Conclusion: The least significant change in bone densitometry in patients with obesity is higher than in general population. These results may improve DXA interpretation in this specific population, and may personalize their medical care.

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Disclosure of Interests: None declared.

DOI: 10.1136/annrheumdis-2021-eular.3819

POS0046

MICRO-CT ANALYSIS OF SACROILIAC JOINT AS A NEW TOOL FOR STUDYING TRABECULAR BONE AND OSTEO-ARTICULAR LESIONS IN MURINE MODELS

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Background: Skeletal disorders affect the skeleton in different ways with some bones being very impaired while others less severely. In translational studies using murine models of human disorders, the bone phenotype is mainly evaluated at distal femur or proximal tibia. The sacroiliac joint (SIJ), which connects the spine to the pelvis, is involved in the balanced transfer of mechanical energy from the lumbar spine to the lower extremities. Its role in biomechanical stress makes it of particular interest in various bone diseases. For instance, patients with X-linked hypophosphatemia (XLH), who mainly display osteomalacia, are frequently affected with early osteoarthritis of the SIJ. Interestingly, we recently showed that the *Hyp* mouse, a murine model of XLH that greatly mimics the human disorder, displayed early and severe osteoarticular alterations of the SIJ [1].

Objectives: Here, using the *Hyp* mouse as a model, we show that the SIJ constitutes a highly reliable joint to investigate in murine models of skeletal disorders.

Methods: SIJ and distal femur were evaluated in 3-month-old *Hyp* mice compared to wild-type (WT) mice (n=10 per group). using high-resolution microCT. Measurements of trabecular and cortical bone parameters at sacral and iliac sides and trabecular bone parameters at distal femur were performed with the CTAnalyzer software.

Results: *Hyp* mice displayed a significant reduction in parameters of trabecular bone at distal femur, compared to WT mice (Figure 1A). Similarly, a reduction in trabecular bone was shown in *Hyp* SIJ compared to WT at sacral side (Figure 1B). There was a significant positive correlation between trabecular bone parameters of distal femur and sacral side of SIJ in *Hyp* mice (e.g. bone volume to total volume [BV/TV]: $r = 0.763$ $p < 0.01$). Bone parameters such as sacral BV/TV were higher in comparison to femoral parameters (Figure 1C). No difference was observed on trabecular bone parameters at iliac side of *Hyp* and WT mice. However, regarding the cortical bone of SIJ, significant alterations were noticed especially at iliac side of SIJ in *Hyp* mice compared to WT mice. An increase in open cortical porosity, and a decrease in cortical area fraction, as well as in average cortical thickness at iliac side of SIJ in *Hyp* mice were suggestive of osteo-articular lesions, characteristic for XLH.

Conclusion: Trabecular bone parameters at the SIJ, in comparison to the femur, appear to be a relevant alternative to evaluate bone alterations in *Hyp* mice. Our

study suggests that the SIJ represents a valuable tool to investigate both bone and local osteo-articular alterations for murine models of skeletal disorders.

Figure 1. A) Bone to total volume ratio in the trabecular bone of distal femur, expressed in percent. B) Bone to total volume ratio in the trabecular bone of sacral slope of the SIJ, expressed in percent. C) Bone to total volume ratio in the trabecular bone of distal femur and sacral slope of the SIJ of *Hyp* mice, expressed in percent. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; ****: $p < 0.0001$.

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Disclosure of Interests: None declared.

DOI: 10.1136/annrheumdis-2021-eular.3881

New Developments in COVID research

POS0047

OUTCOMES IN INFLAMMATORY ARTHROPATHY PATIENTS HOSPITALIZED FOR COVID-19

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Background: Covid 19 is a new and rapidly spreading corona virus which has reached pandemic proportions. As of 5/22/20 there are 5.08 million confirmed cases and 332,000 deaths worldwide. Primary manifestations are respiratory, with a subset developing severe hypoxic respiratory failure. Several risk factors predispose patients to worse outcomes including age, obesity, hypertension, chronic kidney disease, COPD, asthma, CHF, and diabetes. This is a retrospective cohort analysis of patients with Rheumatoid arthritis, Ankylosing spondylitis, or Psoriatic arthritis who were hospitalized for COVID-19 infection across 165 HCA hospitals from 1/1/2020 to 5/30/2020. We compared endpoints and calculated odds of ICU admission, invasive ventilation, mortality compared to control as well as length of stay and discharge location.

