

**Results:** Sixty-six samples were studied: mean age was 48.9 (+/- 9.7) and 68% were female. Mean duration of shoulder pain was 30 months with a mean VAS pain of 68/100 (+/-14). Mean calcification size was 1.8 cm. Results of ELISA were as follows: mean level of PEDF at 1097 pg/μg, mean level of OPG at 135 pg/μg, mean level of POSTN at 6.9 pg/μg, mean level of ACT A at 19.6 pg/μg and mean level of OPN at 49.6 pg/μg although BMP-2 was undetectable. There was no correlation between level of proteins and the size of the calcification or the duration of pain. There was no difference in protein levels between type A and type B calcifications on radiography (classification of the French Society for Arthroscopy). In contrast, levels of POSTN and OPN were significantly higher in nodular calcifications compared to the homogenous (p=0.003 and p=0.01 respectively) or fragmented types (p=0.03 and p=0.04 respectively). Furthermore, calcifications without acoustic shadowing were enriched in POSTN compared to those with (p=0.04). Finally, the periostin level was significantly higher in calcifications that have responded well to UGPL (p=0.02).

**Conclusion:** In this cohort of patients treated by UGPL, we observed higher levels of POSTN and OPN in the less dense calcifications and POSTN enrichment appeared to be associated with a better response to UGPL. Considering these data, further studies will be necessary to better understand the role of this protein in calcific tendonitis.

#### References:

- [1] Darrieuort-Laffite C, Varin S, Coiffier G, Albert JD, Planche L, Maugars Y, Cormier G, Le Goff B. Are Corticosteroid Injections Needed After Needling and Lavage of Calcific Tendinitis: A Randomized, Double-Blind, Non-Inferiority Trial. *Ann Rheum Dis.* 2019 Jun;78(6):837-843.

**Disclosure of Interests:** None declared

**DOI:** 10.1136/annrheumdis-2020-eular.2632

AB0925

#### MULTIPLE FRACTURES DUE TO IRON-INDUCED AND FGF23-MEDIATED HYPOPHOSPHATEMIC OSTEOMALACIA: AN UNKNOWN ADVERSE EFFECT

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**Background:** The use of a specific and widely used type of intravenous ferrotherapy, ferric carboxymaltose (FCM), has been linked to the development of an asymptomatic and transient hypophosphataemia. However, in recent years it has been published that it can generate a severe hypophosphataemic osteomalacia (HPO) mediated by fibroblast growth factor 23 (FGF23) that is associated with high morbidity<sup>1</sup>. It is a potentially serious adverse effect whose prevalence is unknown and that clinicians may know little about.

**Objectives:** To know the clinical and biochemical characteristics of this adverse effect and make it visible in the medical community.

**Methods:** Observational descriptive study of three cases of patients assessed in the Rheumatology department of our hospital who were referred for study of recurrent fractures and diagnosed of FGF23-mediated HPO due to FCM. Demographic, clinical and laboratory data of the patients are described.

**Results:** The clinical and laboratory characteristics of the patients are shown in table 1. All patients presented clinical and biochemical features compatible with FGF23-mediated HPO (mean of FGF levels 240 kRU/L, NR 0-145). All had multiple insufficiency fractures (Fx) and/or avascular necrosis (AN), with hip involvement in all 3 cases. Other causes of HPO were ruled out in all of them using PET <sup>18</sup>F-FDG, octreotide scintigraphy, abdominal magnetic resonance and PET <sup>68</sup>Ga-DOTATOC, and a genetic study of hypophosphataemic rickets was also performed in case 1. In all patients FCM was discontinued and phosphate levels were progressively normalized allowing the withdrawal of oral phosphate and calcitriol replacement therapy. After metabolic normalization, none presented new Fx or AN.

