**Conclusion:** This study shows the high prevalence of echocardiographic alterations in PsA patients compared to the general population, of the same magnitude as patients with RA. We emphasize the value of an echocardiogram for a complete cardiovascular evaluation and early detection of cardiac abnormalities in these patients.

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## POS1393 QUANTITATIVE AUTOFLUORESCENCE FINDINGS IN PATIENTS UNDERGOING HYDROXYCHLOROQUINE TREATMENT

S. Parrulli[1], M. Cozzi[1], M. Airaldi[1], F. Romano[1], F. Viola[2], P. Sarzi-Puttini[3], G. Staurenghi[1], A. Invernizzi[1,4]. *[1]Sacco Hospital, University of Milan, Eye Clinic, Department of Biomedical and Clinical Science "Luigi Sacco", Milan, Italy*; *[2]University of Milan, IRCCS-Ca Granda Fondazione Ospedale Maggiore Policlinico, Ophthalmological Unit, Department of Clinical Sciences and Community Health, Milan, Italy*; *[3]ASST Fatebenefratelli L.Sacco University Hospital, Rheumatology Unit, Milan, Italy*; *[4]Sydney Medical School, The University of Sydney, Save Sight Institute, Discipline of Ophthalmology, Sydney, Australia*

**Background:** Hydroxychloroquine (HCQ) is a relatively safe and effective drug widely used as primary or adjunctive treatment for several rheumatological and dermatological disorders[1]. HCQ modulates immune response through several mechanisms and has a tropism for pigmented ocular tissues, particularly retinal pigment epithelium (RPE)[2]. Its accumulation within RPE cells can lead to sight threatening retinal toxicity, with bull's eye maculopathy (BEM) representing its advanced phenotype. [3] Quantitative Auto-Fluorescence (qAF) is an imaging modality that allows the measurement of retinal auto-fluorescence following short-wavelength light (488nm) excitation of retinal fluorophores (lipofuscin). [4] Two recent studies have focused on qAF values in patients treated with HCQ [5,6]. In both cases qAF was increased in eyes with BEM. Furthermore, Reichel et al.[6] were able to detect increased values of qAF in patients without BEM as early as 6 months after the start of HCQ treatment using an experimental imaging analysis procedure.

**Objectives:** To measure quantitative autofluorescence (qAF) in patients under treatment with hydroxychloroquine (HCQ) with no apparent signs of retinal toxicity and to compare it with that of untreated subjects.

**Methods:** Consecutive patients at risk for the development of HCQ retinal toxicity (duration of treatment >5 years or daily HCQ dose >5 mg/kg of actual body weight (ABW) and/or renal insufficiency)[7] but no alterations on Spectral Domain - Optical Coherence Tomography, Short-Wavelength Autofluorescence and 10-2 Visual Field examination were recruited. Healthy subject matched by age and sex were also enrolled in the study. All subjects underwent qAF measurements in one eye. Images were analyzed using the conventional qAF grid by Delori calculating the qAF of 8 sectors of the intermediate ring and the mean of those values ($qAF_8$).

**Results:** Thirty-nine patients treated with HCQ (38 females, mean age 52,1 ± 8,6 years) and 39 untreated subjects (38 females, mean age 51,2 ± 8,6 years). In both HCQ patients and untreated subjects, $qAF_8$ was positively correlated with age (p=0.004) (Figure 1). Although HCQ patients showed a higher mean $qAF_8$ compared to untreated subjects (294,7 ±65,3 vs 268,9 ± 57,5), the difference was not significant (p=0.068). HCQ patients showed significantly higher mean qAF values in the inferior-temporal, inferior and inferior-nasal sectors of the intermediate ring of qAF grid compared to untreated subjects (all p<0.05).

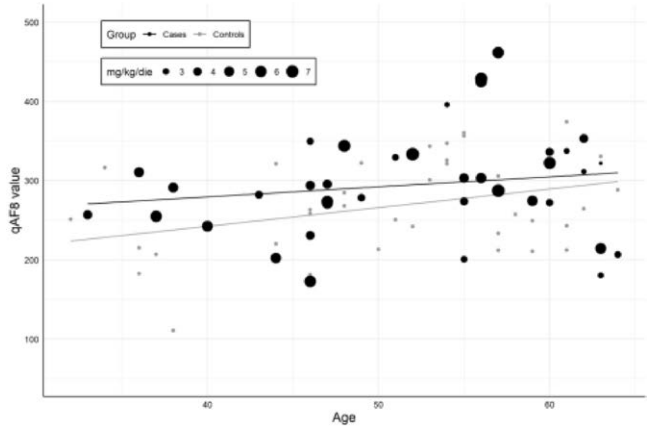


**Figure 1.** Visual representation of a model predicting the standardized qAF values as influenced by age and HCQ daily dose/ABW, calculated for a treatment duration of 15 years.

