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ORIGINAL RESEARCH

Health care costs in US patients with and without a diagnosis of osteoarthritis

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Background: Osteoarthritis is a chronic and costly condition affecting 14% of adults in the US, and has a significant impact on patient quality of life. This retrospective cohort study compared direct health care utilization and costs between patients with osteoarthritis and a matched control group without osteoarthritis.

Methods: MarketScan® databases were used to identify adult patients with an osteoarthritis claim (ICD-9-CM, 715.xx) in 2007, and the date of first diagnosis served as the index. Patients were excluded if they did not have 12 months of continuous health care benefit prior to and following the index date, were aged <18 years, or lacked a second diagnosis code for osteoarthritis between 15 and 365 days pre-index or post-index. Osteoarthritis patients were matched 1:1 to patients without osteoarthritis for age group, gender, geographic region, health plan type, and Medicare eligibility. Multivariate analyses were conducted to assess for differences in utilization and costs, controlling for differences between cohorts.

Results: The study sample included 258,237 patients with osteoarthritis and 258,237 matched controls without osteoarthritis. Most patients were women and over 55 years of age. Patients with osteoarthritis had significantly higher pre-index rates of comorbidity than controls. Mean total adjusted direct costs for osteoarthritis patients were more than double those for the control group at US$18,435 (95% confidence interval [CI]: US$18,318–US$18,560) versus US$7494 (95% CI: US$7425–US$7557). Osteoarthritis patients incurred significantly higher inpatient costs at US$6668 (95% CI: US$6587–US$6744) versus US$1756 (95% CI: US$1717–US$1794), outpatient costs at US$7840 (95% CI: US$7786–US$7902) versus US$3675 (95% CI: US$3637–US$3711), and prescription drug costs at US$3213 (95% CI: US$3195–US$3233) versus US$2245 (95% CI: US$2229–US$2262) compared with the controls.

Conclusion: The direct health care costs of osteoarthritis patients were over two times higher than those of similar patients without the condition. The primary drivers of the cost difference were comorbidities and inpatient costs.

Keywords: osteoarthritis, health care costs, health care utilization, comorbidities

Introduction

Osteoarthritis is a debilitating joint disease characterized by joint pain, joint inflammation, stiffness, and functional disability.[1] It is estimated that approximately 14% of US adults are affected by osteoarthritis, and of these, 33.6% are aged 65 years or older.[2] The prevalence of osteoarthritis is rapidly increasing, and this is likely a result of the aging population and an increase in the prevalence of obesity.[1,3] During the decade from 1995 to 2005, the number of Americans with osteoarthritis increased from about 21 million to 27 million.[4]

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Osteoarthritis is a leading cause of disability among US adults, and has a significant and negative impact on quality of life, with many patients experiencing fatigue, decreased sleep quality, reduced mental health, social function, and work productivity.[5] Additionally, rates of comorbidities are high among this population, with depression, hypertension, cardiovascular disease, respiratory disease, diabetes, and renal disease being the most frequently reported conditions.[1] These conditions together with osteoarthritis further impair patient quality of life.

The economic burden associated with osteoarthritis is substantial. White et al calculated the average total direct medical costs for adults with osteoarthritis in 2005 US currency to be $11,542.[1] Using nationally representative survey data, it was estimated that, in the presence of osteoarthritis, predicted annual insurer and patient out-of-pocket costs increased by US$4833 and US$1379 for women, respectively, and by US$4036 and US$694 for men, respectively.[6] In another retrospective analysis of a large insurance claims database by Dunn and Pill, the mean charge per patient per year for osteoarthritis-related services was $5938 in 2007 US currency.[7]

With the increasing prevalence of osteoarthritis and increasing costs of health care, it is important to understand the health care utilization and costs associated with this condition. Although a handful of studies detailing the cost of illness of osteoarthritis in the US has been published, the majority of these studies utilized data from the 1990s or data from a single health plan, which limits the generalizability of the results.[6,8] Few recent studies assessing the economic burden of this common condition have been conducted,[9] none of which compared costs incurred by osteoarthritis patients with controls.

