THU0447 CO-MORBID GOUT IS ASSOCIATED WITH INCREASED CARDIOVASCULAR RISK FACTORS IN PATIENTS WITH TYPE 2 DIABETES, BUT NOT CARDIOVASCULAR EVENTS OR MORTALITY

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Background: Gout is an inflammatory arthropathy characterised by elevated serum uric acid levels. In Australia, gout has a prevalence of 1.7 - 4%.[1] This increased to ~10% in community based Australian patients with type 2 diabetes, although elevated serum uric acid did not predict cardiovascular (CV) or all-cause mortality.[2] To date, the long-term outcomes of patients with diabetes and comorbid gout being followed up in the hospital out-patient setting have not been studied.
Objectives: To compare cardiovascular risk factors and long-term outcomes and mortality in patients with type 2 diabetes according to the presence or absence of gout.
Methods: 1,405 patients with type 2 diabetes were prospectively recruited from the outpatient setting at Austin Hospital. Baseline cardiovascular risk factors and comorbidities were identified. Patients were classified as having gout if they gave a history of gout or were taking medication for the treatment of gout. For statistical analysis, patients with diabetes (Group 1) were compared to those with diabetes and gout (Group 2). Cardiovascular events and long-term CV mortality were assessed over a 10 year period.
Results: There were 1,329 patients with diabetes (Group 1; 95%) and 76 with diabetes and gout (Group 2; 5%). Patients with gout were older (68±11 vs. 64±12y, p=0.004), more likely to be male (80% vs. 59%, p<0.0001), with higher triglyceride levels (2.6 vs 1.9 mmol/L, p=0.002), lower HDL (1.05 vs. 1.24 mmol/L, p<0.0001), higher BMI (33 vs. 31, p=0.026), and were more likely to have nephropathy (55% (n=35) vs. 26% (n=311), p<0.0001) with increased albumin creatinine ratio (3.4 vs 1.8 g/mmol, p=0.002). Despite the worse cardiovascular risk profile in those with gout and diabetes, cardiovascular events and all-cause mortality were not significantly different between the groups (Group 1, 27% (n=333) vs. 35% (n=23) in Group 2, p=0.201).
Conclusions: Although patients with comorbid gout and type 2 diabetes have a worse cardiovascular risk factor profile compared to those with diabetes alone, this was not associated with increased cardiovascular morbidity or all-cause mortality. These results suggest that elevated uric acid and gout are markers rather than determinants of CV mortality.
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THU0448 CHARACTERIZATION OF PATIENTS WITH CHRONIC REFRACTORY GOUT WHO DO AND DO NOT HAVE CLINICALLY APPARENT TOPHI: RESPONSE TO PEGLOTICASE

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Background: The term "chronic refractory gout" defines a subset of chronic gout patients who are either intolerant of or unresponsive to standard uric acid (UA) lowering therapy (ULT). Subjects (N=85) meeting this definition were enrolled in a study of pegloticase (8 mg every 2 weeks [q2w], the approved dose), a mammalian recombinant uricase conjugated to polyethylene glycol that is approved for the treatment of gout refractory to conventional oral ULT. Of this group of subjects, 73% had clinically apparent tophi, whereas 27% did not.
Objectives: To determine the clinical characteristics and response to pegloticase therapy in patients with chronic refractory gout with and without clinically apparent tophi.
Methods: This analysis used results from two pivotal randomized controlled trials[1] to assess the clinical characteristics and the efficacy of pegloticase (8 mg q2w) in patients with chronic refractory gout with or without tophi at baseline. The results for serum urate (UA), flares, Patient Global Assessment (PGA), tender and swollen joints (TJC and SJC), bodily pain, Health Assessment Questionnaire-Disability Index (HAQ-DI), and the Arthritis-Specific Health Index (ASHI) and Bodily Pain from the Medical Outcomes Study Short Form 36 item (SF-36) were determined for each group.
Results: The analysis included patients with chronic refractory gout, 62 with tophi at baseline and 23 without tophi. Chronic refractory gout patients in the two groups were similar at baseline, with the only significant differences in mean values between tophaceous and nontophaceous gout groups as follows: TJC, 14.2 vs 5.00 (P=0.01); SJC, 10.9 vs 3.4 (P=0.003); ASHI, 50.4 vs 64.7 (P=0.03); and HAQ-DI, 1.3 vs 0.6, respectively (P=0.001). Other measures of disease impact and comorbidities were not significantly different between groups. Treatment with pegloticase 8 mg q2w resulted in significant and comparable reductions in serum UA in both groups. Comparison of results from baseline and after 6 months of treatment for patients with tophi at baseline indicated significant reductions in serum UA (P<0.0001), flares (P<0.0001), PGA (P<0.0001), TJC and SJC (both P<0.0001), HAQ-DI (P=0.02), and SF-36 Bodily Pain (P<0.0001). Results for patients without clinically apparent tophi at baseline indicated significant improvements in serum UA (P<0.0001), flares (P=0.004), PGA (P=0.009), TJC (P=0.01), SJC (P=0.003), SF-36 Bodily Pain (P=0.03), and ASHI (P=0.0001).
Conclusions: These results indicate that chronic refractory gout patients may present with or without clinically apparent tophi. Tophaceous patients are distinguished by more tender and swollen joints, greater disability, and greater arthritis severity, but otherwise are similar to nontophaceous patients. Both groups had significant clinical benefit over 6 months of treatment with pegloticase.
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THU0449 EVIDENCE BASED DEVELOPMENT OF CRITERIA FOR COMPLETE RESPONSE IN PATIENTS WITH CHRONIC REFRACTORY GOUT

