POS0095

DEVELOPPING A SCORE TO PREDICT PRECLINICAL INTERSTITIAL LUNG DISEASE IN PATIENTS WITH RHEUMATOID ARTHRITIS – A CROSS-SECTIONAL STUDY FROM THE ESPOIR COHORT

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Background: Interstitial lung disease (ILD) is an extra-articular manifestation of rheumatoid arthritis (RA) detected in 20% to 60% of patients with RA on high-resolution computed-tomography (HRCT) chest scan and is clinically significant in near 10%. Despite a high morbi-mortality rate, a definite strategy for preclinical ILD screening in patients with RA remains to be determined. To date, several factors have been reported to increase the risk of RA-ILD occurrence (*i.e.* older age at RA onset, ACPA positivity, male sex, RA disease activity, the *MUC5B* rs35705950 promoter variant...). However, none of these risk factors has been validated in a prospective cohort of patients with RA. The ESPOIR prospective cohort includes patients aged 18 to 70 years with recent arthritis (less than 6 months) and a definite or probable diagnosis of RA.

Objectives: To identify in the ESPOIR cohort factors associated with ILD after at least 10 years of RA duration in order to develop a predictive score to identify patients with preclinical RA-ILD.

Methods: An ILD detection by chest HRCT scan was systematically offered to every patient with definite RA after at least 10 years-follow-up. Chest HRCT scans were centrally reviewed by an experienced radiologist. Potential predictors of ILD were prospectively collected from baseline to the date of the HRCT scan, and all included patients were genotyped for *MUC5B* rs35705950. To take into account repeated measures, trajectories were determined for disease activity, C reactive protein, smoking, treatment exposure (*i.e.* prednisone, methotrexate [MTX] and biological disease modifying anti-rheumatic drugs [bDMARDs]). A logistic model was used to identify independent predictors for the occurrence of ILD on HRCT scans. Confidence intervals were estimated using sampling methods. A predictive score for preclinical ILD occurrence was developed based on the identified predictors.

Results: 163 RA patients according to 2010 ACR/EULAR classification criteria, none of whom had pulmonary symptoms, were investigated with a chest HRCT scan (128 women (78.5%), mean RA duration 13.7 ± 1.1 years, age at inclusion 47.6 y/o ± 10.4, mean disease activity score [DAS]-28 during follow up was 3.1 ± 1.0). ILD was detected in 31 patients (19.0%). The *MUC5B* rs35705950 minor allele frequency (MAF) was 22.2% and 10.0% in the RA-ILD and RA-noILD populations, respectively (OR univariate=2.6 CI_{95%} [1.2-5.5], P=0.01). After logistic regression, independent predictors for preclinical RA-ILD were male sex (OR=3.9 CI_{95%} [1.4-11.4]), older age at RA onset (OR=1.1 per year CI_{95%} [1.0-1.2]), mean DAS-28 score during the follow-up (OR=2.0 CI_{95%} [1.2-3.4]) and *MUC5B* rs35705950 T risk allele (OR=3.7 CI_{95%} [1.4-10.4]) (Figure 1). No influence of the use of RA-related drugs (prednisone, MTX or bDMARDs) was identified as risk factor. The logistic model could predict preclinical ILD occurrence after 13 years of RA duration with an AUC=0.82 CI_{95%} (0.72-0.91). A predictive score for preclinical RA-ILD based on the 4 identified predictive risk factors was developed (Sensitivity 80%, Specificity 56%).

Figure 1. Factors independently associated with preclinical ILD after 13 years of RA duration

Conclusion: In this cross-sectional study of the prospective ESPOIR cohort, we identified clinical and genetic predictors for ILD after 13 years of RA duration. We developed a predictive score that could improve risk stratification for preclinical RA-ILD and help physicians identify patients with RA in whom a HRCT scan should be performed.

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POS0096

SPLENIC METABOLIC UPTAKE IN FDG-PET/CT PREDICTS RISK OF FUTURE CARDIOVASCULAR THROMBOSIS EVENTS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Patients with the rheumatoid arthritis (RA) have an increased risk of cardiovascular disease (CVD) compared to general population. However there are insufficient modality to predict future CVD risk in RA.

Objectives: This study assessed whether splenic and arterial activity measured by positron emission tomography/ computed tomography (PET/CT) predict the risk of CVD thrombosis events beyond conventional risk factors in patients with RA.

Methods: We enrolled 84 patients with active RA who underwent fluorine-18-fluorodeoxyglucose (FDG) PET/CT and disease activity evaluation at the same time. CVD thrombosis events were independently evaluated, while blinded to activity of PET/CT, during follow up periods. FDG uptake by nuclear medicine physician was examined in the spleen and ascending aorta and blood pool activity of superior vena cava as SUV (standardized uptake values) and target-to-background-ratio (TBR) while blinded to CVD events.

Results: During follow-up periods, 19 patients developed CVD thrombosis events. Both splenic and arterial TBR were significantly increased in patients with subsequent CVD events compared to in patients without (2.19 ± 0.60 vs 1.80 ± 0.34 , $p < 0.013$, 1.72 ± 0.22 vs 1.57 ± 0.22 , $p < 0.012$). Splenic TBR was associated with an increased risk of CVD events after adjustment for conventional CVD risk factors [hazard ratio (HR): 3.15; 95% confidence interval (CI): 1.46 to 6.79; $p = 0.003$]. Moreover, the association between splenic TBR and CVD events remained significant after adjustment for disease activity (HR: 3.00; CI: 1.36 to 6.63; $p = 0.007$) and after adjustment for arterial TBR (HR: 3.00; CI: 1.36 to 6.63; $p = 0.007$).

