Conclusion: Our study is the first to describe PAD1 and PAD6 as novel antigenic targets in RA and to demonstrate that the anti-PAD4 B-cell immune response uses all three isotypes (IgG, IgA and IgM). The strong and significant association between anti-PAD4 IgA and joint erosion is of particular clinical relevance.

Disclosure of Interests: Laura Martinez-Prat Employee of: I am an employee of Inova Diagnostics, an in vitro diagnostics company., Mary Ann Aure Employee of: I am an employee of Inova Diagnostics, an in vitro diagnostics company., Chelsea Bentow Employee of: I am an employee of Inova Diagnostics, an in vitro diagnostics company., David Lucia Employee of: I am an employee of Inova Diagnostics, an in vitro diagnostics company., Marcos Lopez-Hoyos Consultant of: Inova Diagnostics, an in vitro diagnostics company., Michael Mahler Employee of: I am an employee of Inova Diagnostics, an in vitro diagnostics company.

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Cardiovascular disease and malignancies in RA

OP0119

NOT ALL THE SAME? REACHING REMISSION REDUCES THE RISK OF CVD IN PATIENTS WITH RA, BUT PATIENTS ON BIOLOGICS MAY BE BETTER PROTECTED

I. J. Berg¹, S. Lillegraven¹, E. Kristianslund¹, T. K. Kvien¹, S. Aarrestad Provan¹.
¹Diakonhjemmet Hospital, Rheumatology, Oslo, Norway

Background: Disease activity is a risk factor for the development of cardiovascular disease (CVD) in patients with rheumatoid arthritis (RA). Remission is the preferred treatment target in RA, and may be achieved by treatment with both conventional synthetic DMARDs (csDMARDs) and biologic DMARDs (bDMARDs).

Objectives: To compare the risk of CVD in patients reaching RA disease remission vs. non-remission by 6 months. Additionally; to compare the risk of CVD in RA patients reaching remission on bDMARDs vs. csDMARDs

Methods: The NOR-DMARD is a multi-centre prospective observational study that was established in 2000. Until 2012, patients who started on any DMARD were included, while only patients starting bDMARDs were included after 2012. Disease activity and markers of inflammation (Erythrocyte Sedimentation Rate (ESR) and C-reactive protein (CRP mg/L) were measured at regular intervals. In these analyses we used data from baseline, 3-month and 6-month visits in patients with clinical RA included in the study from 2009. Patients with prior CVD were excluded from the study. Remission was assessed according to several criteria, and should be attained by the 6-month visit.

NOR-DMARD data were linked to the National Death Registry and National Patient Register. The latter records all diagnoses given at any hospital admission, inpatient and outpatient, from 2009. CVD was defined as a diagnosis of myocardial infarction, chronic heart failure, cerebrovascular disease or sudden CV death in ICD10. Using cox-regression models, we compared the time until the first recorded CVD diagnosis RA disease remission vs non-remission for the first 4 years after start of therapy. The models were adjusted for age and gender. Additionally, we explored interactions between bDMARD vs. csDMARD, remission and non-remission in age and gender adjusted models.

Results: Data were available for 3251 patients, mean (SD) age, 53.6 (13.5) years, number (%) females 2483 (76.4). The total patient years at risk were 5784, during which there were 65 CVD events. The HR across remission criteria are presented in table 1. Patients in disease remission had a significantly lower HR for CVD compared to those not in remission. There was no statistically significant difference in HR for CVD between patients in remission who were treated with bDMARDs vs csDMARDs.

Table 1.

	NOR-DMARD N=3251	p	bDMARDs N=2622	p	csDMARDs N=629	p
	HR (95% CI)		HR(95% CI)		HR(95% CI)	
DAS28-ESR remission vs non-remission	0.40 (0.21,0.74)	0.01	0.30 (0.14,0.65)	0.002	0.75 (0.26,2.22)	0.61
DAS28-CRP remission vs non-remission	0.48 (0.28,0.83)	0.01	0.42 (0.23,0.81)	0.01	0.68 (0.2,1.90)	0.46
CRP <=10	0.55 (0.30,1.03)	0.06	0.67 (0.31,1.47)	0.32	0.46 (0.16,1.36)	0.16
Boolean remission	0.63 (0.34,1.84)	0.33	0.49 (0.15,1.59)	0.23	0.93 (0.21,4.10)	0.92
SDAI remission	0.70 (0.37,1.34)	0.28	0.61 (0.28,1.34)	0.22	1.04 (0.33,3.30)	0.95
CDAI remission	0.69 (0.37,1.29)	0.25	0.61 (0.28,1.34)	0.25	1.04 (0.33,3.30)	0.98