The main objective of the current study was to compare the direct health care costs of osteoarthritis in affected patients and matched controls to determine the health care resource utilization and cost burden associated with osteoarthritis using a US research database. A secondary objective was to identify the drivers of cost in patients with osteoarthritis.

Materials and methods

Deidentified health insurance claims from January 1, 2006 to December 31, 2009, drawn from the *Thomson Reuters MarketScan® Commercial and Medicare Supplemental Databases* were used retrospectively to analyze the direct health care costs of patients with osteoarthritis and matched controls without osteoarthritis. The MarketScan databases are compiled from insurance claims of individuals with health care coverage provided by over 100 employer-sponsored and private health plans located throughout the US. Data from employees and their dependants are contained in the *MarketScan Commercial Database*, while the *MarketScan Medicare Supplemental Database* contains data from Medicare beneficiaries with comprehensive employer-sponsored supplemental coverage. The databases include fully adjudicated claims that provide detailed utilization and cost information from inpatient and outpatient settings, including retail and mail order pharmacies. The *MarketScan Medicare Database* is limited to plans where both the Medicare-paid and employer-paid amounts are available to help ensure that patient claim histories are complete.

The osteoarthritis cohort was selected from patients with an osteoarthritis diagnosis (ICD-9-CM, 715.xx) on an inpatient or outpatient claim in 2007, with the date of first diagnosis as the index date. To ensure sample specificity, at least one additional osteoarthritis diagnosis on or between 15 and 365 days pre-index or post-index was required. A shorter timeframe for the confirmatory diagnosis may have erroneously included rule-out diagnoses as evidence of the disease; a longer timeframe was not possible given the pre- and post-periods employed in the study. Laboratory and radiology claims were not used to identify the study sample because they may carry rule-out diagnoses. Patients without continuous enrollment with medical, prescription drug, and mental health coverage over the 12 months pre- and post-index periods, or patients younger than 18 years as of the index date were excluded. The remaining patients comprised the osteoarthritis cohort.

Osteoarthritis patients were matched 1:1 to controls without osteoarthritis. A power analysis determined a 1:1 match ratio would detect a minimal (≥2%) difference in total costs between cohorts with a power of 92%. Power of 90%–95% is a reasonable goal in most research contexts.[10] Controls were selected from adults with no osteoarthritis claims in 2006 through 2008 and at least 24 months of continuous enrollment with medical, prescription drug, and mental health coverage over the study period. Controls were directly matched to osteoarthritis patients on age group, gender, geographic region, health plan type, and Medicare eligibility. Index dates were assigned to controls based on the index date distribution for osteoarthritis patients.

Patient demographics and clinical characteristics were identified from the database. Demographic variables were defined as of the index date, and included age, gender, geographic region, and health plan characteristics. The Deyo adaptation of the Charlson Comorbidity Index (CCI)[11] was

calculated in the 12 month pre-index period. A CCI score of zero suggests a patient has no or minimal comorbid burden, while scores of 1–4 indicate moderate burden and scores of ≥5 indicate substantial burden.[12] Bivariate measures were created to measure the presence of select medical, psychiatric, and pain comorbidities. The list of comorbidities was chosen to complement the CCI, and included conditions shown in previous research[1] to be prevalent among osteoarthritis patients (eg, hypertension, diabetes), conditions that may be associated with the osteoarthritis disease process or severity (eg, obesity, injuries) and conditions that may represent sequelae of osteoarthritis treatment (eg, peptic ulcer). The presence of these conditions may impact health care costs, so these measures were primarily created for use in the multivariate adjustment of health care costs. For all comorbidities, claims for laboratory and radiology services were not considered.