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Background: Preliminary criteria for remission in gout patients have recently been proposed. These include serum urate, acute flares, tophus, pain and patient global assessment.[1] These preliminary criteria were based on consensus exercises and have not yet been tested in a large clinical trial database of chronic gout patients. Because of the availability of clinical results from subjects with chronic refractory gout treated with pegloticase (8 mg every 2 weeks), a mammalian recombinant uricase conjugated to polyethylene glycol that is approved in the US for treatment of adult patients with chronic gout refractory to oral urate lowering therapy[2], the utility of these proposed criteria could be assessed.
Objectives: To test the utility of the preliminary criteria to discern a complete response (CR) in subjects with chronic refractory gout treated with pegloticase (8 mg every 2 weeks).
Methods: Data from two randomized clinical trials (RCT) evaluating the impact of pegloticase therapy in subjects with chronic refractory gout were examined.[2] Of this group of subjects, 42% had persistently lowered serum urate and 58% did not meet the urate-lowering endpoint of this RCT. Initially, individual patient data was reviewed to establish the frequency with which subjects, who were responders to pegloticase, met the proposed remission criteria. Mixed modeling was then employed on data from these subjects to determine the components of the model that best correlated with time of maximum benefit.
Results: Of 34 pegloticase responders, 25 (73.5%) met the published criteria[1] of remission. However, pain assessment was often an outlier; data obtained by visual analogue scale and Medical Outcomes Study Short Form-36 questionnaire often differed. Mixed modeling was, therefore, carried out using the data obtained from the subjects meeting criteria for remission to determine the components that best correlated with time to maximum benefit. Other clinical outcome measures assessed in the clinical trial were also analyzed. Besides serum urate levels in the mixed modeling analysis, the components of response that best correlated with time of maximum benefit included assessment of tophi (analyzed photographically), number of swollen joints, number of tender joints and patient global assessment. Using these criteria, 25 of the responders (73.5%) and 29.4% of the entire pegloticase-treated population met criteria for a CR. The median time to reach a CR was 252 days (range: 126–966 days). Of interest, when a decrease in serum urate was omitted, 6 (12.2%) of the pegloticase nonresponders also met criteria for a CR. Patients receiving placebo did not achieve the composite outcome measure considered as CR.
Conclusions: These results have defined criteria for achieving CR in individuals with chronic refractory gout treated with pegloticase and suggest that most individuals who persistently lowered their serum urate levels while on pegloticase reached criteria for CR in a median of 8.4 months. This composite CR definition can serve as an evidence-based target aiding the design and endpoints of future clinical trials.
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THU0450 HOSPITAL READMISSIONS FOR GOUT IN THE UNITED STATES: A NATIONAL DATABASE STUDY