DAS28-ESR and DAS28-CRP remission: <2.6, Boolean remission: tender and swollen joint count <=1, CRP mg/L<=10, patient global <1 (0-10), CDAI remission: <=2.8, SDAI remission <=3.3

Figure 1

Conclusion: Patients on bDMARDs who achieved DAS28, DAS28-CRP remission, or CRP less than 10 mg/L by the 6-month follow-up were less likely to experience a CVD, compared to patients not achieving remission. The HRs for CVD were higher for patients in remission on csDMARDs, compared to patients on bDMARDs, but the difference was not statistically significant and should be further explored.

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OP0120

BIOLOGICS MAY PREVENT CARDIOVASCULAR EVENTS IN RHEUMATOID ARTHRITIS BY INHIBITING CORONARY PLAQUE FORMATION AND STABILIZING HIGH-RISK LESIONS

G. Karpouzias¹, S. Ormseth², E. Hernandez², M. Budoff¹.
¹Lundquist Institute for Biomedical Innovation, Torrance, United States of America;
²Lundquist Institute of Biomedical Innovation, Torrance, United States of America

Background: Biologic disease-modifying antirheumatic drugs (bDMARDs) effectively control inflammation and may improve cardiovascular outcomes in Rheumatoid arthritis.

Objectives: To evaluate if bDMARDs decrease long-term cardiovascular disease (CVD) risk in rheumatoid arthritis and whether potential benefits might be rendered by impacting coronary plaque formation or progression.

Methods: In this single-center observational cohort study, 150 patients underwent computed tomography angiography for evaluation of coronary atherosclerosis (total, non-calcified, mixed/calcified and low-attenuation or high-risk plaque); 101 had repeat assessments within 6.9±0.3 years to evaluate plaque progression. All CVD events were prospectively recorded, including cardiac death, myocardial infarction, unstable angina, revascularization, stroke, claudication, and heart failure hospitalization. The Framingham-D'Agostino score assessed clinical risk. Segment stenosis score (cumulative stenosis) measured plaque burden. The effect of bDMARD treatment on CVD events was assessed using marginal structural models. The inverse probability of treatment and censoring weights were used in a weighted pooled logistic regression with current bDMARD use and time since study entry included in the model to approximate a Cox proportional hazards model allowing for time-varying weights. Robust logistic regression evaluated the effect of bDMARD exposure (>50 percent of follow-up period) on likelihood of new plaque formation or change in plaque composition in per-segment models adjusted for Framingham-D'Agostino score, time between scans, statin duration, cumulative prednisone dose and time-averaged CRP.

Results: Sixteen patients incurred 19 CVD events. Current bDMARD use associated with lower CVD risk (OR=0.20 [95%CI=0.05-0.75], $p=0.018$, Figure 1). However, the effect of bDMARDs was no longer significant when a 6-month exposure extension was applied (OR=0.42 [95% CI 0.13-1.38], $p=0.15$). The effect of bDMARD use on CVD risk was moderated by non-calcified plaque and low-attenuation plaque presence (Figure 1); specifically, bDMARDs were associated with lower CVD risk only in patients with non-calcified plaque ($p=.048$) or low-attenuation plaque ($p=0.036$) at baseline. Per-segment plaque progression analyses showed no main effect of bDMARD exposure on likelihood of new plaque formation (Figure 2). However, bDMARD exposure predicted lower likelihood of new plaque forming in segments without plaque among patients without mixed/calcified plaque in other coronary segments (OR=0.40 [95%CI=0.17-0.93]), but not among those with mixed/calcified plaque elsewhere in their arteries (OR=1.60 [95%CI=0.71-3.62]). Moreover, transition of non-calcified to mixed/calcified plaque associated with bDMARD exposure (OR=4.00 [95%CI=1.05-15.32]). bDMARD use also predicted low-attenuation plaque loss ($p=0.042$).

Figure 1. Effect of bDMARD use on cardiovascular disease risk stratified by coronary plaque presence

A Outcome: New Plaque Formation

B Plaque transition

Figure 2. Effect of bDMARD exposure on plaque formation and transition from baseline to follow-up

Conclusion: In rheumatoid arthritis, bDMARD use associated with reduced long-term CVD risk, lower likelihood of new plaque formation in patients with early atherosclerosis, stabilization of high-risk plaque and protective calcification of non-calcified lesions.