**Conclusion:** Treatment with FCM can cause severe FGF23-mediated HPO, multiple fractures and a great decrease in the quality of life. Since it can be potentially serious and easily reversible, it is important to favor the dissemination of these new cases and the knowledge of this disease. The need to monitor phosphate and/or FGF23 levels in patients receiving this intravenous iron therapy should be evaluated.

#### References:

- [1] Bishay RH, Ganda K, Seibel MJ. Long-term iron polymaltose infusions associated with hypophosphataemic osteomalacia: a report of two cases and review of the literature. *Ther Adv Endocrinol Metab.* 2017;8(1-2):14-19. doi:10.1177/2042018816678363

**Disclosure of Interests:** Elisa Fernández: None declared, Carolina Tornero: None declared, Victoria Navarro-Compán Consultant of: Abbvie, Lilly, Novartis, Pfizer, UCB, Speakers bureau: AbbVie, MSD, Lilly, Novartis, Pfizer, UCB, Gemma Bonilla: None declared, Chamaida Plasencia: None declared, Alejandro Balsa Grant/research support from: BMS, Roche, Consultant of: AbbVie, Gilead, Lilly, Pfizer, UCB, Sanofi, Sandoz, Speakers bureau: AbbVie,

**Table 1. Clinical and biochemical characteristics of the patients**

	Case 1	Case 2	Case 3
<b>Age (years)<sup>a</sup></b>	36	75	43
<b>Medical history</b>	Crohn's disease (CD), right hemicolectomy, CD-associated spondyloarthritis	Small bowel angiodysplasias	Antisintetase syndrome. Uterine fibroids.
<b>Cause of anemia</b>	Gastrointestinal bleeding and malabsorption	Gastrointestinal bleeding	Gynecological bleeding
<b>Fe-CBX start date</b>	10/2010	08/2013	02/2018
<b>Fe-CBX discontinuation date</b>	10/2018	11/2018	06/2018
<b>Total time Fe-CBX (months)</b>	96	63	4
<b>Fractures</b>	AN: left calcaneus posterior tuberosity, astragaline dome, right femoral head  Fx: left talus, tibial pylon, tibia-astragaline and ischiopubial branch; right 2nd metatarsal, distal tibia, posterior tuberosity of calcaneus	Fx both femoral necks and right sacral wing	AN both femoral heads
<b>Bone densitometry</b>	LS: Z-score -2.4 FN: Z-score -2.4		LS: Z-score -0.5 FN: Z-score -1.3
<b>Phosphate, mg/dL (NR 2.5-4.5)<sup>a</sup></b>	<b>1.8</b>	<b>1.6</b>	<b>1.3</b>
<b>Calcium, mg/dL (NR 8.6-10.2)<sup>a</sup></b>	9.1	8.3	9.0
<b>1,25(OH)<sub>2</sub>D<sub>3</sub>, ng/ml (NR 30-100)<sup>a</sup></b>	54	12	7
<b>PTH, pg/ml (NR 12-65)<sup>a</sup></b>	71	223	104
<b>AP, U/L (NR 46-116)<sup>a</sup></b>	113	140	86
<b>Ph-exc, mg/24h (NR 400-1300)<sup>a</sup></b>	1609	1630	489
<b>TPR, % (NR 73-87)<sup>a</sup></b>	<b>58.3</b>	<b>50.2</b>	<b>70.7</b>
<b>FGF-23, kRU/L (NR 0-145)<sup>a</sup></b>	<b>183</b>	<b>335</b>	<b>201</b>
<b>Time to normalization<sup>b</sup></b>	10	4	8

<sup>a</sup>During treatment with FCM. <sup>b</sup>Of serum phosphate levels since FCM discontinuation in months. LS: Lumbar spine. FN: Femoral neck. NR: Normality range. PTH: Parathyroid hormone. AP: Alkaline phosphatase. Ph-exc: 24-hour urine phosphate excretion. Ph-cl: phosphate clearance. TPR: Tubular phosphate reabsorption. Data highlighted in bold indicate altered values.

