Disclosure of Interests: Emma C. de Moët: None declared, Veerle Derksen: None declared, Leendert A Trouw: None declared, Chiaki Hashi: None declared, Mohammed Tikky: None declared, Hani El-Gabalawy: None declared, Holger Bang Grant/research support from: Employee of Orgentec Diagnostika, Thomas Huzinga Grant/research support from: Ablynx, Bristol-Myers Squibb, Roche, Sanofi, Consultant of: Ablynx, Bristol-Myers Squibb, Roche, Sanofi, Rene Toes: None declared, Diane van der Woude: None declared DOI: 10.1136/annrheumdis-2020-eular.3146

SAT0586 PREVALENCE AND RISK FACTORS FOR CARDIO-METABOLIC ABNORMALITIES IN PATIENTS WITH INFLAMMATORY ARTHRITIS ATTENDING CARDIO-RHEUMATOLOGY PRIMARY PREVENTION CLINICS

L. Eder1, S. Akhtar1, P. Harvey1, K. Bindee1. 1Women’s College Hospital, University of Toronto, Toronto, Canada; 2Sinai Health System, University of Toronto, Toronto, Canada.

Background: Cardio-metabolic abnormalities are common in patients with inflammatory arthritis (IA) but tend to be under-recognized and under-treated.

Objectives: We aimed to compare the prevalence and risk factors for cardio-metabolic abnormalities between patients with rheumatoid arthritis (RA), psoriatic arthritis (PsA) and ankylosing spondylitis (AS).

Methods: Consecutive patients enrolled in the University of Toronto Cardio-Rheumatology Network from July 2017 to August 2019 were analyzed. This is a primary prevention program that uses structured clinical, laboratory and multimodal imaging to diagnose and treat cardiovascular disease (CVD). Patients with a rheumatologist-confirmed diagnosis of RA, PsA or AS with no known CVD were evaluated. Information about IA diagnosis, medications and comorbidities was recorded. Each patient was evaluated by a cardiologist focusing on CVD risk assessment. We evaluated the prevalence of previously recorded and newly recognized cardio-metabolic risk factors including hypertension, dyslipidemia, obesity and diabetes. The prevalence of these abnormalities was compared between IA diagnoses. Regression models were used to assess the association between diagnosis and cardio-metabolic abnormalities after adjusting for demographics, smoking, BMI, measures of disease activity and medications.

Results: A total of 358 patients (201 RA, 124 PsA, 33 AS) were assessed (mean age 59±10.5 years, 68.7% female). Hypertension was reported in 33%, dyslipidemia in 26.8%, diabetes mellitus in 8.9% and overweight/obesity in 69.7% (Figure 1). Newly detected elevations in lipids were frequent for triglycerides (9.3%), non-HDL-cholesterol (6%) and LDL-cholesterol (2.7%). Elevated HbA1c occurred in 1.4% and newly diagnosed hypertension occurred in 9.8%. A total of 32.8% patients required a change or initiation of medications for their cardio-metabolic abnormalities (21.7% lipid-lowering therapy, 14.6% aspirin, 11.1% anti-hypertension therapy). Patients with PsA had the highest prevalence of cardio-metabolic abnormalities (21.7% lipid-lowering therapy, 14.6% aspirin, 11.1% anti-hypertension therapy). Patients with PsA had the highest prevalence of cardio-metabolic abnormalities including dyslipidemia, obesity and hypertension. Having hypertension (prior or new diagnosis), elevated levels of triglycerides, non-HDL cholesterol, total cholesterol and BMI were associated with PsA vs. RA after adjusting for potential confounders (all p<0.05) (Figure 2). No significant association was found between cardio-metabolic abnormalities and AS vs. PsA or RA.

Conclusion: Dedicated cardio-rheumatology clinics have improved CVD screening and management in an IA population. The burden of cardio-metabolic abnormalities is elevated in PsA and suggests that tailored strategies to reduce adverse CVD events are particularly needed in this subgroup.