**Conclusion:** These results suggest a possible preclinical increase of qAF values in inferior parafoveal sectors probably induced by HCQ exposure. Further studies are required to improve our understanding of preclinical stages of HCQ retinopathy and the possible role of qAF in the HCQ toxicity screening.

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## POS1394 ACCURACY AND PERFORMANCE OF A HANDHELD ULTRASOUND DEVICE TO ASSESS ARTICULAR AND PERIARTICULAR PATHOLOGIES IN PATIENTS WITH INFLAMMATORY ARTHRITIS

G. Corte[1,2], S. Bayat[1,2], K. Tascilar[1,2], L. Valor[1,2], L. Schuster[1,2], J. Knitza[1,2], G. Schett[1,2], A. Kleyer[1,2], D. Simon[1,2]on behalf of https://www.medizin3.uk-erlangen.de/en/research/research-main-focus/digital-rheumatology-and-experimental-imaging/. *[1]Friedrich-Alexander-Universität (FAU) and Universitätsklinikum Erlangen, Internal Medicine 3, Rheumatology and Immunology, Erlangen, Germany*; *[2]Friedrich-Alexander University (FAU) Erlangen-Nürnberg and Universitätsklinikum Erlangen, Deutsches Zentrum Immuntherapie, Erlangen, Germany*

**Background:** Handheld ultrasound (HHUS) devices have increasingly found their way into clinical practice due to several advantages (e.g. portability, significantly lower purchase cost). However, there is no evidence to date on the accuracy and performance of HHUS in patients with inflammatory arthritis (IA).

**Objectives:** To assess accuracy and performance of a new HHUS machine in comparison to a conventional cart-based sonographic machine in patients with IA.

**Methods:** Consecutive IA patients of our outpatient clinic with at least one tender and swollen joint in the 66/68 joint count were enrolled. US was performed on clinically affected joints with corresponding tendons/entheses using a cart-based sonographic device ("Samsung HS40") and a HHUS device ("Butterfly iQ") in standard scan positions. One blinded reader scored all images for the presence of following pathologic findings: erosions, bony enlargement, synovial hyperthrophy, joint effusion, bursitis, tenosynovitis and enthesitis. In addition, synovitis was graded (B Mode and power Doppler (PD)) by the 4-level EULAR-OMERACT scale [1]. To avoid bias by the blinded reader, who otherwise would have been tempted to identify pathological findings for each examined joint, we also included 67 joints of two healthy volunteers into the evaluation. We calculated the overall concordance and the concordance by type of joint and type of pathological finding between the two devices (percentage of observation pairs in which the same rating was given by both devices). The Cohen's kappa coefficient (κ) with 95% bootstrap confidence intervals was used to assess the agreement between the two US devices. We also measured the time required for the US examination of one joint with both devices.

**Results:** 32 patients (20 rheumatoid arthritis, 10 psoriatic arthritis, 1 gouty arthritis, 1 systemic lupus erythematosus) were included in this study. Mean age of patients was 58.2±13.7 years, 63% were females. In total 186 joints were examined. The overall raw concordance in B-mode between the two devices was 97 %, with an overall κappa for agreement of 0.90, 95% CI (0.89, 0.94). No significant differences were found in relation to type of joint or pathological finding examined. The PD-mode of the HHUS device did not detect any PD-signal, whereas the cart-based device detected a PD-signal in 61 joints (33%). The portable device did not offer any time saving compared to the cart-based device (mean time in seconds per examined region: 47 seconds for the HHUS device versus 46.3 seconds for the cart-based device).

**Conclusion:** The HHUS device "Butterfly iQ" has been shown to be accurate in the assessment of structural joint damage and inflammation in patients with IA,

but only in B-mode. Significant improvements are still needed to reliable demonstrate blood flow detection by PD mode.