Lilly, Sanofi, Novartis, Pfizer, UCB, Roche, Nordic, Sandoz, Pilar Aguado: None declared

**DOI:** 10.1136/annrheumdis-2020-eular.5938

AB0926

#### PERFORMANCE OF THE ACR-EULAR GOUT CLASSIFICATION CRITERIA FOR THE DIAGNOSIS OF GOUT IN CLINICAL PRACTICE: A ONE-YEAR FOLLOW-UP STUDY

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**Background:** Classification criteria are used for classifying groups of patients, especially for clinical trials, and diagnostic criteria for diagnosis in individual patients.

**Objectives:** to establish the performance of the 2015 ACR/EULAR gout classification criteria for the diagnosis of gout in patients with undifferentiated arthritis. Secondary, to explore the use and efficacy of uric acid lowering therapy (ULT) in daily clinical practice in new gout patients.

**Methods:** 1-year follow-up study was performed in subjects with unclassified arthritis, who had been classified as gout patients or not, according to the gout classification criteria, including imaging with dual-energy CT, but without ultrasonography and joint X-rays. (1) The reference was the clinical diagnosis (gout yes/no) after 1-year follow-up.

**Results:** 71 patients were included; their demographic and clinical characteristics are summarized in Table 1. All 63/71 patients classified as having gout at baseline also had a clinical gout diagnosis after one year, and of the patients not classified, none had the clinical diagnosis of gout at one year.

**Table 1. Characteristics of the 71 subjects included in analyses**

	Diagnosis**	
	gout (n=63)	no gout (n=8)
Age in years, mean (SD)	62 (14)	59 (14)
Male gender, N (%)	53 (84)	5 (63)
Symptom duration* at baseline in months, median (IQR)	12 (1-48)	8 (0.5-33)
Joint involvement at baseline N patients (%):		
MTP,	33 (52)	1 (12)
ankle/midfoot	12 (19)	1 (12)
other joint	18 (29)	6 (76)
SUA intercritical in $\mu\text{mol/l}$ , mean (SD)	484 (63)	337 (71)
2015 ACR/EULAR criteria baseline score, mean (SD)***	10.3 (2.5)	2.6 (1.5)
2015 ACR/EULAR criteria $\geq 8$ points, N patients (%)***	57 (90)	0 (0)
MSU crystal positive joint aspiration, N patients (%)	44 (70)	0 (0)
DECT positive, N patients (%)	49 (78)	0 (0)

\* self-reported, intermittent symptoms; \*\* all patients classified with gout at baseline also had a clinical gout diagnosis after one year; \*\*\* using a somewhat limited set, see methods  
MTP, metatarsophalangeal joints; SUA, serum uric acid; DECT, dual-energy CT; MSU, monosodium urate.

Sensitivity, specificity, positive and negative predictive value, and accuracy values (95% CI) of the classification criteria set we used were 0.91 (0.80-0.96); 1 (0.63-1); 1; 0.57 (0.38-0.74) and 0.92 (0.83-0.97), respectively. The area under the receiver operating characteristics curve (95% CI) was 0.95 (0.91-0.99).

ULT was started in 49/63 (78%) of gout patients; 45/49 (92%) of them had serum uric acid levels  $\leq 360 \mu\text{mol/l}$  and no recurrent gout attack during one-year follow-up.

**Conclusion:** The 2015 ACR-EULAR gout classification criteria performed well for the diagnosis gout in clinical practice. Most gout patients had been treated successfully, according to current guidelines.

#### References:

[1] Gamala M, Jacobs JWG, Linn-Rasker SF, Nix M, Heggelman BGF, Pasker-de Jong PCM, et al. The performance of dual-energy CT in the classification criteria of gout: a prospective study in subjects with unclassified arthritis. *Rheumatology* 2019 Sep (Epub ahead print).