Conclusion: Our results show splenic metabolic uptake in FDG-PET/CT in patients with RA provide information for subsequent CVD events beyond conventional risk factors.

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POS0097

JOINT INFLAMMATION TENDS TO RECUR IN THE SAME JOINTS DURING THE RHEUMATOID ARTHRITIS DISEASE COURSE

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Background: It is unknown whether in the disease course of rheumatoid arthritis (RA), inflammation recurs in the same joints over time or is more variable in joint locations. Joint involvement patterns over time might provide clues about the underlying mechanisms causing local joint inflammation.

Objectives: The aim of this study is to assess if local joint inflammation at presentation of RA tends to recur or persist in the same joints.

Methods: Data from the BeSt study were used, a treat-to-target (DAS $\leq$ 2.4) trial in newly diagnosed RA (ACR 1987 criteria) patients. During 10 years, for each patient 68 joints were assessed three-monthly (41 visits) by trained nurses for swelling (yes/no) and tenderness.

We analyzed the association between local joint swelling at baseline and later swelling of the same joint using a multilevel mixed-effects logistic regression model. Models were adjusted for joint location and for timepoint, with joints clustered within patients. A sensitivity analysis was done for the 25% most affected joints (MCP 1-3, PIP 2-3, wrists and MTP 2-4).

To investigate whether later swelling of a joint is predicted by baseline swelling of that same joint specifically, rather than by baseline swelling in general, a permutation test with 1000 permutations was performed. A p-value < 0.05 indicates that joint swelling is better predicted by its baseline swelling than by baseline swelling of randomly selected other joints.

In a separate model, with an interaction term between baseline swelling and previous visit swelling (yes/no), we evaluated if the association between baseline swelling and later local swelling was influenced by whether later swelling was persistent (swelling at both the current and previous visit) or recurrent (swelling at current visit but not at the previous visit).

Results: The 508 patients had a median (IQR) follow-up duration of 10 (6-10) years. At baseline, 8,137/34,423 (24%) assessed joints were scored as swollen. Baseline swelling was subsequently persistent in 21% of the joints with a median (IQR) duration of 1 (1-2) visit ($\pm$ 3 months after baseline). In addition, after resolution of initial swelling, swelling recurred at least once in 46% of the joints with baseline swelling. Baseline swelling was significantly associated with swelling in the same joint during follow-up (OR 2.37, 95% CI 2.30-2.43). A sensitivity analysis of the most affected joints showed similar results (OR 2.10 [95% CI 2.03-2.19]).

The permutation test showed a significant result with $p < 0.001$, indicating that joint swelling is better predicted by baseline swelling of that same joint than by baseline swelling of other joints.

The association between baseline swelling and later local swelling was weaker in case of persistent swelling than in case of recurrent swelling (interaction term baseline swelling * swelling at previous timepoint 'yes': OR 0.80 [95% CI 0.75-0.85]).

Conclusion: In newly diagnosed RA, over median 10 years of treatment to target DAS $\leq$ 2.4, baseline swelling persisted in 21% of the joints, for median 3 months after baseline. Local recurrence after initial resolution occurred in 46% of the joints. Baseline joint swelling was significantly associated with local joint swelling during follow-up, even when taking into account the higher a priori chance of swelling in the joints that are most often affected, and joint swelling during follow-up was better predicted by baseline swelling of that particular joint than by baseline swelling of other joints. Local persistence and recurrence of joint swelling despite DAS $\leq$ 2.4 steered treatment adjustments suggest that local joint conditions or even joint memory play a role in mechanisms of joint inflammation.

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POS0098

THE INFLUENCE OF THE ACTIVITY OF RHEUMATOID ARTHRITIS TO INFECTIOUS AND WOUND COMPLICATIONS AFTER TOTAL HIP AND KNEE ARTHROPLASTY

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Background: Surgical treatment of patients with rheumatoid arthritis (RA) is associated with an increased risk of complications. This is due to the presence of inflammation, many variants of the disease, reduced physical activity, severity of functional disorders, prolonged therapy with glucocorticoids, disease-modifying antirheumatic drugs (DMARDs) and biological DMARDs, osteoporosis, as well as activity of the underlying disease.

Objectives: to conduct a comparative analysis of the influence of RA activity levels on infectious complications (periprosthetic infection) and wound complications (poor healing, divergence, necrosis of the wound edges) after hip and knee arthroplasty in RA patients.

Methods: 1113 arthroplasties were analyzed in patients with RA, which were performed between 2002 and 2019. Of these, 649 total knee arthroplasties and 464 total hip arthroplasties were performed.

Results: Infectious complications after total hip and knee arthroplasty did not occur at 0 grade of disease activity (remission). At the I grade of activity, periprosthetic infections were detected with a frequency of 0.31%, at the II grade – 0.89%, and at the III level in 3.06% of cases.

Complications from the operative wound occurred in 0.91% of cases with I grade of activity, at II grade with a frequency of 5.68%, and at III – 6.98%. There were no cases of complications from the wound in patients with remission of RA.

Statistical analysis of the obtained data revealed a significantly higher number of complications in the group of RA patients ($p < 0.005$). During analyzing each type of complication, significant differences were also obtained ($p < 0.005$).

Conclusion: Risk of periprosthetic infection and complications from the wound is several times higher in patients with a high grade of RA activity. This means that performing arthroplasty, as well as other operations, in patients with high RA activity correlates to a high risk of complications.

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POS0099

CLINICAL REMISSION IN RHEUMATOID ARTHRITIS PATIENTS TREATED WITH TOFACITINIB IS ASSOCIATED WITH LOW BASELINE EXPRESSION OF GENES RELATED TO ENERGY METABOLISM AND WITH CELLULAR CAPACITY OF THEIR UPREGULATION DURING FOLLOW-UP

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