

Bone health in patients with gout using real-world U.S. data

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BACKGROUND

- Patients with gout may be at high risk for developing osteoporosis and fractures due to aspects of the disease itself (e.g., urate crystal deposition, bone erosions, impaired mobility which may predispose to falls) or treatment (e.g., glucocorticoids).
- Osteoporosis and related risk factors may be under-recognized and inadequately managed for gout patients.
- We utilized EHR data from the American College of Rheumatology's (ACR) Rheumatology Informatics System for Effectiveness (RISE) registry linked to Medicare to explore bone health in gout patients.

METHODS

- **Retrospective analysis of ACR RISE electronic health record (EHR) registry (2015-2021) linked to Medicare claims data (2016-2021)**
- **Index date defined as the date these criteria met:**
 - Patient had ≥1-year of continuous Medicare coverage
 - Age ≥18 with gout diagnosis (ICD9/10) and ULT or colchicine use
- No prior immunomodulatory drug, cancer, or other rheumatic disease in the 1 year prior to index (baseline)
- Patients with osteoarthritis (OA) and soft tissue rheumatism (STR) used as a comparator cohorts with the same inclusion/exclusion criteria; Matched 1:1 on age (± 2 years), sex, race, and calendar quarter
- **Examined**
 - We examined medications, comorbidities, demographics, and bone protective therapy use and computed crude and adjusted incidence rates (IRs) and incidence rate ratios (IRRs) for fracture (allowing for multiple events) in the gout vs. comparator cohorts.

RESULTS

Gout vs. OA	Gout vs. Soft Tissue Rheumatism (STR)
Baseline Comorbidities and Medication <ul style="list-style-type: none">• N=3350 pts in each cohort; gout pts with lower baseline fracture, OP dx, OP medication use, as follows:<ul style="list-style-type: none">• Fracture: 1.4% vs. 2.6%• Osteoporosis: 7.1% vs. 15.4%• OP Medication: 4.9% vs. 11.8% (Table 1)Follow-Up Fractures and OP Medication• Higher fracture rates in gout patients (IR: 1.4 (95% CI: 1.1 - 1.8) vs. IR: 1.0 (95% CI: 0.8 - 1.4) in OA)• (IRR: 1.4, 95% CI: 1.0, 2.0) (Figure 1)• Models adjusted for BMI, NSAID, diabetes, and RxRISK did not impact aIRR.	Baseline Comorbidities and Medication <ul style="list-style-type: none">• N=772 pts in each cohort; gout pts with lower baseline fracture, OP dx, and OP medication use, as follows:<ul style="list-style-type: none">• Fracture: 1.9% vs. 3.4%• Osteoporosis: 10.9% vs. 30.7%• OP Medication: 8.5% vs. 23.2% (Table 1)Follow-Up Fractures and OP Medication• Higher fracture rates in gout patients (IR: 2.0 (95% CI: 1.3 - 3.1) vs. IR: 0.8 (95% CI: 0.4 - 1.7) in STR)• (IRR: 2.4, 95% CI: 1.0, 5.5) (Figure 2)• Controlling for BMI, diabetes, RxRISK, ADI, smoking, and CPD further increased fracture rates in gout patients (aIRR: 4.2, 95% CI: 1.4, 12.5)• Any new OP medication: 2.2% in gout vs. 5.3% in OA

CONCLUSIONS

- Patients with gout experience greater rates of fracture and more commonly have fracture risk factors (e.g., chronic kidney disease, greater glucocorticoid use) compared to OA and soft tissue rheumatism patients.
- Despite these concerning findings, patients with gout are less likely to receive bone protective therapies.
- Improved awareness of the risk of fracture and osteoporosis in gout appears warranted, as are strategies to protect bone health in gout patients.

