Conclusion: Gout patients with/without two years adherence of urate-lowering agents does not have an impact on ESRD and all-cause mortality.

References: Nil

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THU0425

ULTRASOUND DETECTED URATE CRYSTALS DEPOSITIONS ARE ASSOCIATED WITH ELEVATED CALPROTECTIN AND CRP INDICATING SUBCLINICAL INFLAMMATION; BASELINE RESULTS FROM THE NOR-GOUT STUDY

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Background: Ultrasound detects depositions of monosodium urate (MSU) crystals in gout patients. The OMERACT ultrasound group has developed definitions for elementary lesions in gout including the double contour (DC) sign (depositions of crystals on the surface of cartilage) and tophus (larger hypo-echoic aggregation of crystals, usually well delineated). Calprotectin is a major granulocyte protein found to be sensitive to reflect the level of inflammation in several immunological diseases. There may be an association between low grade inflammation and co-morbidity (including cardio-vascular pathology) in gout patients.

Objectives: To explore whether the extent of depositions (e.g. DC and tophi) was associated with inflammation in gout patients.

Methods: The baseline data from NOR-GOUT, a prospective observational study of patients with crystal-proven gout with increased serum urate levels (>360 µmol/L), were presently used. All patients had an extensive ultrasound examination (GE E9 machine, grey scale 15MHz) to assess MSU depositions (DC and tophi) with bilateral assessment of radiocarpal joint, MCP 2, insertion of triceps and quadriceps, proximal and distal patellar and the Achilles tendon, cartilage of distal femur (maximal flexed knee), the talar cartilage of tibiotalar joint and MTP 1 joint. The degree of elementary lesions was semi-quantitatively scored 0-3 (0=none, 1=possible, 2=certain, 3=major depositions). Total sum scores of DC and tophi were calculated and the associations with calprotectin (plasma assessed by ELISA (Calpro), normal levels <910 µg/L) as well as C-reactive protein (CRP, assessed as a routine at our laboratory, normal levels <4mg/L) were explored. Correlations were performed by use of Spearman and differences between groups were investigated by Mann-Whitney tests.

Results: A total of 111 patients who had calprotectin assessed were included in the study (92% men, mean (SD) age 54.5 (14.5) years, disease duration 7.1 (6.6) years) when initiating MSU lowering treatment. The mean (SD) sum score DC and tophi was 9.1 (7.8), calprotectin 780 (500) µg/L, CRP 7 (15) mg/L, serum urate (SUA) 505 (87) µmol/L, creatinine 96 (18) µmol/L and eGFR 79 (20) ml/min/1.73m². Table 1 shows significant correlations between sum score DC/tophi and calprotectin, CRP, SUA, creatinine and eGFR. Increased calprotectin levels (≥910 µg/L) were found in 28% and increased CRP (≥ 4mg/L) in 39%. Patients with increased vs normal levels of calprotectin had significantly higher levels of DC/tophi depositions (mean (SD) 13.0 (10.4) vs 7.4 (5.8), p=0.01), and similar was found for CRP (11.4 (9.5) vs 7.6 (6.2), p=0.033) (illustrated in table 2).

Conclusion: In gout patients, higher load of MSU depositions was associated with increased inflammatory markers. This indicates that the amount of depositions is associated with higher inflammatory activity, which could have systemic implications.

	Sum score DC and tophi	Calprotectin	CRP	SUA	Creatinine
Calprotectin	0.31*				
CRP	0.29*	0.65**			
SUA	0.31**	0.22*	0.19		
Creatinine	0.34**	0.25*	0.15	0.36**	
eGFR	-0.38**	-0.27*	-0.21*	-0.18	-0.86**

*p<0.05, **p<0.001

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THU0426

CLINICAL CHARACTERISTIC OF INFECTIOUS ULCERATION OVER TOPHI

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Background: Infection in ulceration over tophi is the leading cause of sepsis in patients with gout, which is the main indication for surgery. Additionally,

patients with infection will significantly prolonged wound closure time compared with those without infection. Investigation of infection in ulceration over tophi will improve our understanding of this critical issue.