Objectives: Our objectives include measuring the outcome of Patients in two arms, the first being those with Rheumatoid arthritis, Ankylosing spondylitis, and Psoriatic arthritis who are infected with COVID 19 to an age matched and comorbidity matched arm (using the Charlson comorbidity index) for the composite endpoint of ICU admission, invasive ventilation, and death. We believe the inflammatory arthropathy arm will have a worse composite endpoint than the control arm. We will also attempt to calculate a hazard ratio of this arm vs the control to the composite endpoint. We will also examine the length of stay as well as inflammatory markers mentioned in between the two arms. We suspect initial inflammatory markers will be lower in the inflammatory arthropathy arm, particularly CRP and LDH, due to chronic immune modulating medication and these markers will not correlate as closely with severe illness represented by the composite endpoint as in the control arm.

Methods: We analyzed 86,217 patients admitted with COVID-19 comparing 751 patients who had inflammatory arthropathy to patients who did not. T tests were used for parametric outcome and chi square tests for non-parametric outcomes. Multivariate analysis included potential confounders such as age, and comorbidities such as diabetes, heart disease, etc.

Results: The odds ratio for mortality in the arthropathy arm was 1.37 with a confidence interval of 1.09 to 1.71 with a p value of 0.006. The odds ratio for ventilation was 1.35 with CI of 1.09 to 1.67 and p value of 0.006. The odds ratio of ICU admission was 1.46 with CI of 1.24 to 1.72 and P value of 0.000. The average length of stay of the arthropathy arm was 8.51 days +/- 10.02 vs 4.59 days +/- 8.26 of the control, $p < 0.001$. The discharge disposition of the arthropathy arm vs control group is as follows, 13.32% died inpatient vs 5.87% in the control, 56.72% were discharged home vs 77.19%, 6.79% went to hospice care vs 3.10%, 4.79% remained inpatient at the end of the study interval vs 3.45%, 17.18% were discharged to rehab vs 8.43%, and other discharges not included in the above groupings were 1.2% vs 1.96%, $p < 0.001$. 31.29% of the arthropathy

group required ICU admission vs 16.32% and 13.98% required ventilation vs 6.9%, $p < 0.001$. The average age was higher in the arthropathy arm vs control at 66.56 years old vs 51.53, $p < 0.001$. Charlson comorbidity index was also higher in the arthropathy arm at 2.72 vs 0.96, $p < 0.001$.

Conclusion: This is a large analysis of inflammatory arthropathy patients hospitalized with COVID-19. While the arthropathy group was older, and had more co-morbidities, when adjusting for potential confounders, inflammatory arthropathy patients had a higher risk of death and mechanical ventilation, as well as longer length of stay.

Disclosure of Interests: None declared.

DOI: 10.1136/annrheumdis-2021-eular.482

POS0048

SEROPREVALENCE OF ANTI-SARS-COV-2 ANTIBODIES IN RHEUMATIC PATIENTS TREATED WITH BIOLOGICAL AND TARGETED THERAPY LIVING IN LOMBARDY, ITALY (MAINSTREAM PROJECT)

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Background: Emerging observational data have shown that rheumatic patients seem not to be more susceptible to SARS-CoV-2 infection neither to worse outcomes. However, the true prevalence of COVID19 is still unknown due to the high proportion of subclinical infection. In this scenario, measuring the seroprevalence of SARS-CoV-2 may be crucial to improve the knowledge about the impact of COVID19 in rheumatic patients.

Objectives: To estimate in a COVID19 high-endemic area (Lombardy, Italy) the prevalence of anti-SARS-CoV-2 antibodies in a large cohort of patients with rheumatoid arthritis (RA) or spondyloarthritis (SpA) treated with biologic (b-) or targeted synthetic (ts-) disease modifying drugs (DMARDs).

Methods: A seroprevalence cross-sectional study was conducted in the period between 4th May and 16th June 2020, including patients with confirmed RA or SpA treated with b- or tsDMARDs. Patients were tested for anti-SARS-CoV-2 IgG, IgM and IgA antibodies against main viral antigens (nucleoprotein [N], spike 1 [S1], receptor-binding domain [RBD]) using ELISA. These data were compared with those observed in the healthy population in the same period and region. Patients also answered a questionnaire on history of symptoms consistent with COVID19, risk factors and comorbidities. Serological response to RBD was evaluated according to symptom severity (asymptomatic, minor, or major [respiratory and fever $>37.5^{\circ}\text{C}$] symptoms).