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OP0121

MANAGEMENT OF DYSLIPIDAEMIA AND HYPERTENSION IN PATIENTS WITH RHEUMATOID ARTHRITIS – DATA FROM 19 COUNTRIES

S. Rollefstad¹, E. Ikdahl¹, J. Sexton¹, G. Kitas², P. Van Riel³, C. S. Crowson⁴, I. Graham⁵, A. G. Semb¹ on behalf of the SURF-RA Collaborators.

¹Diakonhjemmet Hospital, Oslo, Norway; ²Russells Hall, Dudley, United Kingdom; ³Radboud Hospital, Nijmegen, Netherlands; ⁴Mayo Clinic, Rochester, United States of America; ⁵Trinity College Dublin, Dublin, Ireland

Background: The realisation that subjects with rheumatoid arthritis (RA) are at increased risk of cardiovascular disease (CVD) has led to a growing interest in risk factor control in such people, but whether this has influenced the management of dyslipidaemia and hypertension (HT) is uncertain. In subjects with coronary heart disease (CHD), audits of CVD risk factor control are regularly performed, which makes it possible to evaluate guideline implementation over time.¹ Updated surveys on CVD risk management in patients with RA are needed.

Objectives: To describe differences in lipid and blood pressure (BP) levels among patients with RA from five world regions. Furthermore, to evaluate attainment of guideline recommended targets for lipid lowering and antihypertensive treatment.

Methods: The Survey of CVD Risk Factors in patients with RA (SURF-RA) was conducted at 53 centres in 19 countries from 2014 to 2019. Data including demographics, RA disease characteristics, CVD comorbidity, risk factors and use of preventive treatment was collected. HT was defined as self-reported HT, and/or measured BP $\geq 140/90$ mmHg, and/or use of anti HT medication (a-HT). The treatment goal of a-HT was BP $< 140/90$ mmHg. The 10-year risk of a fatal CVD event was calculated by the European CVD risk calculator, the Systematic Coronary Risk Evaluation (SCORE), and was thereafter multiplied with 1.5 as recommended by the European League Against Rheumatism. Patients were classified in a high or very high CVD risk group according to the 2012 European Society of Cardiology guidelines, with low density lipoprotein cholesterol (LDL-c) goal at < 2.6 and < 1.8 mmol/L, respectively.²

Results: In total, 14503 RA patients were included. The mean age was 59.8 ± 13.6 years, and it was a strong female preponderance (74%). Nearly 2/3 of the patients were hypertensive. Use of a-HT in the total population differed substantially between the cohorts with limited use in West Europe and Latin America (17.4% and 24.8%), in contrast to North America and East Europe (46.8% and 57.0%). On average, half of those with HT were at the recommended BP goal. The lowest BP goal attainment was seen in Asia, West and East Europe (40.8-43.1%), and the highest in North America (63.5%). Overall 51.5% had an indication for lipid lowering therapy (LLT), and of these 43.5% were taking LLT. Only 34.0% of patients with an indication for LLT were at recommended LDL-c goals. The proportion of RA patients on target for LDL-c varied greatly between regions, from 23.1% in East Europe to 51.0% in North America. The LDL-c goal attainment was higher in RA patients at high risk (45.1%) compared to those at very high risk of CVD (18.0%).

Conclusion: This large international survey on RA patients revealed considerable geographical differences in CVD preventive treatment. Lower goal attainment for LLT than reported for subjects with CHD was observed. We conclude that there is a substantial need for improvement in CVD preventive measures in RA patients.

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OP0122

SUBCLINICAL ATHEROSCLEROSIS OF FEMORAL ARTERIES IN RHEUMATOID ARTHRITIS. AN ULTRASOUND STUDY

J. Medina¹, F. Aramburu¹, C. González Montagut¹, D. Sánchez¹, E. Loza².

¹University Clinical Hospital of Valladolid, Valladolid, Spain; ²InMusc Instituto de Salud Musculosquelética, Madrid, Spain

Background: Cardiovascular morbidity and mortality is increased in patients with rheumatoid arthritis (RA). This cannot be entirely explained by traditional risk factors. Inflammation and autoimmunity may play a role in the cardiovascular risk excess. Subclinical atherosclerosis is associated with a risk comparable to