Objectives: To describe the microbiological profile in ulceration over tophi, antibiotic susceptibility patterns of causative agents, and to study the prediction of infection in ulceration over tophi among patients with gout.

Methods: Patients with ulceration over tophi were prospectively enrolled. The clinical characteristics were recorded and microbiological specimens were taken on admission. Specimens were cultured for aerobic and anaerobic bacteria, and antibiotic susceptibility testing was performed for the culture isolates. Patients were divided into 2 groups according to having infectious ulceration or not and the potential risk factors for infectious ulceration over tophi were examined using univariate and multivariate logistic regression analyses.

Results: A total of 82 patients were included for analysis. 46 pathogens were isolated from 39 (47.6%) patients, among which the top 3 were *Staphylococcus aureus* (43.5%), *Pseudomonas aeruginosa* (17.4%) and *Enterococcus faecalis* (13.0%). Overall, the Gram-positive bacilli were more sensitive to gentamicin (81.5%), amikacin (88.9%), trimethoprim/sulfamethoxazole (92.6%), nitrofurantoin (96.3%), linezolid (100.0%), teicoplanin (100.0%) and vancomycin (100.0%) whereas penicillin, oxacillin and ampicillin were 66.7% to 77.8% resistant. The Gram-negative bacilli were more sensitive to amikacin (84.2%), cefoperazone/sulbactam (84.2%) and meropenem (89.5%) whereas ampicillin, amoxicillin/clavulanate, cefotaxime, cefazolin, piperacillin, trimethoprim/sulfamethoxazole and tetracycline were 68.4% to 100% resistant. Patients with infection had a higher rate of smoking history and type 2 diabetes, with higher levels of erythrocyte sedimentation rate, C-reactive protein and leucocyte, and lower level of albumin. In stepwise logistic regression analysis, type 2 diabetes (adjusted OR 5.064; 95% CI = 1.430 to 17.928) and albumin level (adjusted OR 0.855; 95% CI = 0.782 to 0.935) were independent predictors of infection in ulceration over tophi.

Conclusion: Infection is common in ulceration over tophi. Different antibiotic susceptibility patterns were observed in Gram-positive bacilli and Gram-negative bacilli. Type 2 diabetes and low albumin level were associated with an increased risk of infection in ulceration over tophi. The data in this study will be beneficial for tailoring infection control measures in a way that improves outcomes of ulceration over tophi.

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Table 1. Bacteria isolated from initial ulceration specimens taken on the first admission.

Bacteria	Number* (n = 46)	Proportion (%)
Gram-positive bacilli	27	58.7
Staphylococcus aureus	20	43.5
Enterococcus faecalis	6	13.0
Streptococcus mutans	1	2.2
Gram-negative bacilli	19	41.3
Pseudomonas aeruginosa	8	17.4
Klebsiella pneumonia	4	8.7
Enterobacter cloacae	3	6.5
Escherichia coli	2	4.3
Acinetobacter baumannii	2	4.3

* Number of ulceration

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THU0427

SHOULD FEBUXOSTAT-RESISTANCE BE ADDED TO CRITERIA FOR REFRACTORY GOUT? A PRELIMINARY STUDY

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Background: Refractory gout manifests as recurrent flares, chronic arthritis and progressive tophaceous deposits. Febuxostat is a widely-used potent serum urate-lowering reagent, but some gout patients cannot achieve target serum uric acid (sUA) after they used this reagent.

Objectives: To determine whether febuxostat-resistance should be a criterion for refractory gout, characteristics of gout patients who were resistance to febuxostat or allopurinol were compared.

