$p=0.004$), -1.4 at 12 months ($n=47$, $p<0.0001$) and -4.2 at 24 months ($n=14$, $p=0.001$). Complete radiographic erosion healing was observed in only one foot joint in which a small baseline erosion disappeared on M33 radiograph. Erosion score decrease correlated with decrease of double contours at 12 months ($\rho=0.45$, $p=0.001$) and with mean SUA between M3 and M12 ($\rho=0.59$, $p=0.03$). A total of 41 joints (hand and foot DIPs, foot II-V PIPs) could not be scored due to score specifications. Prominent diaphysis erosions were seen in 6 patients and were not allowed scoring despite improvement. Bone construction and reappearance of bone contours were striking features of improved radiographs that were not measured by the score. Ankylosis of a toe joint was observed in 4 patients. Shrinking of 3 toes developed during dissolution of massive joint space/subchondral bone urate deposits.

Conclusion Urate-lowering improved gouty erosion score, in correlation with decrease of uricemia and urate crystal load. However, complete erosion recovery was seldom observed during a median follow-up of 12 months. Increased bone production and massive urate dissolution under ULD occasionally led to 2 undescribed features of gouty arthropathy: joint ankylosis and shrinking of involved toes respectively

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COMORBIDITY PATTERNS IN GOUT USING THE US GENERAL POPULATION – CLUSTER ANALYSIS OF THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY 2007-2016

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Background: Gout is associated with many metabolic and cardiorenal comorbidities. Several previous studies investigated the comorbidity patterns by cluster analysis; however, no such study has been based on

Table 1. Characteristics of Patients with Gout ($n = 8607137$)

Characteristics	Overall ($n = 8607137$)
Demographics	
Age, years (SD)	61.4 (0.6)
Body Mass Index, kg/m ² (SD)	32.0 (0.3)
Comorbidities	
Obesity (%)	4586268 (53)
Hypertension (%)	6280529 (73)
Diabetes (%)	2991109 (35)
Dyslipidemia (%)	5328364 (62)
Hypercholesterolemia (%)	5200179 (60)
Hypertriglyceridemia (%)	500382 (6)
Metabolic Syndrome (%)	4295088 (50)
Coronary Heart Disease (%)	1026990 (12)
Heart Failure (%)	976066 (11)
Cerebrovascular Disease (%)	731253 (9)
Chronic Kidney Disease (%)	1747506 (20)
Nephrolithiasis (%)	1333749 (16)
Liver Disease (%)	1559172 (18)
Malignancy (%)	1866732 (22)

the entire general population. As such, the generalizability, which is essential to these pattern analyses, remains unknown.

Objectives: We used cluster analysis on a large, representative general population sample of the United States to identify discrete phenotype patterns comorbidities observed in gout patients.

Methods: We used data from 8,607,137 participants in the 2007-2016 National Health and Nutrition Examination Survey (NHANES), a nationally representative sample of adults in the United States. Diagnosis of gout was based on survey of physician- or health professional-diagnosed gout. We used cluster analysis to identify subgroups among participants with gout with distinct comorbidity subgroups based on 9 variables: obesity, hypertension, diabetes, hypercholesterolemia, hypertriglyceridemia, coronary heart disease (CHD), heart failure (HF), chronic kidney disease (CKD), and liver disease.

Results: Cluster analysis identified 5 different subgroups (C1-C5) (Table 2). C1 had the highest proportion of patients with CKD (97%). C2 consisted of patients with gout but few other comorbidities. All patients in C3 had diabetes, but no HF, CHD, or CKD. C4 consisted primarily of patients with liver disease (85%), with high prevalences of lipid abnormalities and obesity. C5 had the highest proportion of patients with CHD and HF.

Conclusion: These findings from a nationally representative data of US adults indicate that gout comorbidities have 5 distinctive phenotypic patterns. These subgroups may have implications in pathogenesis of gout and/or for personalized care in the management of gout and comorbidities.

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Table 2. Clustering of Patients with Gout Based on Comorbidities

Characteristics	C1 ($n = 1257504$)	C2 ($n = 3455594$)	C3 ($n = 1199819$)	C4 ($n = 1430528$)	C5 ($n = 1263692$)
Demographics					
Age (Years)	68.9 (0.9)	58.5 (0.8)	62.2 (1.0)	56.2 (1.2)	66.9 (0.9)
Male gender (%)	831369 (66%)	2342105 (67%)	868002 (72%)	986610 (69%)	815468 (64%)
Body Mass Index (kg/m ²)	31.6 (0.5)	30.7 (0.3)	34.5 (0.9)	33.1 (0.8)	32.2 (0.6)
Comorbidities					
Obesity	644864 (51%)	1634488 (47%)	841074 (70%)	857774 (60%)	608068 (48%)
Hypertension	990667 (79%)	2098496 (61%)	919843 (77%)	1169545 (82%)	1101979 (87%)
Diabetes	519609 (41%)	0 (0%)	1199819 (100%)	562870 (39%)	708811 (56%)
Hypercholesterolemia	766072 (61%)	1880096 (54%)	767170 (64%)	1003052 (70%)	783789 (62%)
Hypertriglyceridemia	6584 (0.5%)	9440 (0.3%)	54026 (5%)	411456 (29%)	18876 (2%)
Coronary Heart Disease	20621 (2%)	0 (0%)	0 (0%)	66088 (5%)	940281 (74%)
Heart Failure	219615 (18%)	2434 (0.1%)	0 (0.0%)	12845 (0.9%)	741172 (59%)
Chronic Kidney Disease	1217813 (97%)	0 (0.0%)	0 (0.0%)	210085 (15%)	319608 (25%)
Liver Disease	9216 (0.7%)	80403 (2%)	33896 (3%)	1216843 (85%)	218814 (17%)