Objectives: To determine whether gout patients have an impaired sense of smell.

Methods: This was a cross-sectional prospective study of gout patients seen in our rheumatology clinic. The first 30 clinic patients were recruited during the period 7/15/17-5/25/18. Each patient was administered the 40-item UPSIT. UPSIT scores were compared to age- and sex-matched controls from a normative database maintained at the University of Pennsylvania Smell and Taste Center using a paired t-test.

Results: Gout patients ranged in age from 31 - 86 years (mean: 59 years); 26 (87%) of patients were ≥ 40 years old and included 26 men and 4 women. The duration of gout ranged from 1- 43 years (mean: 9 years), with 19 having gout for >5 years. Visible tophi were observed in 6 patients (33%). C-reactive protein was within normal range except in one gout patient. Serum urate levels ranged from 5.1-12 mg/dL (mean: 6.29 mg/dL). Two patients were current smokers; both have microsomia. No patients had head trauma, chronic sinusitis, upper respiratory tract infections, alcoholism or neurological disorders.

The mean UPSIT scores of the two groups did not differ significantly [respective patient and control means (SDs) = 31.40 (5.79) and 31.80 (4.37); $t_{29} = -0.342$, $p = 0.74$].

Conclusion: This is the first study to quantitatively assess smell function in patients with gout. Despite being a systemic inflammatory disease, with multiple associated comorbidities, we did not find a statistically significant effect of gout on smell function using a well validated olfactory test.

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Disclosure of Interests: Naomi Schlesinger Grant/research support from: Pfizer, Consultant for: YesNovartis, Horizon Pharma, Proteo Thera, Selecta Biosciences, Olatec, IFM Therapeutics, Mallinckrodt Pharmaceuticals, Mohamed Elsaid: None declared, Vinod Rustgi Grant/research support from: Genfit, Consultant for: yes Allergan, Zydus, Abbvie

DOI: 10.1136/annrheumdis-2019-eular.667

AB0888 A SURVEY FOR DIAGNOSIS AND TREATMENT OF PATIENTS WITH GOUT IN KOREA

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Background: The prevalence and incidence of gout has risen over the past few decades and the socioeconomic costs of gout have been increasing accordingly, but it is unclear whether proper medical care is provided for patients with gout.

Objectives: This study aims to investigate the actual status and adequacy of diagnosis and management of gout patients.

Methods: The patients with gout who visited between November 2017 and February 2018 were consecutively enrolled. Data were collected using a pre-designed questionnaire and reviews of medical records. The collected data included diagnosis and management of gout before starting a steady treatment in our clinic, and disease status at first visit to our clinic.

Results: In total, 172 gout patients were enrolled. The average age of the patients was 55 (interquartile range (IQR): 45-66) years, and 94.2% were men. The average disease duration was 8 (IQR: 4-13) years. The average age of first gout symptoms was 45 (IQR: 36-53) years. The first symptom started in the feet for 93.4% of patients. The patients in which the first symptom region was around large joints were 35.1%, and 17.3% of patients developed first gout symptoms around multiple joints. Several patients (64%) visited the hospital directly after their first acute gout attack. The first physicians to examine gout patients were orthopedic surgeons (38.2%), emergency doctors (23.6%), and rheumatologist (16%). Upon initial medical examination, 67% of patients were clinically diagnosed or suspected with gout. Monosodium urate crystals in synovial fluid or tophi were confirmed in 10.5%. Furthermore, 31% of patients had a history of pharmacology urate lowering therapy (ULT) after acute gout attack, and 84.4% were indicated for pharmacologic ULT upon first visit to our clinic. Additionally, 47.6% of patients showed symptoms of chronic kidney disease, past urolithiasis, or tophi, and 52.4% suffered from ≥ 2

gout attacks/year. However, only 11.3% of patients were receiving continuous ULT before visiting our clinic.

Conclusion: Most patients were clinically diagnosed without appropriate tests for gout diagnosis, such as joint aspiration, and only a very small number of patients were receiving adequate pharmacologic ULT. The management of gout seems to be inadequate in many respects.

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Disclosure of Interests: Mi Ryoung Seo Grant/research support from: I received KRW 15 million (approximately 1,300 USD) in research funding for this study from CHODANG Pharm., Ji Na Yeo: None declared, Hee Jung Ryu: None declared, Hyo-Jin Choi: None declared, Han Joo Baek: None declared

DOI: 10.1136/annrheumdis-2019-eular.1553

AB0888 ULTRASOUND FEATURES IN GOUT: A COMPARATIVE ANALYSIS WITH MATCHED CONTROL

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Background: Gout is a frequent inflammatory disease characterized by deposition of monosodium urate crystals in joints and tissues in the presence of hyperuricemia (1). Ultrasound (US) is a simple imaging technique that has gained interest in the assessment of individuals with gout due to its ability to identify inflammation and joint damage, as well as crystal deposition. The most characteristic gout US findings are the presence of intra-articular aggregates and the double contour (DC) signal, included in the 2015 ACR/EULAR classification criteria.