Medical utilization was measured over the 12-month post-index period and included medical and pharmacy services for all osteoarthritis-related and non-osteoarthritis-related services. Medical services included inpatient (facility and professional services associated with an inpatient admission), emergency department (defined based on place of service codes present in the database), and outpatient (all services not defined as inpatient, emergency department or pharmacy, which included services provided in physician offices, free-standing clinics, and hospital outpatient departments). Osteoarthritis-related services were defined as claims with a diagnosis code for osteoarthritis or medications used in the management of osteoarthritis. Indication is not recorded on drug claims, and medications can have multiple uses, so osteoarthritis-related medication categorization is not exact. The final medication class list was based on review of previous research[7] and clinician input, and included opioids, tramadol, nonsteroidal anti-inflammatory drugs, topical analgesics, other analgesics not elsewhere classified, cyclooxygenase-2 (COX-2) inhibitors, proton pump inhibitors/H2 blockers, intra-articular injections, muscle relaxants, anticonvulsants, antidepressants, benzodiazepines (eg, estazolam, flurazepam, temazepam) and nonbenzodiazepine sedative hypnotics (eg, ramelteon, zaleplon, zolpidem). Individual medications within each class were identified using Red Book™ drug class codes.

The primary study outcome was direct health care costs, which were determined by summing the paid amounts (including both the health plan and patient portions) on relevant claims. Costs for services provided under capitated arrangements were estimated using payment proxies computed across all claims in the MarketScan databases. Payment proxies were used to assign a gross pay amount to capitated services. Proxy payments were specific to region, year, and current procedural terminology codes, and were generated using noncapitated data. The medical care component of the US Consumer Price Index was used to adjust costs to December 2008 US dollars.

Bivariate descriptive analyses were conducted to characterize the study population in terms of all demographic, comorbidity, medical utilization, and cost measures. Patient counts and percentages were reported for categorical variables, while mean and standard deviation were presented for continuous variables. Statistically significant differences between the osteoarthritis and nonosteoarthritis cohorts were tested using Chi-square tests for categorical variables and t-tests for continuous variables. A critical value of $P < 0.05$ was set a priori as indicative of a significant difference between cohorts.

Multivariate analyses were conducted to estimate inpatient costs, outpatient costs, outpatient prescription drug costs, and total costs controlling for differences between cohorts that remained after matching. Emergency department costs and the individual components of outpatient costs (eg, primary care physician office visits, physical/occupational therapy) were not modeled separately because an initial descriptive review of cost data revealed these costs to be minimal. However, these costs were included when modeling total costs. Model covariates included demographic variables from Table 1, as well as select comorbidities listed in Table 2. Comorbidities included in the model were selected using stepwise regression with backward selection; variables with a P value ≤ 0.1 were used as model covariates. Generalized linear model regressions with log link and gamma variance functions were constructed for total and prescription drug costs. Two-part models, ie, logistic regressions of positive costs followed by generalized linear model regressions of costs for patients with positive costs, were used for inpatient costs because many patients were not hospitalized. Park tests and Akaike's information criterion were used to select the most appropriate variance functions in the models. The recycled prediction simulation was used to estimate and compare marginal effects without removing the risk factors from the model; as a result, it was used to determine the impact of osteoarthritis diagnosis on health care costs, adjusting for patient characteristics. The 95% confidence intervals (CI) around the mean adjusted costs were determined using a bootstrapping method with 500 iterations. The differences between the two full sample averages reflect the net effects of osteoarthritis status on health care costs.

Table 1 Study sample selection

	n	Percentage
• Patients with at least one OA diagnosis from January 1, 2007 through December 31, 2007	1,010,071	100%
• Age 18 years or older at first OA diagnosis	1,007,532	99.7%
• Continuous enrollment and pharmacy benefits ≥12 months before first OA diagnosis	471,205	46.7%
• Continuous enrollment and pharmacy benefits ≥12 months after first OA diagnosis	470,416	46.6%
• Mental health benefits ≥12 months before first OA diagnosis	421,627	41.7%
• Mental health benefits ≥12 months after first OA diagnosis	420,889	41.7%
• Second OA diagnosis on/between 15 and 365 days pre- and post-index	259,886	25.7%
Total number of eligible patients for OA cohort	259,886	25.7%
Total number of matched OA patients	258,237	25.6%
Total number of non-OA controls	258,237	

Notes: OA patients were directly matched 1:1 to control patients with no evidence of OA on the basis of age group, gender, geographic region, health plan type, and Medicare eligibility. OA patients for whom a match could not be located were dropped from the sample.
Abbreviation: OA, osteoarthritis.

