Comparing Healthcare Costs and Utilization in Osteoarthritis Patients With Different Levels of Treatment-Based Severity: An 18-Year Retrospective Study

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Objectives

While treatment algorithms and guidelines exist for osteoarthritis (OA), it is challenging to classify OA severity to study treatment approaches. Our goal was to stratify OA patients using a treatment-based severity definition and compare healthcare utilizations and costs.

Methods

This was a retrospective study from 2001-2018 at a large U.S. integrated health system.

- Inclusion Criteria: Patients aged 18+ with ≥1 month of insurance and diagnosis code for OA (ICD-9: 715.*, ICD-10 M15-19) or joint surgery.
- Patients were categorized as mild OA at index date and moderate-severe OA when any of eight literature-based criteria were met (hip/knee procedure, two anxiety/depression encounters, two prescriptions for opioid or nonsteroidal anti-inflammatory drug, two intra-articular injections, mobility aid, physical therapy referral, or two x-rays), thus forming one or two observation periods per patient.
- All-cause outpatient visits (OP), emergency department visits (ED), inpatient days hospitalized (IP), total allowed medical cost, and total allowed pharmacy cost (per-member per-year, PMPY) were compared between mild vs. moderate-severe periods. Costs were normalized to 2018 US$ per the medical component of the Consumer Price Index.
- Claims for OA-related procedures, encounters or medications were re-analyzed as a subset.

Results

We identified 127,656 patients of whom 18% progressed from mild to moderate-severe and 31% were moderate-severe at initial diagnosis.

- Moderate-severe OA patients had higher rates of OP visits and IP days than mild OA patients (OP: 9.8 vs. 8.7; IP: 12.2 vs. 4.3) and higher total pharmacy cost ($6212 vs. $4817 PMPY) (Tables 1 and 2).
- All categories of OA-related utilization and costs were significantly higher for moderate-severe vs. mild (OP: 0.96 vs. 0.42, IP: 1.02 vs. 0.04, ED: 0.19 vs. 0.13, pharmacy: $613 vs. $437, medical: $1631 vs. $411) (Tables 1 and 2).
- All significant findings were p<0.001.

Conclusion

Treatment-based severity level was strongly associated with patients' OA-related utilization and costs, and, in most cases, all-cause utilization and costs. Understanding patients' disease progression is important for better managing and treating disease burden in the future.

Acknowledgments

This study was sponsored by Pfizer and Eli Lilly and Company.

Disclosures

JG, TN, HS, BP, JAB, MK, VD and EW are employees of Geisinger which received financial support from Pfizer and Eli Lilly and Company in connection with the development of this poster.

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Table 1: Utilization events per member per year (PMPY), stratified by OA treatment-based severity.
Boxes with orange shading indicate increases in utilization for the moderate-severe category as compared to mild (SD = Standard Deviation).

	Mild (N=83,625)		Moderate-Severe (N=63,615)	
All-Cause	**N (%) with any**	**Mean (SD)**	**N (%) with any**	**Mean (SD)**
Outpatient visits	78,031 (93%)	8.7 (11.0)	61,521 (97%)	9.8 (9.1)
Home health visits	23,588 (28%)	1.1 (4.1)	33,467 (53%)	1.5 (3.8)
Skilled nursing facility admits	3,589 (4%)	0.10 (1.1)	9,689 (15%)	0.24 (1.37)
ED visits	42,543 (51%)	0.96 (2.3)	41,395 (65%)	0.96 (2.2)
Hospitalizations	23,119 (28%)	0.29 (0.98)	29,214 (46%)	0.33 (0.82)
Length of Stay (days)	--	4.3 (14.9)	--	12.2 (31.4)
OA-Related				
Outpatient visits	29,826 (36%)	0.42 (1.3)	43,966 (69%)	0.96 (1.7)
Home health visits	1,078 (1%)	0.02 (0.34)	8,140 (13%)	0.08 (0.51)
Skilled nursing facility admits	253 (<1%)	0.01 (0.33)	2,383 (4%)	0.02 (0.22)
ED visits	14,709 (18%)	0.13 (0.57)	21,264 (33%)	0.19 (0.64)
Hospitalizations	639 (1%)	0.01 (0.21)	9,033 (14%)	0.05 (0.28)
Inpatient days	--	0.04 (0.68)	--	1.02 (4.04)

Table 2: Costs ($) per member per year (PMPY), stratified by OA treatment-based severity.
Boxes with orange shading indicate increases in mean costs, and blue boxes indicate decreases in mean costs, for the moderate-severe category when compared to mild (CI = Confidence Interval, IQR = Interquartile Range).

	Mild (N=83,625)	Moderate-Severe (N=63,615)
All-Cause	**Mean (95% CI half-width) Median (IQR)**	**Mean (95% CI half-width) Median (IQR)**
Total Cost (Medical + Pharmacy)	20,348 (304) 7,467 (2864, 18802)	19,968 (251) 11,236 (5106, 22684)
Pharmacy	4,817 (141) 906 (92, 3745)	6,212 (140) 1,960 (384, 5795)
Medical	15,531 (255) 4,742 (1695, 12932)	13,755 (195) 7,110 (2885, 15318)
Inpatient	4,906 (154) 0 (0, 1192)	5,239 (128) 0 (0, 4970)
Outpatient	7,171 (155) 1,863 (555, 5120)	5,017 (92) 2,398 (981, 5082)
ED Visits	785 (22) 14 (0, 584)	818 (23) 200 (0, 788)
OA-Related		
Total Cost (Medical + Pharmacy)	849 (31) 118 (19, 513)	2,244 (51) 626 (175, 2213)
Pharmacy	437 (11) 22 (0, 171)	613 (18) 58 (4, 394)
Medical	411 (28) 21 (0, 152)	1,631 (47) 287 (67, 1143)
Inpatient	108 (21) 0 (0, 0)	872 (46) 0 (0, 0)
Outpatient	157 (11) 0 (0, 36)	386 (21) 60 (0, 252)
ED Visits	22 (3) 0 (0, 0)	31 (2) 0 (0, 7)