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**Table 1. Concordance between a handheld and a conventional cart-based US device in B-mode**

| | Agreement by site | | |
|---|---|---|---|
| | N joints (%) | Concordance (%) | Kappa 95%CI |
| Overall | 186 | 97 | 0.90 (0.89 to 0.94) |
| Wrist | 32 (17.2) | 96 | 0.86 (0.77 to 0.93) |
| Finger/toe joint (MCP, PIP, DIP, MTP) | 114 (61.3) | 97 | 0.92 (0.88 to 0.95) |
| Elbows | 11 (5.9) | 95 | 0.87 (0.75 to 0.97) |
| Shoulder | 4 (2.2) | 100 | 1.00 (NA to NA) * |
| Knee | 20 (10.7) | 98 | 0.96 (0.90 to 1.00) |
| Ankle | 5 (2.7) | 100 | 1.00 (NA to NA) * |
| Agreement by pathological finding | | | |
| Joint effusion | | 95 | 0.81 (0.68 to 0.92) |
| Synovitis | | 94 | 0.87 (0.79 to 0.93) |
| Synovitis OMERACT grade (0– 3) | | 90 | 0.84 (0.76 to 0.91) |
| Bone enlargement | | 98 | 0.88 (0.71 to 1.00) |
| Erosion | | 98 | 0.89 (0.77 to 0.89) |
| Tenosynovitis | | 98 | 0.83 (0.61 to 0.96) |
| Entheseopathy | | 100 | 1.00 (NA to NA) * |
| Bursitis | | 97 | 0.90 (0.89 to 0.94) |

** unreliable kappa statistics because of small number of shoulders/ankles examined and small number of entheseopathies*

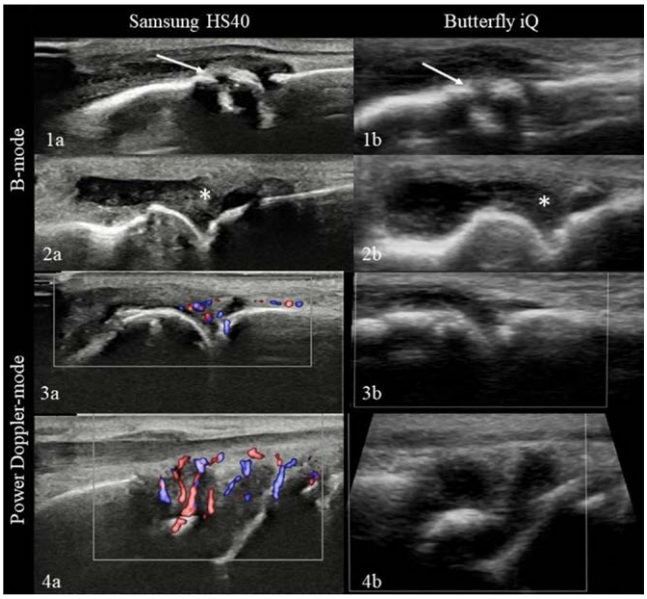


Figure 1. Pathological US findings in MCP joints (1, 2, 3) and wrist (4) depicted by the two different ultrasound devices

B-mode erosive (arrow) and synovial (asterisk) changes could be detected by both devices (1-2), while PD changes of different grades only by the conventional US device (3-4).

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POS1395

## ASSESSMENT OF MICROVASCULAR INVOLVEMENT IN LUPUS NEPHRITIS PATIENTS BY RETINAL OCT-ANGIOGRAPHY AND KIDNEY BIOPSIES

S. Ferrigno[1], P. Conigliaro[1], C. Giannini[2], C. Nesi[2], G. L. Fonti[1], M. Cesareo[2], R. Perricone[1]. [1]*University of Rome Tor Vergata, Rheumatology, Allergology and Clinical Immunology, Department of "Medicina dei Sistemi", Rome, Italy*; [2]*University of Rome Tor Vergata, Ophthalmology Unit, Department of Experimental Medicine and Surgery, Rome, Italy*

**Background:** Lupus Nephritis (LN) and retinopathy are organ-threatening manifestation of Systemic Lupus Erythematosus (SLE) and both share common pathophysiology represented by microvascular damage. Optical coherence tomography angiography (OCTA) is a recent non-invasive technique showing retinal vascular damage.

**Objectives:** To analyze retinal microvascular alterations in SLE-LN patients and investigate correlations between ocular and renal involvement.