Table 1: Baseline Demographics of Patients with Gout vs. Osteoarthritis (N=6,700) And Gout vs. Soft Tissue Rheumatism (N=1,544)

Characteristic	Total N	Gout 3,350	OA 3,350	SMD	Total N	Gout 772	STR 772	SMD
Age, Median (IQR), years	6,700	72.0 (68.0, 77.0)	72.0 (68.0, 77.0)	0.00	1,544	71.0 (67.0, 76.0)	71.5 (67.0, 76.0)	0.00
Male	6,700	2,151 (64.2%)	2,151 (64.2%)	0.00	1,544	206 (26.7%)	206 (26.7%)	0.00
Race, White	5,894	2,520 (85.5%)	2,520 (85.5%)	0.00	1,372	642 (93.6%)	642 (93.6%)	0.00
Ethnicity, Non-Hispanic	5,056	2,520 (96.4%)	2,317 (94.9%)	0.07	1,074	540 (97.5%)	505 (97.1%)	0.02
BMI kg/m ² , Median (IQR)	5,596	31.0 (28.0, 36.0)	28.0 (25.0, 32.0)	0.47	1,304	33.0 (28.0, 38.0)	26.0 (23.0, 30.0)	1.0
N		2,827	2,769			644	660	
Baseline RXRISK**	6,700	1.0 (0.0, 6.0)	0.0 (0.0, 3.0)	0.23	1,544	1.0 (0.0, 6.0)	0.0 (0.0, 2.0)	0.37
ADI, Median (IQR)	6,586	48.0 (25.0, 72.0)	47.0 (25.0, 71.0)	0.02	1,514	53.0 (30.0, 73.0)	39.0 (18.0, 61.0)	0.42
N		3,284	3,302			759	755	
Smoker Ever	5,355	815 (30.0%)	823 (31.2%)	-0.02	1,211	146 (23.9%)	174 (29.0%)	-0.12
GC use at index	6,700	1,538 (45.9%)	1,095 (32.7%)	0.27	1,544	397 (51.4%)	249 (32.3%)	0.40
Cumulative GC dose among GC users (mg)*, Median (IQR)	2,633	315.0 (150.0, 780.0)	210.0 (105.0, 480.0)	0.15	646	315.0 (120.0, 740.0)	210.0 (105.0, 420.0)	0.23
N		1,538	1,095			397	249	
Oral steroid ≥200mg *	6,700	1,044 (31.2%)	636 (19.0%)	0.28	1,544	267 (34.6%)	137 (17.7%)	0.39
Medication Use *								
Colchicine	6,700	1,604 (47.9%)	0 (0.0%)	1.4	1,544	389 (50.4%)	0 (0.0%)	1.4
NSAID	6,700	1,298 (38.7%)	1,630 (48.7%)	-0.20	1,544	339 (43.9%)	254 (32.9%)	0.23
ULT	6,700	2,999 (89.5%)	0 (0.0%)	4.1	1,544	664 (86.0%)	0 (0.0%)	3.5
Any osteoporosis medication	6,700	165 (4.9%)	394 (11.8%)	-0.25	1,544	66 (8.5%)	179 (23.2%)	-0.41
Baseline Comorbidities								
Fracture	6,700	47 (1.4%)	88 (2.6%)	-0.09	1,544	15 (1.9%)	26 (3.4%)	-0.09
Osteoporosis	6,700	237 (7.1%)	516 (15.4%)	-0.27	1,544	84 (10.9%)	237 (30.7%)	-0.50
Diabetes	6,700	1,357 (40.5%)	937 (28.0%)	0.27	1,544	378 (49.0%)	176 (22.8%)	0.57
COPD	6,700	403 (12.0%)	392 (11.7%)	0.01	1,544	98 (12.7%)	64 (8.3%)	0.14
Chronic pulmonary disease	6,700	737 (22.0%)	755 (22.5%)	-0.01	1,544	205 (26.6%)	138 (17.9%)	0.21
Tophi	6,700	466 (13.9%)	0 (0.0%)	0.57	1,544	82 (10.6%)	0 (0.0%)	0.49

OA: osteoarthritis. STR: soft tissue rheumatism. SMD: standardized mean difference. SD: standard deviation. IQR: Interquartile range. BMI: body mass index. ADI: area deprivation index. GC: glucocorticoid. NSAID: nonsteroidal anti-inflammatory drug. ULT: urate lowering therapy. COPD: chronic obstructive pulmonary disease. CPD: chronic pulmonary disease.

Note: n(%), unless otherwise specified. All baseline characteristics utilized the most recent measurements prior to the index, unless otherwise specified. SMDs > 0.10 is a common threshold used to identify factors that may be clinically relevant.