Objectives: To identify potential differentiating US findings between individuals with gout and matched controls.

Methods: A cross-sectional study was conducted, including 57 gout adult patients and 32 adult individuals with a normal uricemia, matched by age and gender. Sociodemographic, clinical and analytical data were collected. Bilateral US grey scale evaluation of the 1st metatarsophalangeal joint (MTP1), 2nd metacarpophalangeal (MCP2) and knee was performed in all participants. The following findings were assessed: intra-articular effusion, synovial hypertrophy, bone erosion, DC signal and intra-articular deposits. None of the participants presented with clinical signs of arthritis at the time of the evaluation.

Results: The mean age of gout patients and healthy individuals was 63.3 $\pm$ 12.6 and 63.8 $\pm$ 10.5 years, respectively. The majority of the gout patients were male (87.7%), 77.2% had previous history of podagra and 26.3% had tophi. Mean disease duration was 4.3 years. Mean uricemia was 6.7 $\pm$ 2.0 mg/dl in gout patients and 4.9 $\pm$ 0.9 mg/dl in the control group. At the time of the study, 31 patients (54.4%) were treated with allopurinol, 9 (15.8%) with febuxostat, 1 (1.8%) with both allopurinol and febuxostat and 16 (28%) were not on urate lowering therapy.

Comparatively to the control group, in the MTP1, patients with gout presented more frequently with synovial hypertrophy (26 vs 0, $p < 0.001$), bone erosion (19 vs 0, $p < 0.001$), DC signal (7 vs 0, $p < 0.05$) and intra-articular aggregates (8 vs 0, $p < 0.05$). At the knee, patients showed more often effusion (19 vs 2, $p < 0.001$), synovial hypertrophy (26 vs 1, $p < 0.001$) and DC signal (8 vs 0, $p < 0.05$). At the MCP2, only the presence of erosion was significantly more common in the gout group (8 vs 0, $p < 0.05$). DC signal was found in 17 patients and in none of the healthy subjects ($p < 0.001$); this finding was more frequently observed at the knee. There was an association between previous gout crisis in the MTP1 and the presence of erosion in this joint ($p = 0.04$). An association was found between the presence of tophi and erosion ($p < 0.001$), DC signal ($p < 0.05$) and intra-articular aggregates ($p = 0.006$). There was no association between uricemia levels, disease duration and the different US findings.

Conclusion: In this study, the presence of synovial hypertrophy, erosions, DC signal and intra-articular deposits were the most frequent US findings in patients with gout. Moreover, these findings at the MTP1 joint allowed to distinguish between gout patients and matched control subjects. US seems to be useful to demonstrate evocative signs of crystal accumulation, inflammation or joint damage, even in the absence of overt arthritis.

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Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2019-eular.3367

AB0889 NEURAL NETWORKS IN PREDICTION OF KIDNEY DISEASE IN GOUT PATIENTS WITH OBESITY

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Background: Nowadays, in addition to correctly verified diagnosis and effective therapy of gouty nephropathy in obese patients, there is a problem to predict the development of kidney disease in this cohort of patients. Gouty nephropathy may have subclinical course for years, that's why, with what probability it can occur? To solve such kind of problem we used neural networks or "artificial intellect".

Objectives: To predict gouty nephropathy.

Methods: A one-center cohort prospective study was conducted that included 117 patients with gouty arthritis, who were on scheduled in-patient treatment at the Rheumatologic Department of Ternopil University Hospital during 2015-2018 years. All patients had no history of any kidney disease. Statistical analysis was performed with STATISTICA software.

Results: To create a neural network, as input information, it is necessary to select data that have the greatest correlation with gouty nephropathy. Significant correlations between gouty nephropathy and hyperuricemia ($r=0.85$), uricosuria ($r=-0.79$), hypercholesterolemia ($r=0.44$), hypertriglyceridemia ($r=0.84$), an increase of low density lipoproteins ($r=0.80$), concomitant arterial hypertension ($r=0.81$), diabetes mellitus ($r = 0.59$) were established. Age of the patients, the number of involved joints and the duration of the disease were also included.

