0.0001 and $r = 0.728$, $p < 0.0001$, respectively). ACPA and RF positive patients did not have higher FRAX scores (including or not BMD). Patients with erosive disease had a higher 10-year probability of major fracture evaluated by FRAX when it includes BMD ($p=0.041$).

Conclusion: It is very important to accurately assess the risk of osteoporotic fractures in RA patients to treat them properly. The authors highlight the high number of patients who are not receiving treatment according to FRAX categorization. In spite of the correlation between estimated fracture risk by FRAX with and without BMD, there is a discordance in fracture risk categorization, as one fifth of patients of low risk were reclassified as high risk. For the RA population treated with bDMARDs, our findings raise the need to request a DXA not only for patients classified as having an intermediate risk of fracture, but also for low-risk patients.

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SAT0483

SAFETY OF INTRAVENOUS IBANDRONIC ACID IN CHRONIC KIDNEY DISEASE: A REAL WORLD EXPERIENCE

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Background: Common forms of intravenous bisphosphonate used at the Royal Derby Hospital are zoledronic acid and ibandronic acid for a variety of indications. In the treatment of osteoporosis, zoledronic acid is preferred due to its convenience of once-yearly dosing; compared to ibandronic acid which is given three-monthly. Zoledronic acid is contraindicated in patients with an estimated glomerular filtration rate (eGFR) of less than 35 due to nephrotoxicity concerns. Ibandronic acid, however, is generally offered with an eGFR of 30 or over and is perceived to be a safer choice in more advanced chronic kidney disease. The potential of extending the use of ibandronic acid to patients with lower eGFR is being explored. However, there is a paucity of real world data and this study will therefore seek to affirm the safety profile in those on treatment.

Objectives: Establish the safety profile of IV ibandronic acid with regards to worsening renal function or significant hypocalcaemia injury in the context of reduced renal clearance.

Methods: The details of patients receiving IV ibandronic acid at Royal Derby Hospital were retrieved from the osteoporosis department register in September 2019. Data was collected anonymously from records using the electronic prescribing and pathology hospital database, together with electronic letters. The first three pre-infusion serum adjusted calcium levels, vitamin D, creatinine and eGFR were recorded. In addition, results from initiation to present were screened for any episodes of hypocalcaemia, acute kidney injury (AKI) or significant decline in renal function.

Results: Treatment duration ranged from 6 months to 6 years. Female:male ratio was 9:1 and the average age was 75 years (range 50-90). Baseline eGFR ranged from 27 to over 60; 3 patients had eGFR ≥ 60 , 2 had eGFR 27 while remaining patients (75%) had eGFR 30-59. All patients received a standard 3mg infusion on each occasion. The most common rationale cited for ibandronic acid choice as opposed to zoledronic acid was reduced creatinine clearance or eGFR. Three patients (15%) developed one or more episodes of mild hypocalcaemia (lowest 2.01 mmol/l). No episodes of hypocalcaemia were identified in the first three pre-infusion levels. Four patients (25%) had a decline in eGFR by more than 5 ml/min/1.73m² but there was no definitive causal link with ibandronic acid and was most commonly felt to be related to their underlying renal disease. Three patients (15%) had at least one episode of AKI since commencing treatment, each explained by an intercurrent illness. Serum Vitamin D levels were measured pre-infusion in 92% of cases.

Conclusion: This study reaffirms the safety profile of ibandronic acid use in renal function as low as CKD Stage 3b (≥ 30 ml/min/1.73m²). No episodes of AKI or sustained decline in renal function were causally linked to ibandronic acid.

References: Royal Derby Hospital Proposed Clinical Guideline (2019) – Use of ibandronic acid in CKD 4 at reduced dosage.

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SAT0484

TRABECULAR BONE SCORE IN SYSTEMIC LUPUS ERYTHEMATOSUS PATIENTS

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Background: Systemic lupus erythematosus (SLE) patients shown an increased risk of low bone mass as a result of multifactorial events: physical inactivity, persistent inflammation, low vitamin D levels (photosensitivity) and glucocorticoid treatment. Trabecular Bone Score (TBS), is an index extracted from the dual-energy X-ray absorptiometry (DXA) that provides an indirect measurement of bone axial microarchitecture and allows to get information about bone quality in several rheumatic diseases (1-4).

Objectives: The aims of this study were to examine the prevalence and risk factors for low bone mineral density (BMD) (osteoporosis or osteopenia) in female patients affected by SLE and to compare with matched healthy subjects (CNT).

Methods: 70 female patients (mean age 41 ± 20 years) affected by SLE and 65 age-matched CNT (mean age 46 ± 7 years) were enrolled. Bone Mineral Density (BMD, g/cm²) of the lumbar spine (L1-L4) was analyzed using a DXA scan (GE, Lunar Prodigy). Lumbar spine TBS was derived for each spine DXA examination using the TBS index (TBS iNsight Medimaps).