* on or before index date

** Excluding gout medications

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Figure 1 : Follow-Up Nonvertebral Fracture Incidence Rates per 100 patient-years in Patients with Gout vs. Osteoarthritis*

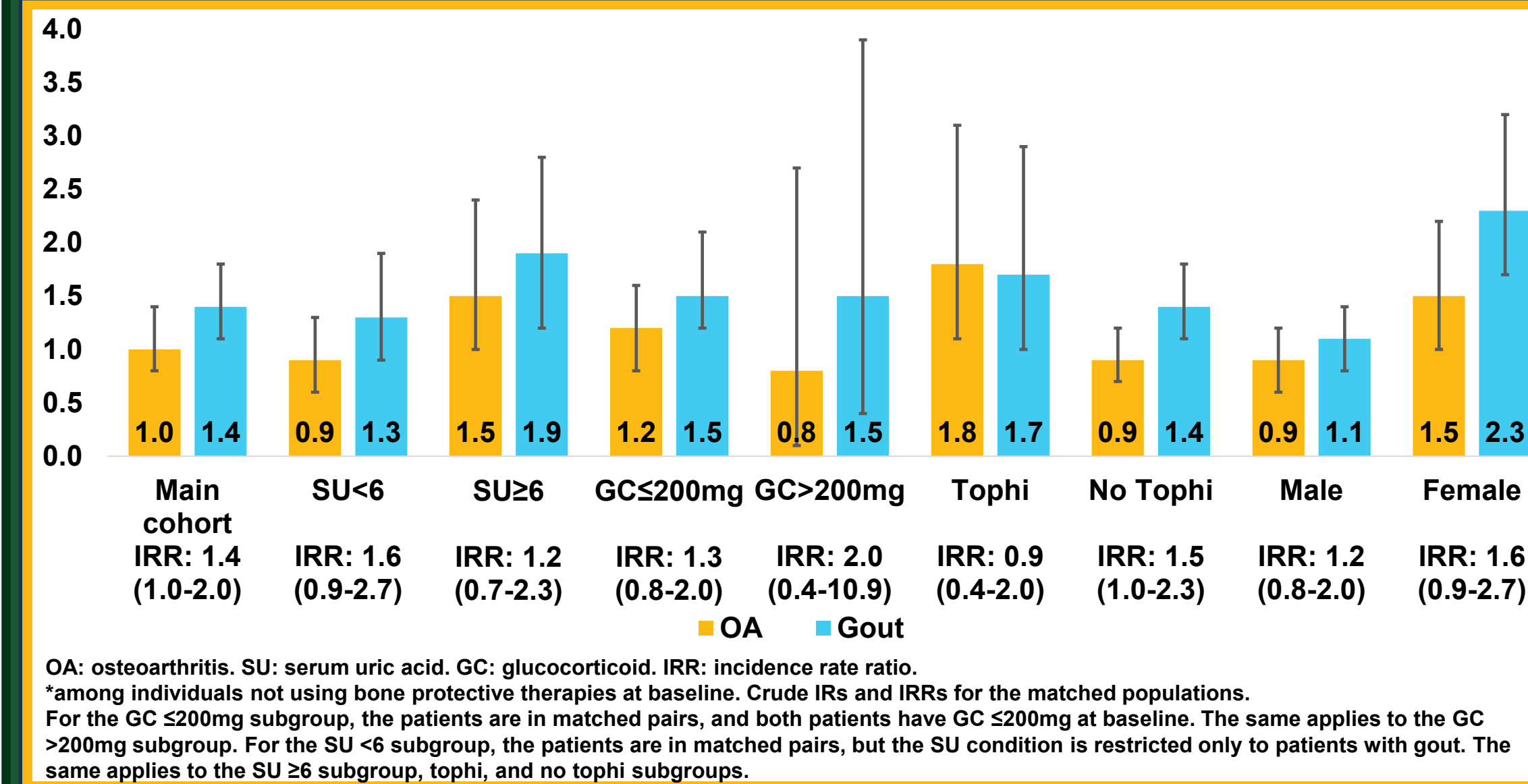


Figure 2: Nonvertebral Fracture Incidence Rates per 100 patient-years in Patients with Gout vs. Soft Tissue Rheumatism*