Results: The study population included 300 patients (62% females, mean age 53 years, 20% over 65 years old) diagnosed with RA (56%), psoriatic arthritis (23%), or ankylosing spondylitis (21%), treated with anti-TNF (57%), abatacept (20%), anti-IL6 (11%), or JAK inhibitors (5%). Four patients (1.3%) referred a prior diagnosis of COVID19 defined by nasopharyngeal swab. Immunoglobulin titers were evaluated resulting in 9%, 13.6%, and 13.3% positive patients for IgG, IgM and IgA, respectively (Table 1), with no significant difference to the healthy population. Among seropositive patients, 55.3% were asymptomatic, 16% had minor and 19.6% major symptoms, 7.1% were hospitalized. No deaths or admission to intensive care units occurred. IgM, IgG and IgA titers to RBD were higher in patients with both minor and major symptoms compared with asymptomatic ones (Figure 1). No differences were found between seronegative and seropositive patients in relation to age, sex, rheumatic diagnosis, and treatments with b- or tsDMARDs. A relative lower risk of seropositivity was observed in patients receiving concomitant methotrexate (RR 0.49, 95% CI 0.25-0.94; p 0.04), while an increased risk was associated with obesity (RR 2.33, 95% CI 1.26-3.79; p 0.019) and presence of at least 2 comorbidities (RR 1.94, 95% CI 1.11-3.15; p 0.037). Corticosteroids use was numerically more frequent in seropositive than seronegative patients (18% vs 14%).

Conclusion: This study confirms that, even in a cohort of rheumatic patients, the spread of SARS-CoV-2 infection is much greater than that observed by capturing only swab-diagnosed COVID19 cases. The underlying rheumatic disease and ongoing therapy with b/ts-DMARDs do not seem to impact SARS-CoV-2 antibody positivity, which conversely seems to be proportional to the intensity of COVID19 symptoms and less frequent in patients receiving concomitant methotrexate. The project was co-financed by Lombardy Region 2014-2020 Regional Operational Programme under the European Regional Development Fund.

Table 1. Prevalence of specific anti-SARS-CoV-2 antibodies.

Antibodies	Positive(n)	Seroprevalence (%)	(95% CI)
IgG	27	9%	(6.2 – 12.7)
IgG anti-N	26	8.6%	(5.9 – 12.3)
IgG anti-RBD	20	6.6%	(4.3 – 10)
IgG anti-S1	18	6%	(3.8 – 9.2)
IgM	41	13.6%	(10.2 – 18)
IgM anti-N	35	11.6%	(8.5 – 15.7)
IgM anti-RBD	25	8.3%	(5.7 – 12)
IgA	40	13.3%	(9.9 – 17.6)
IgA anti-N	37	12.3%	(9.0 – 16.5)
IgA anti-RBD	25	8.3%	(5.7 – 12)
IgG+IgM	23	7.6%	(5.1 – 11.2)
IgG+IgM+IgA	22	7.3%	(4.9 – 10.5)
IgG+IgA	24	8%	(5.4 – 11.6)
IgG/IgM/IgA	56	18.6%	(14.6 – 23.4)

Figure 1. Antibody levels (S/Co) against SARS-CoV-2 RBD.

Disclosure of Interests: None declared.

DOI: 10.1136/annrheumdis-2021-eular.594

POS0049

SARS-COV-2 INFECTION IN CHILDREN WITH RHEUMATIC DISEASE: EXPERIENCE OF A TERTIARY REFERRAL CENTER

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Background: Patients with rheumatic diseases are considered at risk for serious infections due to their immune-compromised-status set in their primary systemic disease and the usage of immune-modulating therapies. Although various results have been reported on the subject, it is still unknown whether patients with rheumatic disease, many of whom are on immune-suppression, are at higher risk of severe COVID-19.

Objectives: We aim to share our clinical SARS-CoV-2 experience in patient with the childhood rheumatic disease during pandemic.

Methods: We evaluated 4470 patients at our pediatric-rheumatology clinic during the pandemic, from 11-March to 15-October-2020. Demographic and clinical features, treatments, laboratory results, imaging findings, and clinical outcomes of patients diagnosed with COVID-19 and/or multisystem inflammatory syndrome (MIS-C) were review from the medical records. The data of all these patients were compared between groups and presented. A p-value <0.05 was considered statistically significant.

Results: Among 4470 patients, 87 COVID-19 suspected patients were included in the study. Fifty six (64.4%) patients were hospitalized and 31 were followed without hospitalization. The most common rheumatic diseases among them were juvenile idiopathic arthritis and familial Mediterranean fever (35.6% and 34.5%). The primary disease status of these patients were; 78 (89.6%) were in remission, while 9 (10.3%) had active disease at the time of COVID-19 diagnosis. Twenty six of these patients were treated with biologic DMARDs. SARS-CoV-2 infection (RT-PCR and/or antibody test) was found positive in 84 patients (96.5%). Also, fifty one (58.6%) patients had an epidemiologic contact to a person with COVID-19. Fifty six of 87 (64.3%) had a fever and 20 (23%) had a fever for five or more days. Gastrointestinal system involvement was in 11 (12.6%), the respiratory system was in 40 (46%) and fatigue was in 57 (65.5%) patients. Cutaneous involvement was seen in 5 patients including maculopapular rash in two, vasculitic rash in two, and chilblain in one patient. 63.2% of patients had increased C-reactive protein (CRP), 40.2% had lymphocytopenia ($<1500/\text{mm}^3$) and 26.4 % had elevated D-dimer