Results

A total of 1,010,071 patients in the *MarketScan Commercial and Medicare Supplemental Databases* had an osteoarthritis claim in 2007 (Table 1). After excluding patients without a confirmatory osteoarthritis diagnosis (16%), patients without pre-index and post-index continuous enrollment (58%) and patients under the age of 18 years at index (<1%), the remaining osteoarthritis patients (26%) were matched to

controls without osteoarthritis. The final study sample included 258,237 osteoarthritis patients and an equivalent number of controls.

Patient demographic characteristics are presented in Table 2. Per study design, most patient characteristics (ie, age group, gender, geographic region, health plan type, and Medicare eligibility) were the same for both cohorts. The cohorts were predominantly female (64.2%), and about 83%

Table 2 Demographic characteristics

	OA patients n = 258,237		Controls n = 258,237		*P* value
Age (mean, SD)	67.0	12.9	66.3	12.9	<0.05
Age group (n, %)					0.999
18–34	1563	0.6%	1563	0.6%	
35–44	7380	2.9%	7380	2.9%	
45–54	34,950	13.5%	34,950	13.5%	
55–64	81,007	31.4%	81,007	31.4%	
65–74	50,405	19.5%	50,405	19.5%	
75+	82,932	32.1%	82,932	32.1%	
Gender (n, %)					0.999
Male	92,345	35.8%	92,345	35.8%	
Female	165,892	64.2%	165,892	64.2%	
Geographic region (n, %)					0.999
North Central	90,412	35.0%	90,412	35.0%	
Northeast	25,255	9.8%	25,255	9.8%	
South	95,361	36.9%	95,361	36.9%	
West	46,343	17.9%	46,343	17.9%	
Unknown	866	0.3%	866	0.3%	
Health plan type (n, %)					0.999
Comprehensive	103,499	40.1%	103,499	40.1%	
Exclusive provider organization	444	0.2%	444	0.2%	
Health maintenance organization	34,097	13.2%	34,097	13.2%	
Preferred provider organization	18,705	7.2%	18,705	7.2%	
Point of service	96,714	37.5%	96,714	37.5%	
Point of service with capitation	1118	0.4%	1118	0.4%	
Consumer driven health plan	1647	0.6%	1647	0.6%	
Unknown	2013	0.8%	2013	0.8%	
Medicare coverage (n, %)	129,292	50.1%	129,292	50.1%	0.999

Abbreviations: OA, osteoarthritis; SD, standard deviation.

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of patients were over the age of 55 years. Most patients resided in the North Central (35%) and South (36.9%) regions. The majority of patients were enrolled in a comprehensive (40.1%) or preferred provider organization (37.5%) health plan. Slightly over half (50.1%) of the patients were eligible for Medicare.

Osteoarthritis patients had a greater comorbid burden than demographically matched controls, as evidenced by the higher mean CCI score for osteoarthritis patients in the pre-index (0.87 versus 0.61, $P < 0.05$, Table 3). Osteoarthritis patients also had significantly higher rates of all assessed individual comorbidities compared with controls. Common pre-index medical conditions in the osteoarthritis cohort included hypertension (44.8%), cardiovascular disease (29.0%), and diabetes (17.0%). These conditions also affected the controls, although at lower rates (32.5%, 20.4%, and 12.6%, respectively; all $P < 0.05$). Two to three times as many osteoarthritis patients as controls had claims in the 12 months pre-index for pain conditions other than osteoarthritis, including low back pain (17.7% versus 6.9%), neuropathic pain (4.3% versus 1.4%), inflammatory arthritis (4.5% versus 1.2%), and fibromyalgia (3.9% versus 1.2%),

all of which were statistically significant ($P < 0.05$). Depression was present pre-index among 6.4% of osteoarthritis patients compared with 3.4% of controls.

