1102 FISH OIL SUPPLEMENTATION AND PRO-INFLAMMATORY AND PRO-RESOLVING LIPID MEDIATORS IN PATIENTS WITH AND WITHOUT SYSTEMIC LUPUS ERYTHEMATOSUS

[1,2]May Y Choi, [3]Nancy R Cook, [1]Emma Stevens, [1]Jack Ellrodt, [3]Natalya Gomelskaya, [3]Gregory Kotler, [3]JoAnn E Manson, [4]Jessica Lasky-Su, [1]Raju Tatituri, [3]Samia Mora, [3,5]I-Min Lee, [6]Charles Serhan, [1]Karen H Costenbader*. *[1]Division of Rheumatology, Inflammation and Immunity, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA; [2]Division of Rheumatology, Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada; [3]Division of Preventive Medicine, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA; Division of Cardiovascular Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston, MA, USA; Center for Lipid Metabolomics, Brigham and Women's Hospital and Harvard Medical School, Boston, MA, USA; [4]Systems Genetics and Genomics Unit, Channing Division of Network Medicine Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts, USA; [5]Department of Epidemiology, Harvard T.H. Chan School of Public Health; [6]Department of Anesthesia, Perioperative and Pain Medicine, Center for Experimental Therapeutics and Reperfusion Injury, Brigham and Women's Hospital-Harvard Medical School, Boston, Massachusetts, USA*

10.1136/lupus-2021-lupus21century.45

Background Omega-3 fatty acid-derived 'specialized pro-resolving mediators' (SPM) are low-abundance lipid mediators (LM) central to inflammation resolution. We investigated whether fish oil (FO) supplementation was associated with pro-inflammatory and pro-resolving LM in patients with SLE compared to matched controls.

Methods Within the Mass General Brigham Biobank, we identified 16 patients with SLE taking FO, who were matched by age, sex, and race to 16 patients without SLE taking FO. Another 16 patients with SLE not taking FO were matched on the same factors to 16 non-SLE patients not taking FO. Demographic and clinical data were obtained by medical record review. Targeted liquid chromatography-tandem spectroscopy was performed on plasma to quantify 27 omega-3derived LM, identified with >6 diagnostic ions by tandem mass spectrometry (MS-MS). Multivariable linear analyses examined the associations of SLE, FO, and their interactions with LM levels (log-transformed to improve normality), adjusting for smoking status, body mass index and medications. In SLE case-only analyses, we additionally adjusted for C-reactive protein or erythrocyte sedimentation rate (normal/elevated), anti-double stranded DNA (dsDNA positive/negative), C3 and C4 (normal/low), and presence of lupus nephritis. We adjusted for multiple comparisons using a False Discovery Rate (FDR) with a cut-off of 0.05. For missing data, we used multiple imputation.

Results Among SLE patients, lower levels of arachidonic acid (AA) and most (60%) of its proinflammatory derivatives were observed in those taking vs. not taking FO, whereas, among the controls, higher levels of AA and all of its pro-inflammatory derivatives were observed in those taking vs. not taking FO (figure 1). However, after adjustment for multiple comparisons, there were no significant differences for any LM between SLE compared to matched controls, taking or not taking FO. Among controls, taking FO was associated with higher levels of eicosapentaenoic acid (adjusted β coefficient 0.67 (95% CI: 0.28-1.07), FDR = 0.04). Taking FO was not associated with SPM levels among SLE patients even after adjusting for markers of disease activity. The interaction between SLE and FO was not statistically significant.

