Methods: A cross-sectional study was performed, including patients with RA according to 2010 ACR/EULAR criteria attended in our Hospital between February and March 2018. Demographic, clinical and analytical characteristics of patients were registered. Number of painful and swollen joints were assessed for each patient, including wrist, metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints. Subsequently, a standardised photograph of the dorsal aspect of both hands was taken with a thermal camera (FLIR T250 model) (Figure 1). With this technique mean temperature (MeanT) and maximum temperature (MaxT) were assessed at each joint. Also, differential temperature (DifT) was assessed (mean temperature at joint - temperature at forearm skin).

Results: We included a total of 42 patients. 76% were women, mean age at diagnosis was 56.7 years old. 29 patients were positive for rheumatoid factor and 31 for anti-citrullinated peptide antibody. At the time of the assessment, medium CRP was 9.19 mg/L and ESR was 14.77 mm/h.

MeanT for the 65 swollen joints was 1.5°C higher than the 847 non-swollen joints ($p=0.000$). Independent analysis for each joint level (wrist, MCP and PIP) revealed higher temperature in swollen joints (Table 1). Similar results were obtained for painful joints. ROC curves and areas under the curve (AUC) were calculated for wrist, MCP and PIP joints, obtaining the most favorable results for DifT in wrist and MCP joints, and for MaxT in PIP joints, allowing to calculate a cut-off point at each joint level (Table2).

Figure 1. Selective temperature increase over third PIP of the left hand.

	Swollen	Number of joints	MeanT	P value	MaxT	P value	DifT	P value
TOTAL	NO	847	31.68°C	0.000	32.26°C	0.000	-1.26°C	0.000
	YES	65	33.18°C		33.71°C		-0.28°C	
Wrist	NO	68	32.62°C	0.005	33.21°C	0.004	-0.31°C	0.000
	YES	14	33.79°C		34.40°C		+0.55°C	
MCP	NO	391	32.02°C	0.044	32.72°C	0.066	-0.95°C	0.036
	YES	23	33.02°C		33.61°C		-0.15°C	
PIP	NO	388	31.18°C	0.000	31.64°C	0.000	-1.74°C	0.013
	YES	28	33.01°C		33.47°C		-0.81°C	

Table 1. Correlation between swollen joints and MeanT, MaxT and DifT.

	AUC	Cut-off value	Sensibility	Specificity
Wrist	0.878 (DifT)	-0.0169°C	0.929	0.743
MCP	0.640 (DifT)	+0.10331°C	0.609	0.770
PIP	0.713 (MaxT)	34.27°C	0.679	0.770

Table 2. AUC, sensibility and specificity.

Conclusion: In patients with RA, there is a statistically significant relationship between joint temperature measured by thermal imaging and the presence of swollen and painful joints in the assessment by the rheumatologist. The ROC curves indicate an acceptable sensitivity and specificity and allow to determine cut-off temperatures for clinical use.

Infrared thermography could be a useful tool in the assessment and monitoring of arthritis in RA patients.

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THU0088 BASELINE ADIPONECTIN LEVELS PREDICT FUTURE DEVELOPMENT OF RHEUMATOID ARTHRITIS IN SUBJECTS WITH OBESITY

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Background: Adiponectin is a cytokine produced by the adipose tissue and is involved in both metabolic and inflammatory processes¹. In obese subjects, serum adiponectin levels are surprisingly low². On the contrary, adiponectin levels are increased in serum and synovial fluid of subjects with established rheumatoid arthritis (RA)^{1,3}.

Objectives: By exploiting a longitudinal study enrolling more than 4000 obese subjects, we aim to determine if serum adiponectin levels are a risk factor for the development of RA in obese subjects.

Methods: The Swedish Obese Subjects (SOS) study is a longitudinal controlled trial on the effect of bariatric surgery on the incidence of obesity-related diseases. It includes 4047 obese subjects whereof 2010 underwent bariatric surgery and 2037 constituted the matched control group^{4,5}. SOS study participants who developed RA were identified by searching the Swedish National Patient Register. Eleven subjects with prevalent RA at baseline are excluded by the analyses. Patients were followed up until diagnosis of RA, death, migration or end of follow-up (December 2016). Total adiponectin was measured using the Quantikine ELISA kit from Quantikine ELISA kit from Bio-Techne (Minneapolis, MN, USA).

Results: Adiponectin measurement at baseline was available for 3691 subjects. Among those subjects, 82 subjects developed RA during a follow up for up to 29 years. High serum adiponectin levels at baseline were associated with the incidence of RA, independently of bariatric surgery, sex, age, body-mass index, smoking, and C-reactive protein and erythrocyte sedimentation rate levels (adjusted Hazard Ratio HR per 10 µg/mL adiponectin 1.70, 95% confidence interval CI 1.12-2.60, P value=0.01). When stratifying the population according to the median of baseline adiponectin, subjects with adiponectin greater than 6.8 µg/mL had a higher risk to develop RA during follow up (log-rank P 0.028, unadjusted HR 1.64, 95% CI 1.05-2.56, P=0.03, Figure 1).