**Disclosure of Interests:** Mihaela Gamala: None declared, Johannes W. G. Jacobs Grant/research support from: Roche, Suzanne Linn-Rasker: None declared, Maarten Nix: None declared, Ben Heggelman: None declared, Pieter Pasker: None declared, Jacob M. van Laar Grant/research support from: MSD, Genentech, Consultant of: MSD, Roche, Pfizer, Eli Lilly, BMS, Ruth Klaasen: None declared

**DOI:** 10.1136/annrheumdis-2020-eular.2457

#### AB0927 HIGHER ULTRASOUND BURDEN WITH MONOSODIUM URATE CRYSTALS IN THE JOINTS IS CONNECTED TO MORE PRONOUNCED ARTERIOSCLEROTIC VASCULAR ALTERATIONS

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**Background:** The severity of gout and the presence of subcutaneous tophi increase the risk of cardiovascular death. In patients (pts) in the spectrum of gout and in subjects who have inflammatory arthritis with accompanying asymptomatic hyperuricemia, data whether ultrasound (US) burden with monosodium urate (MSU) crystals in the joints is associated with higher cardiovascular risk are contradictory.

**Objectives:** To establish the relationship between US MSU crystal deposits in the joints with diastolic heart function and carotid arteries alterations in gout pts, individuals with asymptomatic hyperuricemia and no sign of inflammatory arthritis and psoriatic arthritis pts with asymptomatic hyperuricemia.

**Methods:** The study is cross-sectional. A total of 121 consecutive pts were included, divided into 85 pts with gout - 63 males and 22 females aged 57.7 $\pm$ 14.1 years, 27 subjects with asymptomatic hyperuricemia and no sign of inflammatory arthritis - 13 males and 14 females aged 53.4 $\pm$ 17.2 years, and 9 psoriatic arthritis individuals with asymptomatic hyperuricemia - 2 males and 7 females aged 61.2 $\pm$ 14.4 years. Pts underwent two-dimensional echocardiography, US examination of the common carotid arteries and US of the joints of the hands, elbows, knees, ankles and feet. The echocardiography was conducted with 2.5 MHz transducer phased array working with pulse Doppler frequency of 2.5 MHz. Parameters of the transmitral blood flow were measured: the ratio between maximal early and late flow velocities (E/A ratio) and deceleration time (DT). With tissue Doppler imaging, early diastolic mitral annular velocity (e') was obtained. We judged for left ventricular filling pressure by determining E/e' ratio. Using US of the common carotid arteries done with 10 MHz linear transducer working

with pulse Doppler frequency of 5 MHz were measured: intima-media thickness (IMT), common carotid artery resistive index (CCARI) and the presence of atherosclerotic plaques was recorded. US of the joints was performed with a high-frequency, linear transducer, 4-15 MHz. The existence of double contour sign, intra-tendinous MSU aggregates, snow storm, tophi, tophi with erosions, or a combination of these US features was assessed. Data were analyzed by Chi-Square, Mann-Whitney, Kruskal Wallis, t-test and ANOVA.

**Results:** In the three groups there was no difference in the mean values of E/A ratio (p=0.591), DT (p=0.498), e' (p=0.662), E/e' ratio (p=0.754), IMT (p=0.260), CCARI (p=0.089) and in the frequency of heterogeneous or homogeneous carotid arteries plaques (p=0.595). Among pts with and without evidence of MSU crystals in the joints the means of E/A ratio (p=0.452), DT (p=0.367), e' (p=0.218), E/e' ratio (p=0.230), IMT (p=0.165), CCARI (p=0.097) and the frequency of heterogeneous or homogeneous plaques (p=0.830) were comparable. The distribution of MSU crystal deposits in two or more joints was the highest in gout pts (56.5%) compared to pts with asymptomatic hyperuricemia (11.1%) and individuals with psoriatic arthritis (22.2%), (p<0.001). Pts with MSU crystal deposits in two or more joints compared to those with crystal deposits in one joint and pts without MSU crystals had the highest CCARI (mean $\pm$ SD; 0.72 $\pm$ 0.05 vs 0.69 $\pm$ 0.07 vs 0.68 $\pm$ 0.07, p=0.019), the longest DT (mean $\pm$ SD; 236 $\pm$ 50.99 msec vs 208.09 $\pm$ 34.30 msec vs 216 $\pm$ 55.43 msec, p=0.026) and had a tendency of lowest e' (mean $\pm$ SD; 10.33 $\pm$ 3.96 cm/s vs 12.03 $\pm$ 3.83 cm/s vs 11.99 $\pm$ 3.98 cm/s, p=0.077), but the values of E/A ratio (p=0.119), E/e' ratio (p=0.107), IMT (p=0.151) and the distribution of atherosclerotic plaques (p=0.920) were equal.