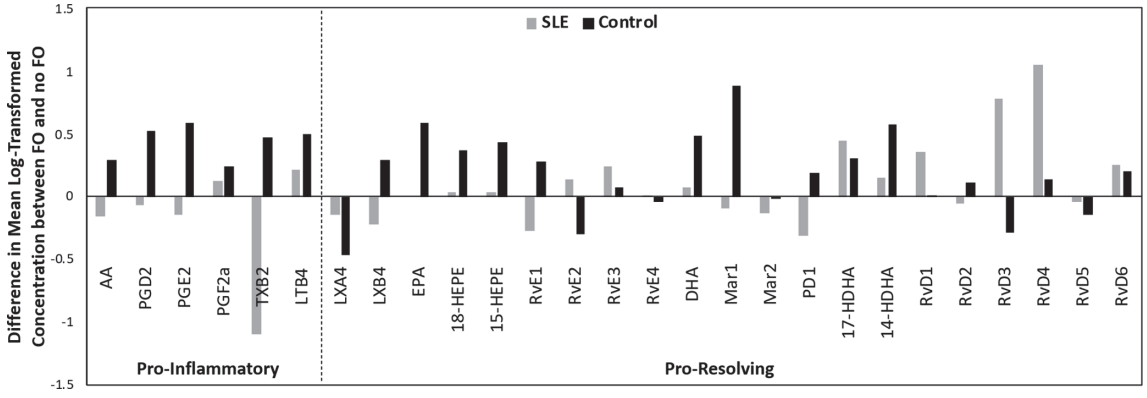
Conclusions In this cross-sectional study, FO supplementation among SLE patients was not significantly associated with higher levels of several pro-resolving SPMs. This may be related to a higher level of inflammatory burden in SLE patients at baseline, reduced ability to biosynthesize SPMs, or failure to take regular and adequate doses of FO. As FO preparations and doses were not controlled in this observational study, further larger controlled studies should pursue these observations.

1103 PERFLUOROALKYL SUBSTANCES AND COMMUNITY VULNERABILITY: ASSOCIATIONS WITH LUPUS-RELATED AUTOANTIBODIES AND DISEASE

Emily L Vara, Dulaney A Wilson, John L Pearce, Jim C Oates, Diane L Kamen*. *Medical University of South Carolina, USA*

10.1136/lupus-2021-lupus21century.46

Background Perfluoroalkyl substances (PFAS) are a class of persistent organic pollutants found in nonstick products, water repellant fabrics, fire-retardant foams, and food packaging.



Abstract 1102 Figure 1 Difference in mean log-transformed Omega-3 fatty acid derived lipid concentration between taking vs. not taking fish oil supplementation among SLE and controls
No statistically significant differences were found after adjustment for multiple comparisons was performed using false discovery rate of 0.05.
Abbreviations: LTB4, Leukotriene B4; LXA4, Lipoxin A4; LXB4, Lipoxin B4; MaR1-2, maresin 1-2; PGD2, Prostaglandin D2; PGE2, Prostaglandin E2; PGF2a, Prostaglandin F2 alpha; TXB2, Thromboxane B2; PD1, protectin D1; RvD1-6, resolvin D-6; RvE1-4, resolvin E1-4; 14-HDHA, 14-hydroxy-docosahexaenoic acid; 15-HEPE, 15-hydroxyeicosapentaenoic acid; 17-HDHA, 17hydroxy-docosahexaenoic acid; 18-HEPE, 18-hydroxyeicosapentaenoic acid.

Highly stable, the compounds persist in soil and water, bioaccumulate, and are found in the blood and tissues of animals and humans. Several PFAS, including perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), have been associated with negative health effects through hormone disruption and immunologic dysfunction.

This ongoing study explores the associations between PFAS biomarkers, autoimmunity, and neighborhood-level social determinants of health among African Americans participating in a population-based cohort study.

Methods Data was utilized from a longitudinal study of Gullah African American patients with SLE and non-SLE controls. Demographics, medical history, Social Vulnerability Index (SVI) (incorporating socioeconomic status, household composition, race/ethnicity/language, and housing/transportation), antinuclear antibody (ANA) status and titer, serum PFOA concentration (ng/ml), and serum PFOS concentration (ng/ml) from in-person visits from 2003-2019 were included. Spatial overlays were applied to assign census tract identifiers and obtain SVI data for the participants. Statistical analysis using univariate and multivariate linear regression was performed.

Results A total of 81 participants, including 10 patients with SLE and 71 non-SLE controls were evaluated. All were non-Hispanic black, 85% female and 15% male (table 1). Participants with PFOS exposure had a 30% increase (worsening) in SVI for every one unit increase in the serum PFOS concentration (95% CI 0.04-0.60). PFOA concentration was not significantly associated with SVI, 95% CI -1.63-4.39. Adjusting for SLE, age, and gender, there was no significant association between SVI and PFOS (95% CI -0.004, 0.70) or PFOA (95% CI -2.24, 5.08).

Participants with a positive ANA had a statistically significant increase in SVI of 16% compared to those with a negative ANA, 95% CI 3.17-29.07. There was not a significant difference in SVI between patients with SLE and controls (95% CI -26.9-12.75).

