

A COMPARISON OF AVERAGE ANNUAL MEDICAL SERVICES FOR COMORBID CONDITIONS ASSOCIATED WITH METABOLIC SYNDROME FOUND IN EMPLOYEES WITH GOUT VERSUS THOSE WITHOUT GOUT

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BACKGROUND

- Gout is a progressive disease that is increasing in prevalence in managed care populations¹
- Gout is characterized as an inflammatory arthritis caused by urate crystal deposition in joints and soft tissue.
- Gout is associated with hyperuricemia. This latter condition is defined by current laboratory reference levels as > 7.0 mg/dL in men and postmenopausal women and > 6.0 mg/dL in premenopausal women¹
- Gout ultimately develops in approximately one-third of patients with asymptomatic hyperuricemia, and is thought to affect approximately 5.1 million U.S. adults²
- Hyperuricemia and gout are complexly associated with the clustering of conditions defined as the metabolic syndrome, the latter identified by the factors of 1) abdominal obesity, 2) atherogenic dyslipidemia, 3) hypertension, 4) insulin resistance, 5) a proinflammatory state, and 6) a prothrombotic state³
- Metabolic syndrome is a predictor of type 2 diabetes mellitus and cardiovascular disease³

OBJECTIVE

- To compare the average annual medical services associated with metabolic syndrome among employees with gout and without gout.

METHODS

- A retrospective analysis was performed using data from the Human Capital Management Services Research Reference Database (HCMS RRDb) of approximately 300,000 employees using 2001-2004 adjudicated claims and demographics.
- The index date for employees with gout was that first associated with an International Classification of Diseases-9 (ICD-9) code of 274.xx. For the control, non-diseased group, an average index date was derived from that found for the gout cohort.
- Mean annual utilization of services for the 261 specific Agency for Healthcare Research and Quality (AHRQ) diagnostic categories were determined for employees with gout versus those without gout using services related to associated ICD-9 codes. Mean service utilization was calculated during the year following the index date.
- A medical service was counted for each unique procedure, and several medical services could occur per visit.

DATA ANALYSIS

- Using logistic regression and a propensity score matching algorithm, a control group of employees without gout was matched (50:1) to the employees with gout, matching on age, years with the employer, gender, marital status, race, exempt status (salary versus non-salary), full-time/part-time status, annual salary, and first Zip Code digit.
- Means and standard errors of demographic data and service utilization data were compared using *t*-tests.

RESULTS

- Data were available for 1,171 employees with gout and a matched control of 58,550 employees without gout.
- Services related to the AHRQ specific diagnostic conditions of "hyperlipidemia" and "hypertension" were found commonly in both cohorts (2nd and 3rd highest occurring in employees with gout versus 2nd and 5th in employees without gout, respectively), and both conditions had significantly more services among employees with gout than among employees without gout ($P < 0.001$).
- Services for "diabetes mellitus without complications," a frequent sequelae of metabolic syndrome, were also significantly more common among employees with gout versus those without gout (8th and 10th highest respectively, $P < 0.001$).
- Medical services associated with "coronary atherosclerosis," another possible sequelae of metabolic syndrome were non-significantly higher among employees with gout ($P = 0.0959$), and services related to this category were found to be the 15th highest of the 261 AHRQ categories.

REFERENCES

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TABLE 1: DEMOGRAPHICS FOR THE MATCHED SAMPLE

VARIABLE	WITH GOUT		WITHOUT GOUT ¹		Δ	SIGNIFICANCE ($P < 0.05$)
	N	MEAN	N	MEAN		
Age (in years)	1,171	45.9	58,550	45.6	0.358	No
Tenure (in years)	1,171	12.8	58,550	12.7	0.096	No
Male (%)	1,171	85.0%	58,550	85.4%	0.004	No
Married (%)	1,087	66.1%	54,326	66.2%	-0.002	No
Race (%)						
White	736	71.7%	37,022	71.8%	-0.001	No
Black	736	15.5%	37,022	15.4%	0.001	No
Hispanic	736	5.8%	37,022	5.9%	-0.001	No
Exempt (%)	1,171	36.0%	58,550	35.9%	0.001	No
Full-time/part-time status (%)	1,171	94.4%	58,550	94.2%	0.002	No
Annual Salary	1,171	\$61,361	58,550	\$60,292	1069	No

¹ Cohorts were matched using a propensity score matching algorithm (50:1), matched on age, tenure (years with the employer), age, gender, marital status, race, exempt status (salary versus non-salary), full-time, part-time status, annual salary, and 1st digit of the Zip Code. Abbreviations: Δ, incremental difference between means; n, sample size

TABLE 2: THE TOP TEN AHRQ SPECIFIC DIAGNOSTIC CATEGORIES BY MEAN ANNUAL MEDICAL SERVICES PER EMPLOYEE WITH GOUT (DURING THE YEAR FOLLOWING THE SUBJECT'S INDEX DATE)¹

AHRQ DIAGNOSTIC CATEGORY	WITH GOUT (N=1,171)		WITHOUT GOUT (N=58,550) ²		P-VALUE ³
	MEAN SERVICES	OVERALL RANK	MEAN SERVICES	OVERALL RANK	
Intervertebral disc disorders	3.03	1	2.07	1	0.1147
Hyperlipidemia	2.21	2	0.95	2	< 0.0001
Essential hypertension	1.97	3	0.75	5	< 0.0001
Other connective tissue diseases	1.74	4	0.83	4	< 0.0001
Other non-traumatic joint disease	1.67	5	0.47	7	< 0.0001
Sprains and strains	1.46	6	0.71	6	0.0278
Chronic renal failure	1.44	7	0.07	72	0.0711
Diabetes mellitus without complications	1.14	8	0.42	10	< 0.0001
Medical exam/evaluation	1.04	9	0.90	3	0.1443
Other nervous system disorders	0.73	10	0.37	15	0.0012

Areas in bold represent metabolic syndrome-like categories

- For employees with gout, the index date is the date of the first gout diagnosis (ICD-9-274.xx) in the study period. For employees without gout, the index date is the average index date based on the group of employees with disease.
- Cohorts were matched using a propensity score matching algorithm (50:1), matched on age, tenure (years with the employer), age, gender, marital status, race, exempt status (salary versus non-salary), full-time, part-time status, annual salary, and 1st digit of the Zip Code.
- P-values less than 0.05 are considered statistically significant

CONCLUSIONS

- Medical services related to hyperlipidemia and hypertension (disease states that are associated with metabolic syndrome), and the conditions of diabetes and cardiovascular disease (possible post complications of metabolic syndrome) are utilized more often in employees with gout versus those without.
- The results support the suggestion that gout may be associated with other underlying metabolic disease.
- Gout is a serious and progressive disease that is associated with multiple metabolic comorbidities.