Most patients were woman (83.5%) with a mean age of 70.7 (SD=11.2) years-old at the time of their wrist fracture. A previous FF was seen in 22.9% of patients and 13.3% had a new FF during the follow-up period.

We found an association between the occurrence of a new FF and the number of comorbidities ($p=0.012$), number of visits to the ED due to falls ($p<0.001$), previous diagnosis of chronic pulmonary disease ($p=0.029$) and hematologic pathologies ($p=0.047$), and the need for hospitalization at time of the wrist FF ($p=0.018$). No associations were found between the age at the wrist fracture time, number of drugs taken daily nor its type (anxiolytics, antiepileptics, corticoids), previous fractures (and localization), overweight/obesity and other cardiovascular risk factors, endocrinopathies, psychiatric or neurologic disease or other comorbidities. After adjustment for age, gender, anti-osteoporotic treatment and comorbidities, the main predictors of a new FF were visits to the ED for falls ($p=0.005$), chronic pulmonary disease ($p=0.040$), hematologic pathologies ($p=0.004$) and need for hospitalization ($p=0.040$) (table 1).

Table 1. Multivariate analyses: linear multiple regression for predictive factors of new fragility fracture.

Determinants	Unstandardized Coefficients B	Standardized Coefficients Beta	95.0% CI	p-value
Age	-0.025	0.975	0.924 – 1.030	NS
Gender	2.065	7.889	0.757 – 82.165	NS
Number of comorbidities	0.186	1.204	0.846 – 1.713	NS
Visits to the emergency service for falls	-2.136	0.118	0.026 – 0.529	0.005
Chronic pulmonary disease	-1.326	0.266	0.075 – 0.940	0.040
Hematologic pathologies	-4.296	0.014	0.001 – 0.255	0.004
Need for hospitalization	-2.764	0.063	0.004 – 0.887	0.040
Anti-osteoporotic treatment	0.157	1.170	0.227 – 6.017	NS

CI: Confidence Interval; NS: non-significant;

Conclusion: Certain comorbidities seem to be associated with new FF. Patients with visits to the emergency service after falls and those who needed hospitalization due to the wrist fracture were more prone to have a new FF. There might be a substantial missed opportunity for intervention in these patients.

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POS0163

INCIDENT FRACTURE RISK PREDICTION USING THE FRAGILITY SCORE CALCULATED BY LUMBAR SPINE RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS) SCANS

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Background: The main consequence of osteoporosis is the occurrence of fractures due to bone fragility, with important sequelae in terms of disability and mortality. It has been already demonstrated that the information about bone mass density (BMD) alone is not sufficient to predict the risk of fragility fractures, since several fractures occur in patients with normal BMD [1].

The Fragility Score is a parameter that allows to estimate skeletal fragility thanks to a trans-abdominal ultrasound scan performed with Radiofrequency Echographic Multi Spectrometry (REMS) technology. It is calculated by comparing the results of the spectral analysis of the patient's raw ultrasound signals with reference models representative of fragile and non-fragile bones [2]. It is a dimensionless parameter, which can vary from 0 to 100, in proportion to the degree of fragility, independently from BMD.

Objectives: This study aims to evaluate the effectiveness of Fragility Score, measured during a bone densitometry exam performed with REMS technology at lumbar spine, in identifying patients at risk of incident osteoporotic fractures at a follow-up period of 5 years.

Methods: Caucasian women with age between 30 and 90 were scanned with spinal REMS and DXA. The incidence of osteoporotic fractures was assessed during a follow-up period of 5 years. The ability of the Fragility Score to discriminate between patients with and without incident fragility fractures was

subsequently evaluated and compared with the discriminatory ability of the T-score calculated with DXA and with REMS.

Results: Overall, 533 women (median age: 60 years; interquartile range [IQR]: 54-66 years) completed the follow-up (median 42 months; IQR: 35-56 months), during which 73 patients had sustained an incident fracture.

Both median REMS and DXA measured T-score values were significantly lower in fractured patients than for non-fractured ones, conversely, REMS Fragility Score was significantly higher (Table 1).

Table 1. Analysis of T-score values calculated with REMS and DXA and Fragility Score calculated with REMS. Median values and interquartile ranges (IQR) are reported. The p-value is derived from the Mann-Whitney test.

	Patients without incident fragility fracture	Patients with incident fragility fracture	p-value
T-score DXA [median (IQR)]	-1.9 (-2.7 to -1.0)	-2.6 (-3.3 to -1.7)	0.0001
T-score REMS [median (IQR)]	-2.0 (-2.8 to -1.1)	-2.7 (-3.5 to -1.9)	<0.0001
Fragility Score [median (IQR)]	29.9 (25.7 to 36.2)	53.0 (34.2 to 62.5)	<0.0001

By evaluating the capability to discriminate patients with/without fragility fractures, the Fragility Score obtained a value of the ROC area under the curve (AUC) of 0.80, higher than the AUC of the REMS T-score (0.66) and of the T-score DXA (0.64), and the difference was statistically significant (Figure 1).