Conclusion In our study of African Americans with and without SLE, PFOS, but not PFOA, exposure was associated with higher social vulnerability measured by the SVI. ANA positivity was also associated with higher SVI, although SLE diagnosis was not, likely due to the small number with SLE. These findings support continued studies of PFAS and other environmental contaminants which are associated with disparities in exposure, putting vulnerable communities at risk for adverse health impacts such as SLE.

Acknowledgements This work was supported by National Institute of Arthritis and Musculoskeletal and Skin Diseases grants P30AR072582 (JCO), K24AR068406 (DLK), and P30AR072582 (GSG). I would also like to acknowledge the participants in the Systemic Lupus Erythematosus in Gullah Health (SLEIGH) study.

Abstract 1103 Table 1 Demographics, Serology and Toxicology Levels of Cohort

	Total (N=81)	Cases (N=10)	Controls (N=71)	p-value
Gender	Number (%)	Number (%)	Number (%)	
Female	69 (85.2)	9 (90)	60 (84.5)	0.65
Male	12 (14.8)	1 (10)	11 (15.5)	
Age at visit/sample collection (years ± sd)	50.6 ± 14.7	45.4 ±13.0	51.3 ± 12.0	0.24
Race				
Other	0 (0.0)	0 (0.0)	0 (0.0)	
African American	81 (100.0)	10 (100.0)	71 (100.0)	
ANA positivity				
Yes	47 (58.0)	10 (100.0)	37 (52.1)	0.004
No	34 (42.0)	0 (0.0)	34 (47.9)	
ANA titer high (> 1:320)				
Yes	17 (21.0)	8 (80.0)	9 (12.7)	< 0.001
No	64 (79.0)	2 (20.0)	62 (87.3)	
PFOS (ng/ml)	24.7 ±21.8	8.7 ±5.4	27.0 ±22.2	<0.001
PFOA (ng/ml)	3.6 ±2.2	2.3 ±1.5	3.8 ±2.2	0.04
Social vulnerability index	0.5 ±0.3	0.5 ±0.4	0.6 ±0.3	0.48

1104 UPDATE ON THE STUDY OF ANTI-MALARIALS IN INCOMPLETE LUPUS ERYTHEMATOSUS (SMILE) CLINICAL TRIAL

[1]David Karp*, [2]Nancy Olsen, [2]Duanping Liao, [3]Judith James, [3]Cristina Arriens, [4]Diane Kamen, [5]Mariko Ishimori, [6]Susan Boackle. *[1]University of Texas Southwestern Medical Center, Dallas, TX USA; [2]Hershey Medical Center, Penn State University, Hershey, PA USA; [3]Oklahoma Medical Research Foundation, Oklahoma City, OK USA; [4]Medical University of South Carolina, Charleston, SC USA; [5]University of Colorado Anschutz Medical Campus, Aurora, CO USA*

10.1136/lupus-2021-lupus21century.47

Background There is clear evidence that clinical and laboratory features of systemic lupus erythematosus (SLE) can be present for many years prior to an individual fulfilling the full disease classification criteria. Most commonly, these features include characteristic serologies, but also isolated hematological findings, rash, serositis, or hypocomplementemia. Such individuals may be considered to have 'Incomplete Lupus Erythematosus' or ILE, and some eventually transition to frank SLE over time. There is retrospective evidence that hydroxychloroquine (HCQ) use delayed this progression to SLE. The SMILE trial was undertaken to study the ability of HCQ to prevent progression to lupus in people at risk.

Methods SMILE is an NIH-funded, multi-center, randomized, placebo-controlled study of HCQ in people with an ANA (1:80 by IF) and one or two SLICC criteria for the classification of SLE. Participants can be either sex, ages 15-49, and could not have other definite autoimmune disease or fibromyalgia. The primary end point is the rate of development of new lupus criteria. Subjects are randomized to HCQ or placebo and followed for 24 months or until the development of SLE. Assessments done every 3 months included determination of any new SLICC criteria by history, physical and laboratory, as well as banking of serum, plasma, peripheral blood mononuclear cells, DNA, RNA and urine.

Results Enrollment began in early 2018 and is anticipated to end in the Fall of 2021 with study completion in 2023. Currently, all results remain blinded. As of May 2021, a total of 222 participants were screened and 157 randomized. 31 completed the protocol, 29 were discontinued by clinical staff, and 29 withdrew from the study. 16 participants (10.2%) developed classification criteria for lupus. The remainder of the participants remain in the study. 352 adverse events