Results: The mean BMD $\pm$ SD was 0.47 ± 0.57 g/cm² at the lumbar spine and 0.78 ± 0.22 g/cm² at the hip in SLE patients. The prevalence of osteopenia was 40.0% and was 19.4% of osteoporosis in SLE patients. Most of SLE patients (75%) presented a bone loss that was significantly higher when compared with control group ($p < 0.001$). Lumbar spine TBS score was found significantly lower in SLE patients compared with CNT (0.687 ± 0.675 vs. 1.294 ± 0.809 $p < 0.001$, respectively) and of 0.47 ± 0.94 times lower than expected from the concomitant reference BMD value.

Conclusion: The study shows that the further TBS analysis, independently from the concomitant BMD value, is significantly lower than expected in SLE patients. The detection of the TBS, together with the BMD, may offer a more reliable indication of the real whole bone condition in chronic and systemic inflammatory rheumatic diseases, such as SLE.

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SAT0485

PERCENTAGE BODY FAT HAS A STRONGER ASSOCIATION WITH BONE MINERAL DENSITY AT THE HIP AND SPINE COMPARED TO BODY MASS INDEX

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Background: A decreased body mass index (BMI) is associated with poorer bone health, a decreased bone mineral density (BMD), and an increased fracture risk. Cardiovascular (CVS) data has shown that the waist:hip ratio is a more robust measurement for CVS outcomes than BMI (1). Waist:hip ratio has never been evaluated as an outcome measure for bone health. Dual-energy x-ray absorptiometry (DEXA) has the capacity to measure average percentage fat in the L1-L4 region and at the hip, and directly relates to the measurement of waist:hip ratio.

Objectives: To evaluate the relationship between BMD and average percent fat in a cohort referred for DEXA scanning.

Methods: We analysed data routinely collected from patients referred for DEXA between 2004 and 2010 at the Royal Lancaster Infirmary in the North of England. Data collected for these patients included DEXA scans

of BMD at the left and right hip, and at the lumbar spine, as well as average percent fat and other risk factors for osteoporosis, including the FRAX risk factors. We used only the measures collected at baseline (time of first scan). We modelled the T scores of the BMD measurements using a linear regression model including percentage fat and BMI as explanatory variables, and adjusting for gender, age at scan, and other known risk factors for osteoporosis, including the FRAX risk factors. BMI and average percent fat were standardised.

Results: The number of patients included was 33037, (82% female). Results of both regression models are shown in table 1 below. We show the standardised effect size estimates for average percent fat and BMI.

Anatomical location	Effect size estimate for average percent fat (95% confidence intervals)	P value	Effect size estimate for BMI (95% confidence intervals)	P value
Left neck	-0.156 (-0.171, -0.141)	<0.001	-0.0255 (-0.0441, -0.00701)	0.00692
Left total	-0.225 (-0.241, -0.208)	<0.001	-0.0680 (-0.0882, -0.0477)	<0.001
Left Ward's	-0.181 (-0.196, -0.166)	<0.001	-0.0268 (-0.0456, -0.00813)	0.00493
Left trochanter	-0.263 (-0.281, -0.246)	<0.001	-0.0667 (-0.0882, -0.0451)	<0.001
Right neck	-0.139 (-0.154, -0.124)	<0.001	-0.0131 (-0.0317, 0.00549)	0.167
Right total	-0.221 (-0.237, -0.204)	<0.001	-0.0611 (-0.0811, -0.0411)	<0.001
Right Ward's	-0.180 (-0.196, -0.165)	<0.001	-0.0193 (-0.0381, -0.000586)	0.0433
Right trochanter	-0.261 (-0.278, -0.243)	<0.001	-0.0598 (-0.0810, -0.0386)	<0.001
Spine (averaged L1-L4)	0.219 (0.195, 0.242)	<0.001	-0.00846 (-0.0379, 0.0206)	0.563

Conclusion: The analysis shows that average percent fat is a statistically significant predictor for BMD at different anatomical locations, and a larger predictor in comparison to BMI when evaluated in the same model. In the right hip neck and the spine, BMI was not predictive of changes in BMD. Higher average percent fat increases the BMD in the spine, compared to a decline at the hip. Further research is needed to characterise the relationship more precisely and identify whether there is a causal link.

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SAT0486

BONE MINERAL DENSITY IN PATIENT WITH SHRUNKEN PORE SYNDROME IS SIGNIFICANTLY LOWER THAN THAT IN PATIENT WITHOUT, HOWEVER SERUM PARATHYROID HORMONE DOES NOT CORRELATED MUCH WITH IT

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Background: Shrunken pore syndrome (SPS), defined by cystatin C (CysC) based estimated glomerular filtration rate ($eGFR_{CysC}$) < 60% of creatinine (Cr) based $eGFR$ ($eGFR_{Cr}$) in the absence of extrarenal influences on the plasma levels of CysC or Cr, is associated with a higher increase in mortality. SPS often causes reduced bone mineral density (BMD).

Objectives: In this study, relationship between BMD and SPS was investigated.

