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SAT0427 RISK OF MALIGNANCIES IN PATIENTS WITH GOUT: A POPULATION-BASED COHORT STUDY

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Background: Gout is a chronic disease characterized by deposition of monosodium urate crystals. Comorbidities including hypertension, chronic kidney disease, obesity, diabetes and cardiovascular diseases are common in patients with gout. In contrast to these well-known comorbidities, little is known about the risk of malignancies in patients with gout.

Objectives: To investigate the risk of malignancies in patients with gout, compared with general population.

Methods: We conducted a retrospective cohort study using Korean National Health Insurance Service-Medical check-up Cohort Database, which composed of qualified individuals as of 2002 in the age of 40-79 in 2002-2003 who received general medical check-up (Approximately 510,000). We enrolled patients newly diagnosed with gout, based on the diagnostic code and relevant medication history, who were between 40 and 65 years of age at the time of diagnosis between 2003 and 2007 (we washed out first year for newly detected cases). The gout patients (case group) were matched by 1:2 propensity score matching using confounding variables (age, sex, income group, region of residence, smoking status, alcohol intake, exercise habit, comorbidities including diabetes mellitus, hypertension and dyslipidemia, body mass index, blood pressure, serum glucose level, total cholesterol, and hemoglobin) and survival analysis was performed to estimate the risk of malignancy.

Results: A total of 4991 cases and 419992 controls were identified. The prevalence of Gout was 4991 (1.17%, male 4093 (82.01%); female 898 (17.99%)). During a mean follow-up of 12 years, malignancy was newly diagnosed in 30262 patients (7.12% of the total cohort). Gout was associated with increased risk of malignancy in the multivariable Cox proportional hazard regression analysis before propensity score matching (hazard ratio (HR) 1.248, 95% confidence interval (CI) 1.130-1.379, $p < 0.001$), as well as after matching (HR 1.369, 95% CI 1.209-1.549, $p < 0.001$).

Conclusion: A total of 4991 cases and 419992 controls were identified. The prevalence of Gout was 4991 (1.17%, male 4093 (82.01%); female 898 (17.99%)). During a mean follow-up of 12 years, malignancy was newly diagnosed in 30262 patients (7.12% of the total cohort). Gout was associated with increased risk of malignancy in the multivariable Cox proportional hazard regression analysis before propensity score matching (hazard ratio (HR) 1.248, 95% confidence interval (CI) 1.130-1.379, $p < 0.001$), as well as after matching (HR 1.369, 95% CI 1.209-1.549, $p < 0.001$).

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Not applicable

Table. Estimation of risk of malignancy using Cox proportional hazard regression analysis

	Before propensity score matching Cox			After propensity score matching Cox		
	HR	95% CI	P	HR	95% CI	P
Gout	1.248	1.130-1.379	<0.001	1.369	1.209-1.549	<0.001

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SAT0428 ANALYSIS OF THE PREVALENCE AND TIMING OF GOUT CO-MORBIDITY IN PATIENTS UNDERGOING KIDNEY TRANSPLANT

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Background: Patients receiving kidney transplants are at increased risk for the development of hyperuricemia and gout compared to the general population, which is generally attributed to the frequent use of calcineurin inhibitors (cyclosporine and tacrolimus). However, the precise proportion of renal transplant patients that develop gout and the time period post-transplant in which this occurs is less established.

Objectives: To analyze a large, mixed-insurance, US population database to determine gout prevalence in the renal transplant population.

Methods: A retrospective review of Humana Healthcare claims data (private and Medicare) from 2007 to 2017 was undertaken to identify kidney transplant patients with at least 6 months in plan prior to transplant and at least 6 months in plan post-transplant. Diagnosis of gout (≥ 1 gout ICD 10/ICD 9 code) was evaluated in relationship to the time of kidney transplant.

Results: The database contained 6,082 patients with a kidney transplant and at least 6 months in plan both pre and post-transplant. Of the 6,082 kidney transplant patients, 1,505 (25%) had a gout diagnosis: 908 (15% of transplant patients) with gout before and after transplant and 597 (10% of transplant patients) with a gout code only after transplant. In patients developing gout post-transplant, the mean time between transplant and gout diagnosis was 1.79 ± 1.85 years.

Conclusion: As expected, gout was a common comorbidity in renal transplant patients. 15% of the patients receiving renal transplants had gout prior to the transplant, and another 10% developed new-onset gout a mean of 1.79 years after receiving a renal transplant. This retrospective analysis demonstrates that kidney transplant patients commonly suffer from gout both before and after their transplant. In addition to more research on this topic, an increased focus on screening and treatment of gout in the renal transplant population may be warranted.

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SAT0429 COMORBIDITIES IN AN EARLY DIAGNOSED COHORT OF UNCONTROLLED VERSUS CONTROLLED GOUT: ANALYSIS OF A LARGE US PAYER DATABASE

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Background: Gout is a widely prevalent progressive systemic inflammatory arthritis. The pathogenic cause of gout is elevated serum uric acid or hyperuricemia, and appropriate treatment of gout involves reduction of uric acid levels to a minimum goal of less than 6 mg/dL. Patients who do not achieve uric acid goals are generally described as uncontrolled gout patients and tend to do worse in terms of clinical outcomes such as occurrence of flares and persistence/worsening of tophi. Gout patients often suffer from specific comorbidities, though whether uncontrolled gout patients have a different comorbidity profile is unclear.

Objectives: The objectives of this evaluation were to compare the comorbidities and hospitalizations in uncontrolled versus controlled gout patients from a large de-identified US payer database.

