonography measurement of synovial thickening did not show responsiveness to prednisone therapy where real-time ultrasonography did. Therefore, when using ultrasonography in clinical trials, real-time dynamic scoring should remain the standard.