More osteoarthritis patients than controls utilized health care services in the 12 months post-index (Table 4). Nearly one-third (32.5%) of osteoarthritis patients incurred a hospitalization, compared with only 8.6% of controls ($P < 0.05$). More osteoarthritis patients than controls had a physician office visit with a primary care provider (88.7% versus 64.8%, $P < 0.05$) and a specialist (85.5% versus 48.6%, $P < 0.05$). Physical or occupational therapy was also utilized by more osteoarthritis patients than controls (43.6% versus 11.7%, $P < 0.05$). The majority of patients in both cohorts filled prescriptions during the post-index period, but there were more patients with at least one drug claim in the osteoarthritis cohort than in the control cohort (96.3% versus 86.7%, $P < 0.05$). Pain-related medications were used by 86.9% of osteoarthritis patients compared with 52.6% of controls ($P < 0.05$).

Examination of the coefficients in the cost models (Table 5) revealed that a higher CCI score and presence of the majority of the pre-index comorbidities examined were

Table 3 Comorbidities over the 12 month pre-index period

	OA patients n = 258,237		Controls n = 258,237	
CCI[a] (mean, SD)	0.87	1.34	0.61	1.19
Medical conditions[b] (n, %)				
Hypertension	115,572	44.8%	83,826	32.5%
Cardiovascular disease	74,930	29.0%	52,585	20.4%
Diabetes	43,812	17.0%	32,450	12.6%
Peptic ulcer or gastritis	9177	3.6%	4,723	1.8%
Obesity	5049	2.0%	1539	0.6%
Insomnia	4947	1.9%	2561	1.0%
Kidney disease	4176	1.6%	2893	1.1%
Liver disease	3707	1.4%	2511	1.0%
Seizure or epilepsy	2729	1.1%	1984	0.8%
Psychiatric conditions (n, %)				
Depression	16,413	6.4%	8851	3.4%
Alcohol use disorder	532	0.2%	289	0.1%
Pain conditions[b] (n, %)				
Joint pain/arthralgia	96,410	37.3%	18,504	7.2%
Injuries	76,984	29.8%	36,399	14.1%
Low back pain	45,749	17.7%	17,891	6.9%
Neuropathic pain	11,061	4.3%	3682	1.4%
Inflammatory arthritis[c]	11,593	4.5%	3019	1.2%
Fibromyalgia	10,183	3.9%	3025	1.2%
Migraine	4757	1.8%	2778	1.1%

Notes: All comparisons were statistically significant with a *P* value < 0.05. [a]Charlson Comorbidity Index, Deyo adaptation, calculated over 12 months pre-index; [b]presence of ≥one claim with a diagnosis code indicative of the condition in the 12 months pre-index; [c]includes rheumatoid arthritis, ankylosing spondylitis or psoriatic arthropathy. **Abbreviations:** CCI, Charlson Comorbidity Index; OA, osteoarthritis; SD, standard deviation.

Table 4 Health care utilization over the 12-month post-index period

	OA patients n = 258,237		Controls n = 258,237	
Patients with services (n, %)				
Hospitalizations	84,010	32.5%	22,133	8.6%
Emergency department	72,147	27.9%	50,133	19.4%
Office visit, primary care	229,001	88.7%	167,442	64.8%
Office visit, specialist	220,734	85.5%	125,457	48.6%
Physical/occupational therapy	112,650	43.6%	30,105	11.7%
All medications	248,594	96.3%	223,969	86.7%
Pain-related medications[a]	224,427	86.9%	135,924	52.6%
Number of services (mean, SD)				
Hospitalizations	0.4	0.7	0.1	0.4
Emergency department	0.5	1.2	0.3	1.0
Office visit, primary care	5.5	5.3	2.4	3.2
Office visit, specialist	5.3	5.4	1.9	3.5
Physical/occupational therapy	5.0	9.7	1.0	4.6
All medications	36.2	30.0	22.0	24.1
Pain-related medications[a]	11.9	14.1	4.3	8.1