SAT0587 MACHINE-LEARNING DERIVED ALGORITHMS FOR OUTCOMES PREDICTION IN RHEUMATIC DISEASES: APPLICATION TO RADIOGRAPHIC PROGRESSION IN EARLY AXIAL SPONDYLOARTHRITIS

R. Garbol1, 1Hospital Cochin, Rheumatology, Paris, France; 2Hospital Saint-Louis Ap-Hp, Paris, France; 3Leiden University Medical Center, Leiden, Netherlands

Background: Axial spondyloarthritis (axSpA) is a chronic rheumatic disease that encompasses various clinical presentations: inflammatory chronic back pain, peripheral manifestations and extra-articular manifestations. The current nomenclature divides axSpA in radiographic (in the presence of radiographic sacroiliitis) and non-radiographic (in the absence of radiographic sacroiliitis, with or without MRI sacroiliitis). Given that the functional burden of the disease appears to be greater in patients with radiographic forms, it seems crucial to be able to predict which patients will be more likely to develop structural damage over time. Predictive factors for radiographic progression in axSpA have been identified through use of traditional statistical models like logistic regression. However, these models present some limitations. In order to overcome these limitations and to improve the predictive performance, machine learning (ML) methods have been developed.

Objectives: To compare ML models to traditional models to predict radiographic progression in patients with early axSpA.

Methods: Study design: prospective French multicentric cohort study (DESIR cohort) with 5 years of follow-up. Patients: all patients included in the cohort, i.e. 708 patients with inflammatory back pain for >3 months but ≤3 years, highly suggestive of axSpA. Data on the first 5 years of follow-up was used. Statistical analyses: radiographic progression was defined as progression either at the spine (increase of at least 1 point per 2 years of mSASSS scores) or at the sacroiliac joint (worsening of at least one grade of the mNY score between 2 visits). Traditional modelling: we first performed a bivariate analysis between our outcome (radiographic progression in axSpA) and explanatory variables at baseline to select the variables to be included in our models and then built a logistic regression model (M1). Variable selection for traditional models was performed with 2 different methods: stepwise selection based on
Akaie Information Criterion (stepAIC) method (M2), and the Least Absolute Shrinkage and Selection Operator (LASSO) method (M3). We also performed sensitivity analysis on all patients with manual backward method (M4) after multiple imputation of missing data. Machine learning modelling: using the “SuperLearner” package on R, we modelled radiographic progression with stepAIC, LASSO, random forest, Discrete Bayesian Additive Regression Trees Samplers (DBARTS), Generalized Additive Models (GAM), multivariate adaptive polynomial spline regression (polymars), Recursive Partitioning And Regression Trees (RPART) and Super Learner. Finally, the accuracy of traditional and ML models was compared based on their 10-fold-cross-validated AUC (cv-AUC).

**Results:** 10-fold cv-AUC for traditional models were 0.79 and 0.78 for M2 and M3, respectively. The 3 best models in the ML algorithm were the GAM, the DBARTS and the Super Learner models, with 10-fold cv-AUC of: 0.77, 0.76 and 0.74, respectively (Table 1).

<table>
<thead>
<tr>
<th>Best models</th>
<th>Cross-validated AUC</th>
</tr>
</thead>
</table>
| Traditional models | M2 (step AIC method) 0.79  
M3 (LASSO method) 0.78 |
| Machine learning approach | SL Discrete Bayesian Additive Regression Trees Samplers (DBARTS) 0.76  
SL Generalized Additive Models (GAM) 0.77  
Super Learner 0.74 |

Table 1. Comparison of 10-fold cross-validated AUC between best traditional and machine learning models.

**Conclusion:** Traditional models predicted better radiographic progression than ML models in this early aSpA population. Further ML algorithms image-based or with other artificial intelligence methods (e.g. deep learning) might perform better than traditional models in this setting.

**Acknowledgments:** Thanks to the French National Society of Rheumatology and the DESIR cohort.

**Disclosure of Interests:** Pomain Garotof: None declared, Matthieu resche-rigon: None declared, Maxime Dougdous Grant/research support from: AbbVie, Eli Lily, Merck, Novartis, Pfizer and UCB Pharma, Consultant of: AbbVie, Eli Lilly, Merck, Novartis, Pfizer and UCB Pharma, Speakers bureau: AbbVie, Eli Lilly, Merck, Novartis, Pfizer and UCB Pharma, Désirée van de Heijde Consultant of: AbbVie, Amgen, Astellas, AstraZeneca, BMS, Boehringer Ingelheim, Celgene, Cytox, Daiichi, Eisai, Eli-Lilly, Galapagos, Gilead Sciences, Inc., Glaxo-Smith-Kline, Janssen, Merck, Novartis, Pfizer, Regeneron, Roche, Sanofi, Takeda, UCB Pharma, Director of Imaging Rheumatology BV, Christian Roux: None declared, Anna Moltó Grant/research support from: Pfizer, UCB, Consultant of: Abbvie, BMS, MSD, Novartis, Pfizer, UCB, DOI: 10.1136/annrheumdis-2020-eular.431