Conclusion: In a large cohort of obese subjects followed up for up to 29 years, serum adiponectin levels were associated with the incidence of RA years before the onset of clinical signs. The association between adiponectin and the incidence of RA was independent of other risk factors, including C-reactive protein, smoking and bariatric surgery.

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Abstract THU0088 – Figure 1. Cumulative incidence of RA in the SOS study stratified by baseline adiponectin

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THU0089 ASSOCIATION OF ANTI-PAD4 ANTIBODIES WITH EROSION AND BIOLOGICAL TREATMENT USE IN RHEUMATOID ARTHRITIS

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Background: Novel biomarkers have been described in rheumatoid arthritis (RA) patients, including antibodies to carbamylated proteins (anti-CarP) and to protein-arginine deiminases (PAD). Anti-PAD4 antibodies are associated with anti-citrullinated protein antibodies (ACPA) and worse baseline radiographic joint damage [1]. A subset of anti-PAD4 antibodies that cross-react with PAD3 and are associated with erosive disease, ACPA and progress despite treatment have also been described [1].

Objectives: To evaluate several novel RA markers in a cohort of RA and controls and their association with erosive disease and biological treatment use in RA.

Methods: Sera from 116 RA patients [63 young onset RA (YORA) and 53 elderly onset RA (EORA)] and 155 controls [134 polymyalgia rheumatica (PMR) patients and 21 healthy individuals (HI) older than 60 years old] were included. Information on erosion status and biological treatment was available for 56 of the RA patients. The samples were tested for anti-PAD3 and anti-PAD4 IgG using the novel particle-based multi-analyte technology (PMAT, research use only, RUO), as well as for ACPA [CCP3 IgG ELISA and chemiluminescent immunoassay (CIA)] and anti-CarP IgG (ELISA, RUO).

Results: Significantly higher levels of anti-PAD3, anti-PAD4 and ACPA (ELISA and CIA) but not CarP were observed in YORA vs. EORA ($p < 0.0001$ for anti-PAD3 and ACPA ELISA and CIA, $p = 0.0016$ for anti-PAD4). In the RA patients with erosion and treatment information available, anti-PAD4 antibody levels, but not ACPA, anti-CarP or anti-PAD3, were significantly higher in patients on biologic treatment vs. patients that were not on biologics ($p = 0.0017$). Anti-PAD4 positive patients, were 10.1 [95% CI 2.5-52.0, $p = 0.0002$] times more likely to be on biologic treatment vs. the negative group. Similarly, anti-PAD4 antibodies, but neither ACPA nor anti-CarP or anti-PAD3, were also significantly higher in patients with joint erosions ($p = 0.0354$). All patients that were positive for anti-PAD4 antibodies

($n = 21$) had erosive disease. Anti-PAD4 positive patients, were 20.2 [95% CI 1.1-363.2, $p = 0.0041$] times more likely to have erosive disease.

Conclusion: Anti-PAD3, anti-PAD4 and ACPA are associated with disease onset at an early age. Anti-PAD4 are associated with erosive disease and biological treatment use in RA and represent a useful marker for better patient stratification.

Abstract THU0089 – Figure 1. Association of anti-PAD4 antibodies with joint erosion status (A) and to biological treatment use (B). Results are in Median Fluorescence Intensity (MFI). P-values of the Mann-Whitney analysis are shown in red. Dashed line indicates the preliminary cut-off of the assay. Number of positives and % within each subgroup are shown.

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THU0090 MORTALITY OVER UP TO 14 YEARS FOLLOW-UP IN MTX-REFRACTORY PATIENTS RANDOMIZED TO A STRATEGY STARTING WITH ADDITION OF INFLIXIMAB OR ADDITION OF SULFASALAZINE AND HYDROXYCHLOROQUINE

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Background: Longevity is the ultimate health outcome measure, incorporating treatment effectiveness as well as treatment safety. Randomized

Table 1. Prevalence of the assays in the different groups and in the entire cohort (percentage and number of individuals).

Assay/Group	PMR	HI	YORA	EORA	RA (YORA+EORA)	Total
% (N/total)	49% (134/271)	8% (21/271)	23% (63/271)	20% (53/271)	43% (116/271)	100% (271/271)
CCP3 ELISA	7% (9/134)	0% (0/21)	92% (58/63)	23% (12/53)	60% (70/116)	29% (79/271)
CCP3 CIA	7% (9/134)	0% (0/21)	95% (60/63)	25% (13/53)	63% (73/116)	30% (82/271)
CarP ELISA	41% (55/134)	14% (3/21)	49% (31/63)	62% (33/53)	55% (64/116)	45% (122/271)
PAD3 PMAT	1% (1/134)	5% (1/21)	16% (10/63)	0% (0/53)	9% (10/116)	4% (12/271)
PAD4 PMAT	10% (13/134)	14% (3/21)	38% (24/63)	13% (7/63)	27% (31/116)	17% (47/271)
PAD3+/4+ PMAT	1% (1/134)	0% (0/21)	16% (10/63)	0% (0/63)	9% (10/116)	4% (11/271)