Conclusions: The current PSC models revealed a specific ROS-mediated inflammatory pathway and provide a platform for studying the pathophysiology of NNS and searching for the alternative therapeutic options for NNS and related immunoproteasome disorders.

REFERENCES:

- [1] Arima K, et al. *PNAS* 2011;108(36):14914–9.
- [2] Kawasaki Y, et al. *Arthritis Rheum* 2017;69(2):447–459.
- [3] Takada S, et al. *J Allergy Clin Immunol* 2018;141(1):339–349.

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Statistics made simple: a practical approach to complex concepts

OP0009 RISING PREVALENCE OF FUNCTIONAL DISABILITY IN PATIENTS WITH RHEUMATOID ARTHRITIS OVER 20 YEARS

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Background: Despite the advances in treatment of rheumatoid arthritis (RA) over the recent decades many patients with RA do not achieve remission or full physical functioning. The trends in prevalence of functional disability (FD) in patients with RA are not fully understood.

Objectives: To assess the prevalence of patient-reported FD in patients with RA compared to subjects without RA over the past two decades of calendar time, across different age categories and over the duration of RA disease.

Methods: This retrospective population-based cohort study included Olmsted County, MN residents who met 1987 ACR criteria for RA from 1/5/1999 to 12/31/2013 and a cohort of subjects without RA matched by age and sex from the same underlying population. Each non-RA subject was assigned an index date matching RA incidence date of a corresponding RA patient. Activities of Daily Living (ADL) were recorded annually over the past 20 years at patients' routine medical care visits based on patient provided information about performing six ADL without assistance including feeding oneself, dressing, using the toilet, bathing, walking, housekeeping. FD was defined as having difficulty with ≥ 1 of the six ADLs. Analyses were performed using age- and sex-adjusted logistic regression models with random subject effects to account for multiple measures per patient.

Results: Five hundred eighty-six patients with RA (mean age 55, 70% females) and 531 non-RA subjects (mean age 56, 70% females) have completed 7446 questionnaires (4,301 RA and 3145 non-RA) from 1/5/1999 to 1/5/2018 on or

following their RA incidence/index date. There has been a significant increase in the prevalence of FD among patients with RA compared to the non-RA cohort over the past two decades ($p=0.003$, figure 1). When analysing by age group, patients with RA compared to the non-RA subjects had at least a 15% excess in the proportion of FD at any given age up to the 8–9th decade of life while the proportions were similar in both cohorts. When analysing FD over the duration of RA disease, its prevalence was significantly higher in the RA compared to non-RA subjects, starting at RA incidence/index date (26% in RA vs 11% in non-RA subjects, $p<0.001$), with persistent excess in prevalence over the entire follow-up time. When FD was defined as having difficulty with ≥ 2 of the six ADLs the trends were similar for calendar year, age categories and RA disease duration, although the proportion of patients affected with functional disability was smaller.

Conclusions: Patients with RA have significantly higher prevalence of FD compared to their non-RA counterparts. The prevalence of FD in RA has increased in the recent decades with a persistent excess in the proportion of affected patients in the RA compared to the non-RA cohort across the age-range and over RA disease duration. This substantial and growing FD burden is despite the recent advances in controlling RA disease activity with modern antirheumatic therapies. More studies are needed to understand the underlying causes for these trends in FD and to improve outcomes in patients with RA.

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OP0010 USE OF CLAIMS AND ELECTRONIC MEDICAL RECORD DATA TO PREDICT RA DISEASE ACTIVITY

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Background: Prior studies have demonstrated challenges in developing and validating claims-based algorithms that accurately predict RA disease activity.^{1,2} The ability to adjust for and predict RA disease activity would be a powerful epidemiological tool for studies that lack direct disease activity measures such as the DAS28.

Objectives: We used machine-learning methods to incorporate claims and electronic medical record (EMR) data to develop models to predict DAS28 (CRP) as a continuous measure, and to distinguish moderate-to-high disease activity from low activity/remission.

Methods: We identified 300 adults (≥ 18 years of age) with RA enrolled in a single academic centre cohort with ≥ 1 year of linked Medicare insurance claims preceding a DAS28 (CRP) measurement between 2006 and 2010. Of these, 95 had Medicare Part D pharmacy data. From claims we included demographics, co-morbidities, joint replacement surgery, physical therapy visits, numbers of RA-related codes, laboratory values and imaging studies, and healthcare utilisation. For those with Part D pharmacy data we included medications (steroids, analgesics, DMARDs) and switches between drugs. From the EMRs we obtained smoking status, BMI, blood pressure, medication use, laboratory values for seropositivity (RF or anti-cyclic citrullinated peptide antibodies), haematocrit, ESR and CRP. We constructed models with claims only, claims with medications and claims with EMR data. We examined these models with DAS28 (CRP) as a continuous measure and as a binary outcome (moderate/high activity vs low activity/remission). We used adaptive least absolute shrinkage and selection operator (LASSO), which avoids model overfitting by penalising large coefficients and selects a subset of variables by shrinking some coefficients to zero. We used adjusted R^2 to compare continuous model fit and C-statistics to compare binary models.