**Methods:** We recruited SLE-LN patients and healthy controls (HC), age and sex -matched. Patients underwent rheumatological evaluation, including clinical, laboratory, kidney function and kidney biopsies examination.

Patients and HC underwent a complete ophthalmological evaluation including eye definition color retinography and OCTA whole image, parafovea and fovea vessel density assessment of superficial and deep retinal capillary plexus. Parafovea and fovea thickness, fovea avascular zone (FAZ) area and perimeter were detected.

Statistical analysis was performed using: $\chi 2$ test, unpaired t-test, Mann Whitney U test, Pearson or Spearman rank correlation and ROC curve analysis.

**Results:** 48 eyes of 24 SLE-LN patients and 44 eyes of 21 HC were evaluated. Table 1 shows demographic, clinical, laboratory and histological parameters.

Figure 1 shows results of OCTA data and relative AUC curves and ROC analysis. Analysis of OCTA data showed a significative reduction of vessel density in SLE-LN compared to HC regarding the following parameters: superficial whole en face, parafovea and fovea density (Figure 1A-C), deep whole en face and deep fovea density, (Figure 1D-E), parafovea and fovea thickness (Figure 1F-G), FAZ area and perimeter (Figure 1H-I).

OCTA data were correlated with demographic, clinical and histologic features of patients showing negative correlation between: SLE duration and both superficial (p=0.03; r=-0.3) and deep (p= 0.004; r=-0.4) whole en face density; LN duration and superficial whole en face (p=0,05; r=-0.4) and parafovea (p=0.007; r=-0.4) density, deep whole en face (p=0.004; r=-0.4) and fovea (p=0.01; r=-0.4) density and parafovea thickness (p=0.004; r=-0.3); SLEDAI-2K and both superficial and deep fovea density (p<0.0001, r=-0.6 and p=0.0, r=-0.4 respectively); BUN and superficial whole en face density (p=0.003; r=-0.5) and parafovea (p=0.004; r=-0.4) density and deep fovea density (p=0.03; r=-0.3); serum creatinine and deep whole en face density (p=0.004; r=-0.4).

Positive correlation was found between LN duration and FAZ area (p= 0.01; r= 0.4); creatinine clearance and both deep whole en face (p=0.05; r= 0.3) and fovea (p=0.0007; r= 0.5) density.

OCTA data analysis showed a reduction in superficial (p=0.02) and deep (p=0.009) whole en face density in patients with LN-vascular lesions assessed by kidney biopsy. In this group, patients with intimal hyalinosis showed a reduction in deep whole en face density (p=0.04) compared to those without intimal hyalinosis.

**Conclusion:** Preliminary results suggest a correlation between retinal microvascular alterations and kidney function and histologic lesions encouraging the use of OCTA measurement as a potential biomarker of systemic vascular involvement.

**Table 1.**

| | SLE | HC | P value |
|---|---|---|---|
| | N=24 | N=21 | |
| Age (years) | 44.4±13.8 | 38.3±10.4 | ns |
| Female (n/%) | 21/87.5 | 17/81 | ns |
| BCVA (logMAR) | 0.01± 0.05 | 0.0 ± 0.1 | ns |
| Disease duration (months) | 177.6± 126.6 | / | |
| LN duration (months) | 108 ± 97 | / | |
| SLEDAI-2K | 6.8±5 | / | |
| Creatininemia (mg/dl) | 0.9±0.3 | / | |
| BUN (mg/dl) | 39,6±17.6 | / | |
| Creatinine clearance (ml/min) | 99.2±53.7 | / | |
| Proteinuria (mg/24h) | 432.8±524.5 | / | |
| GMN class III-IV (n/%) | 19/77.7 | / | |
| GMN class III-V (n/%) | 5/22.2 | / | |
| Kidney biopsy active lesions (n/%) | 15/62.5 | / | |
| Kidney biopsy chronic lesions (n/%) | 15/62.5 | / | |
| Kidney biopsy vascular lesions (n/%) | 8/33.3 | / | |
| Kidney biopsy intimal hyalinosis (n/%) | 7/29 | / | |
| Moderate stage lupus retinopathy (n/%) | 20/83.3 | / | |
| Severe stage lupus retinopathy (n/%) | 3/12.5 | / | |

BCVA: best-corrected visual acuity, SLEDAI-2K: Systemic Lupus Erythematosus Disease Activity Index 2000, BUN: blood urea nitrogen; GMN: glomerulonephritis