Methods: Patient with rheumatic diseases who were measured BMD with dual-energy X-ray absorptiometry and at the same time, CysC and Cr were also measured, were picked up. $eGFR_{CysC}$ and $eGFR_{Cr}$ were calculated, and a patient group with SPS were recruited. Relationship between serum PTH and CysC, or Cr was evaluated with univariate linear regression analysis. Between the SPS groups and the other patient group, statistical difference was evaluated regarding sex, age, Cr, CysC, serum Cr/CysC ratio (Cr/CysC), serum calcium corrected with albumin (Ca), creatinine phosphokinase (CPK), parathyroid hormone (PTH), $eGFR_{CysC}$, $eGFR_{Cr}$, BMD in the lumbar spine (BMD_LS) and femoral neck (BMD_FN) were evaluated with Mann-Whitney U-test. Relationship between BMD for each bone and sex, age, CPK, PTH, Cr/CysC, $eGFR_{CysC}$ and being SPS was statistically evaluated with multivariate linear regression analysis. Further, sensitivity and specificity regarding being SPS for T-score < -2.5, that is defined as diagnosis criteria of osteoporosis calculated from BMD, was evaluated with chi square test.

Results: A total of 819 participants with 75 males and 744 females joined. Patient with SPS counted 31 and without SPS counted 782. Underlying diseases are shown in Table 1. Average age, CysC, Cr, PTH, $eGFR_{Cr}$, and $eGFR_{CysC}$ were 76.5, 1.18, 0.76, 42.1, 66.2 and 59.0, respectively. PTH significantly correlated with CyC (p=0.015), but not correlated with Cr (p=0.079). SPS demonstrated significantly higher ratio for being male (P<1.0x10⁻¹⁰), higher age (p=1.07x10⁻³), higher titer of CysC (p=5.5x10⁻¹⁰), lower titer of CPK (p=1.5x10⁻⁴), lower Cr/CysC (P<1.0x10⁻¹⁰), lower $eGFR_{CysC}$ (p=2.8x10⁻⁷), BMD_LS (P<1.0x10⁻¹⁰) and BMD_FN (P<1.0x10⁻¹⁰), however no significant difference demonstrated for Cr (2.4x10⁻¹), PTH (p=1.7x10⁻¹) and Ca (p=6.3x10⁻¹). BMD_LS demonstrated significant positive correlation with CPK (p=2.6x10⁻⁴), and negative correlation with being female (p=4.9x10⁻⁷), age (p=2.1x10⁻³), PTH (p=2.2x10⁻²), $eGFR_{CysC}$ (p=2.5x10⁻⁹) and being SPS (p=4.9x10⁻³), while BMD_FN demonstrated significant positive correlation with Cr/CysC (p=7.3x10⁻⁴), and negative correlation with being female (p=1.5x10⁻⁶), age (p=4.9x10⁻⁸) and being SPS (7.3x10⁻³). Sensitivity and specificity of T-score < -2.5 in the LS regarding SPS was 50.0% and 74.0% (p=6.9x10⁻³), while in the FN 67.9% and 61.7% (p=1.7x10⁻³), respectively.

Table 1. Number of patients who were picked up in the study
Abbreviations: RA, rheumatoid arthritis; PsA, psoriatic arthritis; AJA, Sjoren Syndrome; SLE, systemic lupus erythematosus; PPP, pustulosis palmaris et plantaris; AS, ankylosing spondylitis; SSc, systemic sclerosis; UA, ulcerative colitis; PM/DM, polymyositis/dermatomyositis; MCTD, mixed connective tissue disease; FMF, Familial Medditeranean fever; PAN, polyarteritis nodosa.

Diseases	Number of patient
RA	512
PsA	110
SJS	67
SLE	66
PPP	17
AS	16
SSc	13
UA	11
Behcet	8
PM/DM	3
MCTD	2
FMF	2
PAN	1
total	828

Conclusion: These results suggested that SPS has serious potential risk of osteoporosis. BMD_LS loss may correlate elevation of PTH due to filtration disorder, however BMD_FN loss is not affected. Split of Cr and CysC is more important.

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SATURDAY, 06 JUNE 2020

Basic and translational science in paediatric rheumatology

SAT0487

PREDICTIVE BIOMARKERS OF IGA VASCULITIS WITH NEPHRITIS BY METABOLOMIC ANALYSIS

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Background: IgA vasculitis/ Henoch Schönlein Purpura (IgAV/HSP) is the most common vasculitis of childhood and renal involvement is the most serious long-term complication. A better understanding of the pathophysiology of the progression to kidney disease is required for better treatment to be achieved and current biomarkers of Ig A vasculitis with nephritis (IgAVN) lack the predictive value.

Objectives: In this study, an untargeted metabolomics approach was performed to reveal the underlying molecular mechanism of disease pathogenesis and to find potential biomarkers of plasma samples from patients with IgAV and IgAVN.

Methods: IgAV/HSP was diagnosed according to the Ankara criteria in 2008 (1). Forty-five patients, including 39 active IgAV patients (H), 6 IgAVN (N), and 6 age- and