Conclusions: Epoch 4 of the CLUSTER study demonstrated that optimal control of disease activity in the crFMF, TRAPS and HIDS/MKD patients can be maintained following long-term treatment with canakinumab 150/300 mg q4w. For all 3 cohorts, patients requiring 150/300 mg q8w in epoch 3 to maintain disease control were less likely to control disease during epoch 4 and therefore a substantial number of these patients were up-titrated to q4w regimen by the end of epoch 4. No new or unexpected safety issues were reported over 112 weeks of canakinumab treatment.

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Disclosure of Interest: F. De Benedetti Grant/research support from: Novartis, Roche, Pfizer, SOBI, AbbVie, Novimmune, BMS, Sanofi, J. Frenkel Grant/research support from: Novartis and SOBI, A. Simon Grant/research support from: Novartis, Xoma/Servier, CSL Behring, Consultant for: Novartis, Takeda, SOBI, Xoma, J. Anton Grant/research support from: Novartis, Consultant for: Novartis, H. Lachmann Consultant for: Novartis, SOBI, Takeda and GSK, Speakers bureau: Novartis and SOBI, M. Gattorno Grant/research support from: Novartis and SOBI, Consultant for: Novartis and SOBI, Speakers bureau: Novartis and SOBI, S. Ozen Speakers bureau: Novartis and SOBI, I. Kone-Paut Grant/research support from: Novartis, SOBI and Roche, Consultant for: Novartis, SOBI, Pfizer, AbbVie and Roche, E. Ben-Chetrit Consultant for: Novartis, M. Wozniak Employee of: Novartis, J. Wang Employee of: Novartis, E. Vrizali Employee of: Novartis

DOI: 10.1136/annrheumdis-2018-eular.5246

THU0571 PROTEOMIC IDENTIFICATION OF SYSTEMIC-ONSET JUVENILE IDIOPATHIC ARTHRITIS PHENOTYPIC BIOMARKERS

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Background: Systemic juvenile idiopathic arthritis (SJIA) is a childhood rheumatic auto-inflammatory disorder of largely unknown pathogenesis. The presence of fever, rash and arthritis support a diagnosis of SJIA, though early in disease arthritis may be minimal, complicating the exclusion of alternative diagnoses such as infection. Furthermore, two clinical phenotypes of SJIA can be identified, a chronic articular-dominant (ART_SJIA) and a classical auto-inflammatory phenotype (AID_SJIA).

Objectives: To identify novel serum protein biomarkers that may discriminate ART_SJIA from AID_SJIA and distinguish AID_SJIA from infection.

Methods: Patients with active SJIA (joint activity plus or minus fever and elevated laboratory inflammation markers) were sub-grouped into the two clinical phenotypes (ART_SJIA and AID_SJIA). Serum from patients with SJIA or confirmed infection was analysed for the standard laboratory markers: C-reactive protein (CRP), white cell count (WCC) and erythrocyte sedimentation rate (ESR). A "discovery cohort" (n=10 per group) of patient serum samples was subjected to unbiased label-free proteomics using liquid chromatography mass spectrometry (LC-MS/MS) and in a separate "verification cohort" (AID_SJIA, n=48; ART_SJIA, n=29; infection, n=32) candidate biomarkers were measured by multiple reaction monitoring MS (MRM-MS; Agilent 6490 and 6495) and microsphere bead-based immunoassay (Luminex). Serum concentrations of S100A12 and MRP8/14 were also measured in all samples using enzyme linked immunoabsorbant assays (ELISAs).

Results: The routine laboratory markers CRP, WCC, ESR, as well as ELISA-measured S100A12 and MRP8/14 serum concentrations were highest in AID_SJIA, followed by infection and were lowest in patients with ART_SJIA. Proteins identified and quantified by LC-MS/MS could differentiate patients with ART_SJIA from those with AID_SJIA (area under the curve, AUC: 0.97). The discrimination between AID_SJIA and infection performed less well, AUC: 0.58. Targeted MRM measurement of novel protein candidate biomarkers verified the discovery cohort data. A combined biomarker panel consisting of MRM, ELISA and Luminex analysis which was evaluated using a Random forest model, indicated the correct

overall identification of the clinical groups to be as follows: ART_SJIA: 24/29 (83%), AID_SJIA: 37/45 (82%) and infection: 20/32 (63%).

Conclusions: Significant differences in the serum protein signature between two phenotypes of SJIA suggest that different immunological processes may underlie these phenotypes. Serum protein profiles also distinguished patients with SJIA and infection. Distinguishing these two groups remains an important goal of research and therefore this study could help inform future prospective studies.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.6621

THU0572 ORGANISED SPORTS IN CHILDREN AND ADOLESCENTS WITH JUVENILE IDIOPATHIC ARTHRITIS (JIA): A COMPARISON OF PATIENT AND GENERAL POPULATION PARTICIPATION

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Background: Despite the well-established physical, social and mental health benefits of physical activity (PA) in childhood, a substantial proportion of children and adolescents with JIA seem to be not active enough to achieve their age-appropriate fitness level.¹ Previous research revealed that organised sports (OS)¹ is associated with greater health benefits compared to non-organised sporting activities, as intensity and net exercise duration are usually higher,² has a strong predictive value in improving leisure time PA, and³ has a positive influence on mental well-being and life satisfaction.²

Objectives: This study was aimed at comparing OS prevalence in JIA with the general population and at determining correlates associated with OS participation.

Methods: Data from the German National Paediatric Rheumatologic Database (NPRD) were considered for the analyses. The outcome variable 'OS participation' was analysed in patients aged 3 to 17 and compared to a population-based nationwide sample (German Health Interview and Examination Survey for Children and Adolescents; KIGGS). Correlates of OS participation were analysed using data of the year 2014.

Results: 5,056 children and adolescents with JIA (mean disease duration 4.5 ± 3.6 years) provided information about their exercise habits, of which 36% stated to be involved in OS (34% of girls, 41% of boys). The prevalence was higher in the age groups 7 to 10 and 11 to 13 years with almost 50% than in the age groups 3 to 6 and 14 to 17 years with 35% and 42%, respectively. In KIGGS participants, almost 60% reported to be physically active in OS (54% aged 3 to 6, 65% aged 7 to 10, 60% aged 11 to 13% and 49% aged 14 to 17). Non-participation in OS was associated with active disease status (cJADAS), functional disability (C-HAQ), low parental education, higher body mass index (BMI) and worse patient-reported pain, fatigue and overall well-being.

Conclusions: The prevalence of OS participation in JIA was considerably lower compared to the general population and varied with increasing age, parental education and functional ability. Considering that low levels of PA might even be more dangerous for young patients with JIA, as they also have signs of inflammation, it is all the more important to create opportunities and incentives in the future to improve young rheumatic's exercise habits.

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Acknowledgements: The National Paediatric Rheumatologic Database has been funded by the German Children Arthritis Foundation (Deutsche Kinder-Rheumastiftung), AbbVie, Pfizer and Chugai.

Disclosure of Interest: F. Milatz: None declared, M. Niewerth: None declared, N. Geisemeyer: None declared, R. Berendes: None declared, M. Hufnagel: None declared, N. Onken: None declared, A. Thon: None declared, F. Weller-Heinemann: None declared, K. Minden Grant/research support from: German Rheumastiftung, Pfizer, AbbVie, Roche, Speakers bureau: AbbVie, Medac, Pharm-Allergan

DOI: 10.1136/annrheumdis-2018-eular.5365