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Background: Gout is associated with significant burden and risk of readmission. Little is known about readmissions among Gout patients on a national level in the United States.
Objectives: The aim of this study was to describe unplanned hospital readmission rates among adult gout patients and assess predictors of readmission.
Methods: We analyzed the 2013 National Readmission Database (NRD) to quantify readmission rates among Gout patients. The NRD includes weighted discharge data from 21 geographically diverse states accounting for 49.3% of the U.S. population. It includes approximately 14 million un-weighted discharges (49.1% of all U.S. discharges) corresponding to 36 million annual discharges nationwide. NRD data is from patients with non-Medicare payers (Medicaid, private, self-pay, or other). Gout hospitalizations were identified using the International Classification of Diseases, ninth Revisions, Clinical Modification (ICD-9-CM) diagnosis code 274.0x. All hospitalizations for patients age $\geq$18 were included. In efforts to exclude routine readmissions, we excluded those admissions related to pregnancy, those for chemotherapy, admissions where the patient was readmitted the same day as they were discharged, who had deaths during the same index hospitalizations, hospitalizations for less than 24 hours, and those with missing discharge. We utilized Chi-square tests, t tests and Wilcoxon rank-sum tests as appropriate. Survey logistic regression was used to assess the relationship between potential predictors for readmissions and the odds of at least one 30-day unplanned readmission. This analysis was chosen given the NRD data, which involves nested, weighted observations that are inherently stratified in clusters to produce national estimates.
Results: A total of 10708 index hospitalizations which had Gout as the primary diagnosis were included in the analysis. Among those with a primary Gout diagnosis, there were 1212 30-days readmissions (11.3%). 14.3% percent of patients with Gout as the primary diagnosis on index hospitalization were readmitted with the same diagnosis. The next most common readmission diagnoses were congestive heart failure (CHF), septicemia, and acute and unspecified renal failure (Figure 1A). In multivariable analysis of index hospitalizations with Gout as the primary diagnosis, CHF (OR 1.25, 95% CI, 1.05–166), chronic kidney disease (CKD) (OR 1.54, 95% CI, 1.23–1.92), atrial fibrillation (AF) (OR 1.33, 95% CI, 1.10–1.78), deep venous thrombosis (DVT) (OR 1.29, 95% CI, 1.03–1.88), APR-DRG severity level 3 and 4 (OR 1.51, 95% CI, 1.01–2.38 and OR 2.10, 95% CI, 1.06–4.58), discharge to specialized care (OR 1.47, 95% CI, 1.07–2.02), discharge to home health care (OR 1.35, 95% CI, 1.03–1.77), and discharge against medical advice (OR 3.85, 95% CI, 1.50–9.91), were significantly associated with 30-days readmission after adjusting for demographics, comorbidities, hospital characteristics, payer type, and the APR-DRG severity scale (Figure 1B).
Conclusions: In a national readmissions database, 11.3% of patients admitted with a primary diagnosis of Gout were readmitted within 30 days. Significant predictors of readmission included CHF, CKD, AF, APR-DRG severity level 3 or 4 and any discharge other than routine.
Disclosure of Interest: None declared
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Figure 1A: Primary causes of Readmission

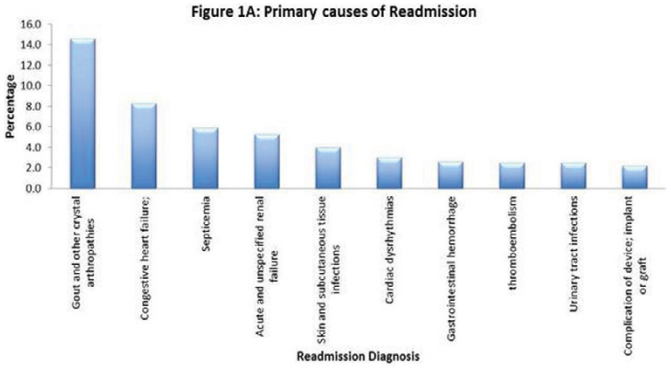
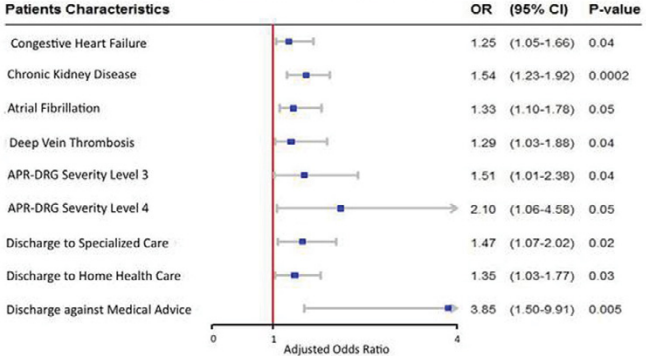