**Conclusion:** Pts with higher US MSU burden have more pronounced left ventricular diastolic dysfunction and greater vascular stiffness. The changes in their vessels are mainly of the arteriosclerotic type.

**Disclosure of Interests:** None declared

**DOI:** 10.1136/annrheumdis-2020-eular.1328

#### AB0928 DISORDERS OF FATTY ACID METABOLISM IN THE FORMATION OF ARTERIAL HYPERTENSION IN PATIENTS WITH GOUT

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**Background:** One of the possible mechanisms of the formation of cardiovascular disorders in patients with gout may be a violation of the metabolism of fatty acids. Decrease of the total content of unsaturated fatty acids (UFAs) has a multifaceted adverse effect on a number of metabolic processes which lead to the development of arterial hypertension (AH) and atherosclerosis as a result. There are no studies on the level of UFAs in the blood of patients with gout depending on the presence of hypertension.

**Objectives:** To study the level of UFAs in the blood of patients with gout depending on the presence of AH.

**Methods:** We examined 87 patients with gout and AH. 83% were men (mean age 55.4  $\pm$  12.3 years). All patients had chronic gouty arthritis, 30% of patients had tofus. The duration of gout was 8 [4; 11] years. AH was detected in 49 (56.2%) people. The duration of AH was 7 [2; 10] years. All patients went through standard general clinical, laboratory and instrumental examination. Ozonation method was developed and put into practice in N.N. Semenov Federal Research Center for Chemical Physics, Russian Academy of Science (FRCCP RAS), to assess disorders of the lipid metabolism for diagnostic purposes. The essence of the method is to determine the level of unsaturation of serum or blood plasma lipids which depends on the total amount of double bonds (DB) in UFAs both in a free state and within lipid combination. This parameter is called the Double Bond Index (DBI). DBI is measured by a domestic device ADS-5M («Double bond analyzer») developed at FRCCP RAS. The control group consisted of 20 healthy men, comparable in age. Statistical analysis of the data was carried out using the STATISTICA 10.0 program.

**Results:** Patients were divided into 2 groups: patients with gout with normal blood pressure (group 1; n = 38) and with AH (group 2; n = 49). Patients from group 2 differed by a longer course of gout and had a higher level of uric acid in comparison with patients from group 1. The number of joints involved in the inflammatory process in patients from group 2 exceeded the number of those in patients from group 1. Patients from group 2 had more often attacks of gouty arthritis and the severity of pain during the last year compared with group 1. The normative value of the blood serum lipids DBI was determined for the control group of healthy people (260 $\pm$ 20 conventional units (c.u.)) by the ozonation method. A significant deviation of the DBI from the norm both increased and decreased is a sign of pathology. In all groups DBI is lower than the norm but to a different extent. DBI is slightly reduced relative to the norm (DB = 229 c.u.) in group 1 therefore lipid metabolism is impaired just slightly. DB = 167 c.u. in group 2 which indicates a significant disorder of lipid metabolism (p<0.05). Thus the ozonation method is informative and allows