Methods: This study was performed from December 2015 to December 2019. Medical records of gout patients who met the 2015 gout classification criteria [1] and undertook febuxostat (febuxostat group) or allopurinol (allopurinol group) urate-lowering therapy (ULT) were assessed. Dose of ULT was adjusted till sUA was below 6mg/dL and 5mg/dL for patients with urate deposition. We screened gout patients who had contraindication or history of failure to normalize sUA for ≥ 3 months of treatment with the maximum medically appropriate febuxostat (febuxostat-resistance) or allopurinol (allopurinol-resistance) dose as defined by physicians. Furthermore, these screened patients met the traditional criteria of refractory gout except therapeutic reaction [2]. Demography and clinical characteristics were recorded. Features between febuxostat-resistance and allopurinol-resistance patients were compared.

Results: (1) Of 683 gout patients who were included, 516 and 167 of them used febuxostat or allopurinol. (2) Age (41.92±11.58 vs. 42.26±9.41 years), Male gender (97.50% vs. 97.01%), duration of gout (5.78±4.74 vs. 5.05±4.72 years) and sUA (6.30±2.50 vs. 6.67±2.14mg/dL) were similar between febuxostat group and allopurinol group (P>0.05). (3) Dose of febuxostat or allopurinol were 47.28mg/day and 178.24mg/day. (4) Sixteen patients were febuxostat-resistance, while 6 patients were allopurinol-resistance. Prevalence rates of treatment resistance were comparable between groups (3.10% vs. 3.59%, P>0.05). (5) Some parameters were different between resistance patients and non-resistance patients in both groups (Table 1, P<0.05). However, characteristics of febuxostat-resistance and allopurinol-resistance patients were similar (P>0.05).

Table 1 Characteristics of gout patients in febuxostat group and allopurinol group

Parameters	Febuxostat Group		Allopurinol Group	
	Non-resistance (n=500)	Resistance (n=16)	Non-resistance (n=161)	Resistance (n=6)
Age (year)	41.93±11.65	41.67±9.58	42.22±13.33	44.50±16.98
Male Gender (%)	97.40	100.00	96.89	100.00
BMI (kg/m ²)	25.44±3.46	26.22±3.47	25.86±3.97	25.60±6.42
Duration of gout (years)	5.75±4.76	7.00±3.97 [*]	4.96±4.73	7.75±2.62 [*]
Flares in previous 18 months (times)	1.31±0.44	3.67±0.70 [*]	1.13±0.24	3.25±0.50 [*]
Presence of Tophi (%)	23.80	100.00 [*]	14.90	100.00 [*]
Presence of Complication (%)	35.8	100.00 [*]	31.06	100.00 [*]
sUA (mg/dL)	6.21±2.47	9.13±1.24 [*]	6.42±2.32	10.15±3.55 [*]
SCr (μmol/L)	100.67±15.03	163.96±29.41 [*]	96.93±22.91	133.75±31.60 [*]
ESR (mm/L)	24.59±19.28	42.83±21.13 [*]	27.49±24.10	56.50±28.12 [*]
CRP (mg/L)	18.92±18.59	28.81±23.85 [*]	23.12±22.63	32.28±23.64 [*]

^{*}P<0.05 compared with non-resistance patients in the same group.
BMI body mass index, sUA serum uric acid, SCr serum creatinine, ESR erythrocyte sedimentation rate, CRP C-reactive protein

Conclusion: Febuxostat-resistance is a potential criterion for refractory gout, because febuxostat-resistance patients shares similar characteristics of patients with refractory gout.

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THU0429

THE ASSOCIATION OF SERUM VITAMIN A, VITAMIN E, AND FOLATE WITH HYPERURICEMIA: AN ANALYSIS OF POPULATION-BASED NATIONALLY REPRESENTATIVE DATA

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Background: Hyperuricemia is an important risk factor for gout as well as hypertension, type 2 diabetes and renal impairment. Although previous studies investigated the association of questionnaire-based micronutrient intake with serum uric acid levels, limited data on serum micronutrients levels in relation to the risk of hyperuricemia especially in Asian population.