Notes: All comparisons were statistically significant with a *P* value < 0.05. [a]Includes the following medications that may be used to treat osteoarthritis symptoms: opioids, tramadol, nonsteroidal anti-inflammatory drugs, topical analgesics, other analgesics not elsewhere classified, cyclooxygenase-2 (COX-2) inhibitors, proton pump inhibitors/H2 blockers (may be prescribed for gastroprotection), intra-articular injections, muscle relaxants, anticonvulsants, antidepressants, benzodiazepines, and nonbenzodiazepine sedative hypnotics. These mediations may have other indications as well. Medications not resulting in an outpatient claim (eg, over-the-counter products) were not counted. **Abbreviations:** OA, osteoarthritis; SD, standard deviation.

associated with significantly increased costs. Mean total adjusted direct costs for osteoarthritis patients were US$18,435 (95% CI: US$18,318–US$18,560) in the 12 months post index, ie, more than double the US$7494 (95% CI: US$7425–US$7557) incurred by controls (Table 6). Inpatient costs were estimated at US$6668 (95% CI: US$6587–US$6744) for osteoarthritis patients and US$1756 (95% CI: US$1717–US$1794) for controls. Mean outpatient costs were US$7840 (95% CI: US$7786–US$7902) for osteoarthritis patients and US$3675 (95% CI: US$3637–US$3711) for the control group. Mean outpatient pharmacy costs were US$3213 (95% CI: US$3195–US$3233) for osteoarthritis patients and US$2245 (95% CI: US$2229–US$2262) for controls.

Discussion

This study was conducted to compare the direct health care costs of osteoarthritis patients and a demographically matched control group to determine the cost burden associated with osteoarthritis. This study adds to the existing body of literature on the burden of osteoarthritis by assessing detailed health care utilization and costs in comparison with patients without the condition. Results showed that the direct health care costs of osteoarthritis patients were more than double the cost for similar patients without the condition. Higher inpatient costs among osteoarthritis patients were the primary driver of the cost difference. Additionally, the presence of pre-index comorbidities was associated with higher total costs.

In this retrospective analysis, osteoarthritis patients incurred annual total direct costs that were $10,941 higher, on average, than similar patients without osteoarthritis (in 2008 US currency). This differential is larger than that presented in previous studies. Kotlarz et al found osteoarthritis increased annual costs by $4730 to $6212 (2007 US currency), depending on gender.[6] However, that study did not include all medical services, such as physical and occupational therapy, which may account for some of the difference. Mapel et al noted that total costs for osteoarthritis patients were more than double those of controls,[13] a finding that is consistent with the current study.

As in previous studies, inpatient admissions were a driver of costs among osteoarthritis patients. In this study, mean annual inpatient costs comprised about 36% of the total costs. Hospitalizations accounted for 37% of total costs for osteoarthritis patients included in the retrospective claims analysis