Methods: A retrospective review of Humana Healthcare data from 2007 to 2016 in private pay and Medicare patients was performed to identify

patients with at least 1 gout ICD 10/ICD 9 diagnosis code (N=539,802) and 90 days of continuous urate-lowering therapy within 1 year of diagnosis. Two cohorts of patients were categorized according to their sUA levels (≥ 1 test) after at least 90 days of gout therapy: sUA<6.0 mg/dL (controlled) and sUA ≥ 8 mg/dL (uncontrolled).

Results: The controlled gout group (sUA<6 mg/dL) included 5,473 patients and the uncontrolled gout group (sUA ≥ 8 mg/dL) had 1,358 patients. The two groups were comparable in terms of demographic features. Chronic kidney disease (CKD) was a common comorbidity overall in this gout population with higher prevalence in the uncontrolled gout cohort (49.4% of uncontrolled vs. 32.4% of controlled population; OR 2.04; 95% CI of 1.808 to 2.301, $p<0.001$). The most frequent hospitalization codes were similar between the uncontrolled and controlled patients with the exception of congestive heart and acute kidney failure. 20% of uncontrolled patients were hospitalized for congestive heart failure vs. 7% in controlled (OR 3.16, 95% CI: 2.674 to 3.739, $p<0.001$), and 20% of uncontrolled patients were hospitalized for acute kidney failure vs. 8% in controlled (OR 2.95, 95% CI: 2.497 to 3.480, $p<0.001$).

Conclusion: Gout patients frequently suffer from cardiovascular and renal diseases. This large retrospective analysis suggests that when divided based on uric acid levels attained, uncontrolled gout patients are more likely to suffer from CKD and also more likely to be hospitalized for acute renal failure than controlled gout patients. Whether hyperuricemia in uncontrolled gout causes the development of specific cardiovascular and renal comorbidities, or if specific cardiovascular and renal diseases lead to hyperuricemia and uncontrolled gout is not fully established.

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SAT0430 IMPACT OF GOUT ON ALL-CAUSE MORTALITY AMONG MEDICARE BENEFICIARIES WITH A HISTORY OF KIDNEY TRANSPLANTATION: A RETROSPECTIVE COHORT STUDY

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Background: Gout is a frequent comorbidity among kidney transplant recipients. A recent analysis estimated that 13% of kidney transplant recipients had an active diagnosis of gout. The clinical impact of comorbid gout in this population is not well understood, including if gout as a co-morbidity associates with higher mortality rates among kidney transplant recipients.

Objectives: This retrospective patient claims analysis was performed to determine whether an association between gout and mortality exists in the prevalent kidney transplant population.

Methods: A retrospective study using administrative claims from the Medicare fee-for-service (FFS) Limited Data Set (LDS) was conducted. Multivariable Cox proportional hazards regression assessed the relationship between gout and all-cause mortality. Given the ambiguity of the causal relationship between gout and comorbidities that make up the Charlson

Comorbidity Index (CCI), three analyses were conducted assuming: 1) gout and certain comorbid conditions are associated by way of a common pathogenetic root, 2) gout is a precursor for developing these comorbid conditions, and 3) these conditions modify the effect of gout on mortality.

Results: Gout was associated with higher unadjusted risk of all-cause mortality (hazard ratio, HR: 1.44, 95% CI: 1.27-1.63). After adjusting for baseline demographics and time from transplantation, the HR risk with gout was attenuated but still statistically significant (HR: 1.16, 95% CI: 1.02-1.32). Further adjustment for baseline CCI found gout was not a significant risk factor (HR: 1.03, 95% CI: 0.90-1.17). Stratified models show gout among baseline CCI=0 score was associated with a 3.5-fold increased risk of all-cause mortality (HR: 3.48, 95% CI: 1.27-9.57).

Conclusion: The presence of gout was not an independent predictor of all-cause mortality among Medicare beneficiaries with a history of kidney transplantation. That gout in a subset of beneficiaries without baseline comorbidities was a predictor may suggest that gout serves as an early indicator of declining health in the larger prevalent kidney transplant population. Further research is needed to understand the relationship of gout and mortality in the kidney transplant population.

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SAT0431 RED GINSENG EXTRACTS SUPPRESS MONOSODIUM URATE CRYSTAL INDUCED NLRP3 ACTIVATION

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Background: It is well known that red ginseng extracts (RGE) has anti-inflammatory properties.

Objectives: We aimed to investigate if RGE could suppress monosodium urate crystal (MSU) - induced NLRP3 activation and thus could be a potential therapeutic for gout.

Methods: Acute air-pouch model was used to investigate *in vivo* effect on acute gouty inflammation of RGE in mice. Human monocyte cell line -THP-1- was stimulated with MSU in the presence of RGE and expression of NLRP3, ASC, caspase-1, IL-1 β was measured by PCR, immunoblotting and ELISA. Twenty four gout patients in intercritical period were randomized either to red ginseng tablet or placebo receiving group in a double-blind manner. After 3months of taking red ginseng tablets (RGT)/placebo, expression of NLRP3 and inflammatory cytokines of peripheral blood mononuclear cell was addressed by PCR.

Results: RGE sufficiently inhibited acute gouty inflammation in air-pouch mouse model, represented by reduced number of white blood cells in air pouch lavage fluid. *In vitro*, RGE dose-dependently suppressed MSU-induced IL-1 β production of THP-1 cells. RGE did not affect NLRP3 or pro IL-1 β expression. However, ASC oligomerization was inhibited and suppressed NLRP3 inflammasome assembly. Patients taking RGT for 3 months showed significantly reduced NLRP3 expression compared to baseline, which was not observed in the control group.