Figure 1. ROC curve comparison of Fragility Score, REMS and DXA T-score values in the classification of patients with incident fragility fractures.

Furthermore, the correlation between the Fragility Score and the T-score values was low, with Pearson correlation coefficient $r=-0.19$ between Fragility Score and DXA T-score and -0.18 between the Fragility Score and the REMS T-score.

Conclusion: The Fragility Score was found to be an effective tool for the prediction of fracture risk in a population of Caucasian women, with performances superior to those of the T-score values. Therefore, this tool presents a high potential as an effective diagnostic tool for the early identification and subsequent early treatment of bone fragility.

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POS0164

THE NEED FOR ANTI-OSTEOPOROTIC INTERVENTION IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS BASED ON THE FRACTURE RISK ASSESSMENT

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Background: Rheumatoid arthritis (RA) is a chronic disabling disease that is associated with bone loss. Previous studies estimated that approximately

one-third of the RA patients had osteoporosis (OP). However, most fragility fractures occur in patients not suffering from OP, that can be partly explained by impaired quality of bone, which is not measured with DXA. Therefore, only the measurement of bone mineral density is not sufficient to determine the indication for OP treatment. Another tool for assessing the need for anti-osteoporotic therapy is to calculate the 10-year probability of a major fracture using the fracture risk assessment tool (FRAX).

Objectives: To assess the need for anti-osteoporotic therapy in women with rheumatoid arthritis (RA) based on the identification of individuals with fragility fractures and high risk of fracture according to FRAX.

Methods: 295 postmenopausal women with RA were included in the study. The average age was 63 ± 7 years, the duration of RA was 11 [4;16] years, the duration of postmenopausal period was 13 [6; 20] years. 121 (41%) patients took glucocorticoids (cumulative dose 9025 [3650; 20720] mg in prednisolone equivalent). A survey was conducted to identify patients with risk factors and a history of fragility fractures. The 10-year probability of a major osteoporotic fracture was assessed using the FRAX tool. In patients treated with glucocorticoids at a dose >7.5 mg in prednisolone equivalent the estimates of probabilities of a major osteoporotic fracture were adjusted in accordance with the recommendations [1]. Dual-energy X-ray absorptiometry (DXA) of the proximal femur was performed in patients with a moderate risk (probabilities between the upper and lower assessment age-dependent intervention threshold) and the risk of fracture was recalculated with including femoral neck BMD.

Results: 83 (28.1%) patients had a prior fragility fracture: 44 (14.9%) – 1, 20 (6.8%) – 2 and 19 (6.4%) – 3 or more. Vertebral fractures were the most common, they accounted for 62.1% of all fractures, distal forearm was the second frequent fractures localization (18.2%). Only 2 (0.7%) women had hip fracture. The average 10-year probability of a major osteoporotic fracture was 17 % [11; 28] in RA women. 92 (31.2%) persons were at high risk, 28 (9.5%) patients - at low risk, and 175 (59.3%) - at moderate risk. After recalculation of fracture risk with including femoral neck BMD in people at moderate risk 48 (16.3 %) patients became at high risk, 9 (3.1%) – at very high risk, and 118 (40.0%) - at low risk. Thus, 149 (50.5%) RA patients were at very high or high risk and 146 (49.5%) – at low risk of major osteoporotic fracture according to FRAX, among the last – only 3 persons had a history of fragility fracture after age of 40 years.

Conclusion: Our study demonstrated that a half of postmenopausal women with RA had indications for anti-osteoporotic treatment based on the results of a 10-year probability of major fragility fractures using FRAX tool.

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POS0165

STUDY OF VERTEBRAL AND FEMUR FRACTURE PREVALENCE AND SCANOGRAPHIC BONE ATTENUATION COEFFICIENT OF THE FIRST LUMBAR VERTEBRA IN AN ACADEMIC HOSPITAL SETTING

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Background: Patients with osteoporosis are prone to suffer fragility fractures leading to an increased risk of future fractures. Detection of osteoporosis has been led by dual energy-ray absorptiometry (DEXA) as the gold standard. However, in acute fracture incidents, DEXA imaging is typically unavailable, and treatment is often delayed. In recent years scanographic bone attenuation coefficient of the first lumbar vertebra (SBAC-L1) on incidental computed tomography (CT) scans of the lumbar spine has been utilized as an alternative assessment of bone density. In particular, SBAC-L1 ≤ 145 HU correlates with osteoporotic bone density on DEXA imaging.²

Objectives: This study aims to assess the SBAC-L1 in HU of incidental CT scans in patients presenting with vertebra or femur fragility fractures in an academic hospital as it relates to osteoporosis.