Then the probability of development of gouty nephropathy can be calculated by the formula:

$$P(I) = \frac{1}{1 + e^{-5 D \cdot W}}$$

$P(I)$ – probability (III) of having gouty nephropathy in a patient. Accepts values from 0 to 1. 0 – absolutely (100%) healthy patient, 1 – absolutely (100%) ill patient;

W – weight, vector of weights of synaptic arches of artificial neuron;

D – patient's data scaled at intervals of 0 to 1, in such a way that the minimum possible value corresponds to 0, and to the maximum possible – 1;

e – Euler's number.

To facilitate mathematical calculations, a peculiar "calculator" for predicting kidney damage in obese gout patients has been developed. This formula was written in Microsoft Office Excel and automatically calculates the probability of development of gouty nephropathy in%. Approval of this method indicated that 15.6% of the patients without gouty nephropathy may have development of kidney disease in the range of 55.1 - 98.8%.

Conclusion: Consequently, having input data (levels of uric acid in the blood, uric acid in the urine, cholesterol, triglycerides, low density lipoproteins, the presence of concomitant hypertension, diabetes mellitus, the number of affected joints and the duration of the disease), it is easy to predict the probability of kidney disease in patients with gout and obesity using the proposed formula.

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Disclosure of Interests: Svitlana Smiyan Grant/research support from: Celltrion, Inc., Maksym Franchuk Grant/research support from: Celltrion, Inc.

DOI: 10.1136/annrheumdis-2019-eular.5585

AB0890 EFFECT OF DIFFERENT TYPES OF URIC ACID-LOWERING DRUGS ON GOUT ATTACK

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Background: Gout is an inflammatory arthritis associated with hyperuricemia which is caused by purine metabolism disorders. General uric acid lowering treatment sometimes causes the onset of gout, but the specific cause is not clear. Our group has found that adenine nucleoside triphosphate (ATP) plays an important role in the pathogenesis of gout. It synergizes with MSU to stimulate the secretion of IL-1 β , leading to the onset of gout.^{1,2} The xanthine oxidase inhibitors promote the production of ATP, while the drugs that promotes the excretion of uric acid does not affect ATP production. Therefore, we speculate that gout attacks induced by allopurinol and febuxostat are related to the role that ATP plays in the pathogenesis of gout.

Objectives: To compare the effects of drugs that inhibit uric acid production and promote uric acid excretion on gout.

Methods: A case-control study was used to compare the changes in serum uric acid concentration and observe whether the patients would suffer gouty arthritis within one month. The gout patients complied with the standard that the number of gout attacks did not exceed three times, as well as more than one time within the past six months, were selected. And patients with other chronic inflammatory and infectious diseases were excluded.

Results: A total of 148 patients with gout in the Department of Rheumatology and Immunology of Anhui Provincial Hospital were collected, all of whom were male. According to the patients taking uric acid-lowering drugs, they were divided into four groups: group A: control group (no uric acid-lowering treatment, n=35); group B: febuxostat group (40 mg Qd, n=66); group C: allopurinol group (0.1 g Bid, n=11); group D: benz-bromarone group (50mg Qd, n=36). The statistical results are as follows: (1) The levels of serum uric acid in group B, C and D were significantly decreased after uric acid-lowering treatment compared with those before treatment (B: 389.6 $\pm$ 88.9 vs 547.5 $\pm$ 93.0, C:363.3 $\pm$ 28.6 vs 504.0 $\pm$ 38.3, D: 376.2 $\pm$ 108.5 vs 557.3 $\pm$ 101.8) within one month, and there was no significant difference in the level of uric acid before uric acid-lowering treatment among the three groups. (2) Comparison of gouty arthritis recurrence rates: The recurrence rate of gout patients in group B was 33.3%, and was 18.2% in group C, which was significantly higher than that in group D (11.1%), the difference was statistically significant ($P<0.05$); the recurrence rate of gout patients in group A was 14.3%, and there was no significant difference compared with group D ($P>0.05$); the recurrence rate of gout patients treated by drugs that inhibited uric acid production (B+C group) was 31.2%, which was significantly higher than patients treated by drugs that promoted uric acid excretion (D group) 11.1%, the difference was statistically significant ($P<0.05$).

Conclusion: Under the same uric acid-lowering intensity, the drugs that inhibit uric acid production can induce gout attacks during the process of uric acid lowering, while the drugs that promote uric acid excretion has less effect on the recurrence of gouty arthritis.

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Acknowledgement: This work was supported by grants from the National Natural Science Foundation of China (81771774) and the Anhui Provincial Natural Science Foundation (1708085MH191)

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2019-eular.7707