**References:**


**Disclosure of Interests:** None declared, Maxime Dougados Grant/research support from: AbbVie, Eli Lilly, Merck, Novartis, Pfizer and UCB Pharma, Speaker's bureau: AbbVie, Eli Lilly, Merck, Novartis, Pfizer and UCB Pharma, Consultant of: AbbVie, Amgen, Astellas, AstraZeneca, BMS, Boehringer Ingelheim, Celgene, Cytox, Daiichi, Eisai, Eli-Lilly, Galapagos, Gilead Sciences, Inc., Glaxo-Smith-Kline, Janssen, Merck, Novartis, Pfizer, Regeneron, Roche, Sanofi, Takeda, UCB Pharma, Director of Imaging Rheumatology BV, Christian Roux: None declared, Anna Moltó Grant/research support from: Pfizer, UCB, Consultant of: Abbvie, BMS, MSD, Novartis, Pfizer, UCB, DOI: 10.1136/annrheumdis-2020-eular.431

**Results:** From 2008 to 2015, the prevalence of nontraumatic AVN increased gradually, but its incidence did not change, with an annual average incidence of 413 per 1 million population and the male-to-female ratio of 1.2:1. The peak incidence occurred in the 50-59 year age group. The incident AVN was more prevalent in male than in female under 70, but there was female predominance after the age of 70 (Figure 1). The patients with AVN had a higher cumulative incidence of major adverse cardiovascular and cerebrovascular events than controls (19.5% versus 14.9%; p = 0.017). Upon univariate Kaplan-Meier method with the log-rank test, there was a significant difference in major cardiovascular and cerebrovascular events-free survival rates between AVN group and control group (p = 0.001). However, after adjusting for potential confounders including hypertension, diabetes, dyslipidemia, and use of steroid or statin, the association between AVN group and major adverse cardiovascular and cerebrovascular events was insignificant (adjusted HR 1.14, 95% CI 0.959-1.295, p=0.158).

**Conclusion:** In this population-based cohort study, we provided the updated epidemiologic data of Korean patients with nontraumatic AVN. The increased risk for major cardiovascular and cerebrovascular events among AVN patients was not observed in the representative Korean population.

**Disclosure of Interests:** T. Formánek 1, K. Mládi 2, M. Husákova 3, 1National Institute of Mental Health, Department of Public Mental Health, Klecany, Czech Republic; 2Charles University, Faculty of Medicine in Pilsen, Pilsen, Czech Republic; 3Institute of Rheumatology, Prague, Czech Republic

**Background:** Cohort studies using nationwide health registers have shown an increased risk for affective and anxiety disorders in people with ankylosing spondylitis (AS) and rheumatoid arthritis (RA) (1-3). Moreover, a nationwide cohort study demonstrated an increased risk for mental disorders in people with rheumatic diseases (4).

**Objectives:** We aimed to investigate the risk for psychiatric hospitalization following a rheuma-related hospitalization: results from a Czech nationwide, cohort study.

**Methods:** Using data from the Czech nationwide register of all-cause hospitalizations, we obtained 4 971 individuals hospitalized (index hospitalization) between 2004 and 2012 for rheumatic diseases - RA, spondyloarthritides (including AS, psoriatic arthritis and undifferentiated spondyloarthritides), systemic lupus erythematosus and systemic scleroderma, with no history of psychiatric and rheuma-related hospitalization in the previous 10 years from the index hospitalization. On these individuals, we randomly matched (on age, gender and year of index hospitalization) controls that were hospitalized in the same time period for a non-rheumatic disease and have no history of psychiatric and rheumatoid hospitalization in the last 10 years from their index hospitalization, in the ratio of 1:5. We employed conditional logistic regression for assessing the risk for psychiatric hospitalization in the subsequent 3 years from the index hospitalization. To strengthen our results, we repeated the matching step 100 times and run the analysis on each resulting dataset.