Figure 1B: Predictors for Primary Gout Readmissions



THU0451 A METHOD FOR COUNTING CALCIUM PYROPHOSPHATE CRYSTALS IN THE SYNOVIAL FLUID

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Background: Identification of calcium pyrophosphate dihydrate (CPP) crystals in the synovial fluid (SF) from inflamed joints provides a definitive diagnosis of CPP deposition disease (CPPD) (1). CPP crystals may also be found in non-inflamed joints, allowing diagnosis also during asymptomatic periods (2). SF analysis and CPP crystals count could be used to evaluate disease activity during follow-up. It is more difficult than the count of monosodium urate (MSU) crystals, already tested in a previous work (3), for CPP crystals show different shapes, are often very minute and non-birefringent.
Objectives: To study an objective method for counting CPP crystals in the SF.
Methods: The SFs aspirated from the knees of 15 consecutive patients (8 men) affected by CPPD diagnosed according to the EULAR definition were analysed. Cytological evaluation included SF leukocyte and differential count. For crystal detection, a small drop of fresh SF was placed on a glass slide and examined by compensated polarized microscopy (400x). To facilitate crystal count, the slide was divided into 4 equal parts drawing a cross with a pencil. The count was performed by continuous viewing and for each field both the number of birefringent and non-birefringent crystals was noted. Two observers evaluated separately 6 SFs and repeated the count after 24 hours. SFs were divided into 4 groups: SFs with $<$50, from 50 to 400, from 401 to 1200, and $>$1200 crystals.
Results: Mean time needed for the count was 60 minutes. Inter-reader agreement was 0.68 (0.47–0.88) for CPP crystals, 0.68 (0.50–0.85) for the birefringent ones and 0.60 (0.38–0.81) for the non-birefringent. Intra-reader agreement was 0.48 (0.17–0.78) for the first examiner and 0.30 (0.14–0.74) for the second. In 7 patient the SF was aspirated from an inflamed knee. Crystal number did not correlate with the presence of knee inflammation (r=0.41; p=0.19), the SF volume (r=0.14; p=0.61), the number of leukocytes (r=0.36; p=0.19), the % of PMN (r=0.25; p=0.37), and the presence of intracellular crystals (r=0.31, p=0.27). Actively inflamed joints had a higher SF volume [11 ml (10–20 ml) vs. 2 ml (1–10 ml), p=0.03] and a higher percentage of PMN [72% (0–94%) vs. 12% (0–68%), p=0.028]. SF with intracellular crystals showed also a higher percentage of PMN (57.1%±34.3% vs. 3%±6% p=0.006).
Conclusions: Our preliminary results indicate that CPP crystal count is less reliable and more time-consuming that that of MSU crystals. Non-birefringent crystals show lower inter-reader agreement than birefringent ones.
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THU0452 IMMEDIATE AND LONG TERM EFFICACY OF ANAKINRA IN ACUTE FLARES DUE TO HYDROXYAPATITE CALCIFICATIONS: A REAL-LIFE EXPERIENCE OF 13 CASES

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Background: Calcifications composed of hydroxyapatite (HA) crystals can induce acute and severe pain accompanied by signs of acute inflammation. In a previous pilot study, we have shown that anakinra was effective in acute flare of calcific periarthritis of the shoulder in the short term
Objectives: The goal of this retrospective observational study was to confirm these results in a larger set of patients, extending the observation to other localizations and to report on the long-term follow-up.
Methods: All consecutive patients with an acute flare due to HA deposition and treated with anakinra between March 2011 and November 2016 were included. Flare was defined as symptoms of acute pain at rest present for $<$10 days. None of the patients had corticosteroid therapy in the last 2 weeks, none had responded to at least 48 hours of high doses of NSAIDs or other rheumatologic diseases explaining the symptoms. Clinical evaluation consisted of patient assessment of pain by VAS (10mm scale) at days 0, 1, 3, 21 and joint mobility. CRP and ESR measurements, ultrasound and x-ray examinations were performed before the