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THU0100 IN EARLY INFLAMMATORY ARTHRITIS A LYMPHOID PATHOTYPE SIGNIFICANTLY ASSOCIATES WITH REQUIREMENT FOR BIOLOGIC THERAPY AT 12 MONTHS FOLLOW UP: RESULTS FROM THE PATHOBIOLOGY OF EARLY ARTHRITIS COHORT (PEAC)

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Background: Early aggressive treatment in RA equates to better long term outcomes, however targeting aggressive therapies including biologics to patients with the worse prognosis is critical to deliver acceptable risk/benefit ratios and health economic improvements. Such an approach requires prognostic biomarkers, whether the well recognised heterogeneity in synovial pathobiology in early RA translates to specific disease outcomes is currently unknown.

Objectives: The aim of this study was to investigate whether in a treatment naïve early inflammatory arthritis cohort, baseline synovial pathotype significantly associates with disease outcome at 12 months.

Methods: 166 consecutive DMARD naïve patients recruited as part of PEAC at Barts Health NHS Trust with synovial tissue suitable for analysis were included. At baseline patients were classified as RA (2010 ACR/EULAR criteria) or undifferentiated (UA). All patients underwent a baseline synovial biopsy of a clinically active joint along with collection of demographic data. Patients were subsequently treated with DMARD +/- steroid therapy with aim for low disease activity (DAS < 3.3). At 6 month follow up patients were escalated to biologic therapy if fulfilling UK NICE guidelines. At 12 months patients were classified as: (i) no treatment, (ii) DMARDs, and (iii) Biologic +/- DMARDs. Sequentially cut sections of baseline synovial biopsies underwent immunohistochemical staining and semi-quantitative scoring (0-4) to determine the degree of CD20+Bcells, CD3+T cells, CD68+ lining (l) and sublining (sl) macrophage and CD138+ plasma cell infiltration. Sections were categorised into 3 pathotypes, (i) Fibroid: (CD68 SL < 2 and or CD3, CD20, CD138 < 1), (ii) Myeloid: (CD68SL > 2, CD20 < 1 and or CD3 > 1) and (iii) Lymphoid: (grade 2-3 CD20+ aggregates, CD20 > 2).

Results: 79% were classified as RA and 21% as UA. Mean disease duration was 9.27 months. 92% (153/166) patients had follow-up at 12 months. 29% (44/153) of patients were classified as fibroid, 34% (52/166) as myeloid and 37% (57/166) as lymphoid. At baseline patients with a lymphoid pathotype had a significantly higher CRP and DAS28 and were significantly more likely to be sero positive for RF and ACPA ($p < 0.05$), suggesting that a lymphoid pathotype is associated with higher levels of disease activity. At 12 months follow up a significantly higher proportion of patients classified as lymphoid vs myeloid or fibroid (58% vs 21% vs 21%) required biologic therapy.

Conclusions: Results demonstrate that in an early inflammatory arthritis cohort

N=153	Fibroid (44)	Myeloid (52)	Lymphoid (57)	p-value
No treatment (14) n (%)	6 (42%)	6 (42%)	2 (14%)	<0.05*
DMARD (101) n (%)	30 (29%)	38 (37%)	33 (32%)	
Biologic +/- DMARD (38) n (%)	8 (21%)	8 (21%)	22 (58%)	

a lymphoid pathotype significantly associates with higher disease activity at baseline, sero positivity for RF and ACPA and a requirement for more aggressive therapy at 12 month. This supports a direct role for synovial lymphoid structures in disease pathogenesis and suggests a role as a prognostic biomarker facilitating early stratification of aggressive therapeutic intervention.

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THU0101 CARDIOVASCULAR MAGNETIC RESONANCE IMAGING CHARACTERISATION OF CARDIOVASCULAR ABNORMALITIES IN INDIVIDUALS AT RISK OF DEVELOPING RHEUMATOID ARTHRITIS

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Background: Inflammation is the primary contributor to excess cardiovascular (CV) disease in rheumatoid arthritis (RA), with evidence of subclinical abnormalities observed even in treatment-naïve, early RA [1]. Preliminary reports suggest citrullinated proteins are present in atherosclerotic plaque [2]. It is unclear whether immunological changes of anti-citrullinated protein antibody (anti-CCP+) positive individuals "at risk" of developing RA are associated with CV abnormality.

Objectives: To perform a pilot study to explore whether subclinical CV abnormalities are present in anti-CCP+ individuals at risk of developing RA.

Methods: Sixteen consecutive patients with non specific MSK symptoms but no synovitis, detectable anti-CCP antibody and 30 age-matched healthy controls (HC) underwent a multi-parametric 3.0T (Philips Achieva) cardiovascular magnetic resonance (CMR) study. Neither group had any history of CV disease. At-risk individuals were categorised as low and high absolute risk for RA development (<50% and ≥50% respectively) according to a published risk model [3]. CMR post-processing was performed using CVI⁴² (Circle Cardiovascular Imaging, Canada).

Results: HC and at risk individuals were well matched for baseline characteristics (table 1). Aortic strain values (distensibility, strain and stiffness index β) were lower, indicating increased aortic stiffness, in at-risk individuals than HC, numerically most pronounced those classified high risk (table 2). There were no differences in LV mass and function, late gadolinium enhancement, myocardial T1 (measure of myocardial composition) or LV S prime (longitudinal LV systolic function) (table 2).

Table 1. Baseline characteristics

	All 'at risk' RA patients (n=16)	Healthy controls (n=30)	p value
Age (years)	53±11	50±15	0.59
Males	4/16 (25%)	10/30 (33%)	0.57
Systolic BP (mmHg)	121±17	120±13	0.82
Diastolic BP (mmHg)	64±11	64±11	0.81
BMI (kg/m ²)	28±5	27±6	0.47
Diabetes	2/16	0/30	0.05
Active smoker	1/16 (6%)	3/30 (10%)	0.68
Ex-smoker	11/16 (69%)	5/30 (17%)	0.001
Mean absolute pre-	45%	-	-

Table 2. Results table

	All 'at risk' RA individuals (n=16)	Low 'at risk' RA individuals (n=10)	High 'at risk' RA individuals (n=6)	Healthy controls (n=30)	p value
Aortic Distensibility (10 ⁻⁴ mmHg)	3.6±1.4	4.1±1.5	2.8±0.5	4.7±2.0	0.05
Aortic strain	0.20±0.06	0.21±0.07	0.18±0.03	0.25±0.09	0.03
Aortic stiffness index, β	3.5±1.0	3.2±1.0	4.0±0.8	2.7±0.8	0.007
Myocardial native T1	1215±35	1213±36	1218±37	1202±36	0.25
Late Gadolinium enhancement	1/16	0/6	1/10	1/30	-
LV ejection fraction (%)	62±4	62±5	63±3	62±5	0.94
RV ejection fraction (%)	55±6	54±4	58±7	54±6	0.47
Indexed LV mass (g/m ²)	46±10	45±8	49±14	49±8	0.29
Indexed LV volume (ml/m ²)	83±12	81±13	87±12	80±11	0.34
LV S prime (s-1)	1.1±0.1	1.2±0.1	1.0±0.1	1.1±0.1	0.37