Methods: We conducted a retrospective chart review of patients aged ≥ 45 admitted to an academic hospital for active vertebral or femur fracture between 1/1/2017- 1/31/2019, excluding traumatic and pathological fractures. Measurement of SBAC-L1 in HU was obtained on incidental CT scan imaging. Sex, race, prior and post diagnoses of osteoporosis, prior and post DEXA scan orders, use of calcium, vitamin D, and steroids were abstracted.

Results: There were 297 patients with vertebral or femur fractures from 1/1/2017-1/31/2019. Of 297 patients, 85 deemed appropriate after excluding pathological, traumatic fractures, and lack of CT scan on the admission for fracture. Average SBAC-L1 for all patients was $100.4 \pm$ standard deviation (SD) of 46.5 HU. 82% of all patients had SBAC-L1 ≤ 145 HU. Caucasian patients had a lower

average SBAC-L1 [99.4 HU] than African American (AA) patients [122.1 HU]. More Caucasian [n=15] had prior diagnoses of osteoporosis than AA [n=2]. Caucasian patients were prescribed Calcium and Vitamin D more often [n=39] than AA [n=3]. DEXA scan orders were placed more often in Caucasian patients [n=4] than AA patients [n=1]. Osteoporosis medications were prescribed more often in Caucasian patients [n=8] than AA patients [n=0].

Male average SBAC-L1 was 97.4 HU compared to females at 106.3 HU. Females were prescribed calcium and vitamin D more often [n=38] than males [n=8]. DEXA scan orders were placed more frequently in females [n=5] than males [n=2]. Osteoporosis medications were prescribed more often in females [n=9] than male patients [n=0].

Table 1. Study Characteristics

	Total Patients [n=85]	Caucasian Patients [n=67]	AA Patients [n=16]	Male Patients [n=31]	Female Patients [n=54]
SBAC- L1 Average $\pm$ SD (HU)	100.4 $\pm$ 46.5	99.4 $\pm$ 44.1	122.1 $\pm$ 49.9	97.4 $\pm$ 44.3	106.3 $\pm$ 47.2
Patients with SBAC- L1 $\leq$ 145 HU	70	58	10	26	44
Patients with SBAC- L1 $>$ 145 HU	15	9	6	5	10
Vertebral Fractures	57	47	8	19	38
Femur Fractures	28	20	8	12	16
Age Average	71.7	72	70.9	74	70.4
Prior diagnosis of osteoporosis	16	15	1	2	14
Post diagnosis of osteoporosis	6	2	2	2	4
Calcium	20	16	2	2	18
Vitamin D	26	23	1	6	20
Osteoporosis medication	9	8	0	0	9
Steroid use	5	4	1	2	3
DEXA prior	13	12	1	0	13
DEXA after	7	4	1	2	5

Conclusion: 70 of 85 patients with incidental fragility fractures exhibited SBAC-L1 ≤ 145 HU. This is consistent with osteoporotic bone density on DEXA imaging supporting the use of SBAC-L1 measurement to corroborate the diagnosis osteoporosis. SBAC-L1 ≤ 145 HU can be utilized to increase inpatient diagnostic confidence of osteoporosis in the setting of acute fragility fractures to allow initiation of treatment prior to awaiting outpatient DEXA imaging.

The results here also highlight health disparities present among African Americans and males of all races when considering bone health.

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POS0166

ASSOCIATION OF TRABECULAR BONE SCORE AND FAT DISTRIBUTION IN MOROCCAN RHEUMATOID ARTHRITIS PATIENTS

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Background: The association between body composition and bone microarchitecture reflected by trabecular bone score (TBS) has been studied lately (1). In rheumatoid arthritis (RA), this association, especially with fat mass, needs further confirmation.

Objectives: The purpose of the present work was to study the association of TBS with fat distribution in RA.

Methods: We designed a cross-sectional study of patients with RA diagnosis according to ACR-EULAR 2010 classification recruited from first January 2021. Those with prior cancer, hyperparathyroidism, hyperthyroidism, diabetes, chronic kidney disease, cirrhosis, and a body mass index (BMI) of more than 36kg/m^2 were excluded. TBS, total body fat mass (BFM), and its distribution (gynoid (GFM), android (AFM), visceral (VFM), limbs (LFM), trunk (TFM)) were measured with Dual-energy X-ray absorptiometry (Hologic). Clinical data and laboratory tests of the same day of the DXA scan were analyzed. The associations between TBS, BFM, and its distribution were studied by correlations and multiple linear regressions using SPSS 20.

Results: Sixty-nine patients were included. Their mean age was 49.86 ± 14.33 years, mean DAS28CRP was 2.56 ± 1.27 , and mean disease duration was 14.84 ± 10.99 years. Sixty-two (89.9%) were women, with 30 (48.4%) had menopause. The mean BMI was $26.46 \pm 5.26\text{kg/m}^2$, and 41 patients were obese (59.4%).