Table 5 Generalized linear model regression of all-cause total health care costs

	Coefficient[a]	Standard error
Key independent variable		
Controls (reference)		
OA patients	0.900	0.005*
Age	0.010	0.000*
Gender		
Male (reference)		
Female	−0.053	0.005*
Urbanicity		
Rural or unknown (reference)		
Urban	0.003	0.006
Region		
South (reference)		
Northeast	−0.020	0.009*
North Central	−0.022	0.006*
West	0.044	0.008*
Unknown	−0.232	0.043*
Health plan type		
Comprehensive (reference)		
Exclusive provider organization	0.071	0.060
Health maintenance organization	−0.042	0.010*
Point of service	−0.018	0.011
Preferred provider organization	0.031	0.007*
Point of service with capitation	−0.189	0.040*
Consumer driven health plan	0.011	0.032
Unknown	0.150	0.029*
Capitation status		
Not capitated (reference)		
Capitated	0.165	0.013*
Medicare	−0.217	0.009*
Charlson Comorbidity Index	0.175	0.003*
Preperiod comorbidities		
Peptic ulcer/gastritis	0.161	0.015*
Kidney disease	0.372	0.022*
Liver disease	0.327	0.023*
Hypertension	0.131	0.005*
Obesity	0.183	0.022*
Insomnia	0.112	0.021*
Diabetes	0.097	0.008*
Cardiovascular disease	0.259	0.006*
Seizure or epilepsy	0.301	0.026*
Depression	0.306	0.012*
Alcohol use disorder	0.168	0.063*
Neuropathic pain	0.166	0.015*
Lower back pain	0.224	0.008*
Migraine	0.281	0.021*
Inflammatory arthritis	0.282	0.015*
Injuries	0.122	0.006*
Joint pain/arthralgia	0.138	0.006*
Constant	7.871	0.023*

Notes: *Significant with $P < 0.05$; [a]Positive coefficient indicates increase in cost, while negative coefficient indicates decrease in cost.

Table 6 Regression-adjusted health care costs over the 12 month post-index period

	OA patients			Controls		
	Mean	**95% CI**		**Mean**	**95% CI**	
Inpatient costs	$6668	$6587	$6744	$1756	$1717	$1794
Outpatient costs	$7840	$7786	$7902	$3675	$3637	$3711
Rx costs	$3213	$3195	$3233	$2245	$2229	$2262
Total costs	$18,435	$18,318	$18,560	$7494	$7425	$7557

Notes: Nonoverlapping confidence intervals indicate that the means are significantly different. All amounts are in US dollars.
Abbreviations: CI, confidence interval; OA, osteoarthritis.

by White et al.[1] Similarly, Dunn and Pill reported 40% of the estimated total charges were from inpatient services.[7] Mapel et al also found that osteoarthritis patients were nearly four times more likely to have a hospitalization than controls.[13]

This study found the health care utilization rates of osteoarthritis patients to be significantly greater than those of the control group across all service categories. Furthermore, osteoarthritis patients had significantly more comorbidity compared with controls. Mapel et al determined that although osteoarthritis patients incurred more hospitalizations than controls, only about half the hospitalizations were for musculoskeletal diagnoses.[13] They found that outpatient neurology, gastroenterology, and mental health-related outpatient utilization was nearly double that of controls without osteoarthritis, suggesting a considerable portion of the incremental burden of osteoarthritis is due not to the condition itself but to comorbidities.

The current study has some limitations which must be considered when interpreting the results. Absence of an osteoarthritis code in the claims histories of control patients does not necessarily mean some of these patients did not have osteoarthritis; patients could have untreated osteoarthritis symptoms or be under treatment without having the condition coded on their insurance claims. Comorbid conditions may have been underreported for similar reasons. Cost differences between cohorts could be due to unobserved factors not controlled for through matching and multivariate regressions. Costs not resulting in a health plan claim (eg, over-the-counter medications, services covered entirely by Medicare and not submitted to the supplemental insurer) are not included in the database and, thus, could not be tallied for either osteoarthritis patients or controls. Study results were derived from commercially insured patients and may not be generalizable to patients with Medicaid coverage or the uninsured. Additionally, as with most previous research,[8] this study did not stratify the osteoarthritis sample by primary site of osteoarthritis (eg, knee versus wrist/hand) but rather summarized costs across all osteoarthritis patients. Thus, the study results are likely driven by the most prevalent types of osteoarthritis.

Conclusion

Results from this retrospective cohort study show that the health care resource utilization and cost burden associated with osteoarthritis is substantial. Overall, the commercially insured osteoarthritis patients in this study utilized more health care resources and cost significantly more than their matched controls. The primary cost drivers were comorbidities and inpatient costs.

Disclosure

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