Comparison of Healthcare Utilization and Costs in the Year Prior to Reverse Shoulder Arthroplasty for Glenohumeral Osteoarthritis Among Patients With and Without Depressive Disorder.

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INTRODUCTION: A majority of cost-control strategies in reverse shoulder arthroplasty (RSA) have been concentrated on the perioperative and post-acute care periods, with the preoperative health care period being largely understudied. Several investigations have evaluated the association of mental health disorders on costs following RSA. The aims of this study were to report the distribution of costs associated with health care utilization within the year prior to reverse shoulder arthroplasty among patients with and without depression.

METHODS: A nationwide database was queried from 2010 to 2020 for primary RSA for glenohumeral osteoarthritis. Patients with a preoperative diagnosis of depression (n = 4,084), were compared to a control cohort (n = 20,242) after 1:5 ratio matching by age, sex, and comorbid conditions – anxiety, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), diabetes mellitus, hyperlipidemia, hypertension, tobacco use, and obesity. Preoperative expenditures between patients who had and did not have depression were compared in the year prior to RSA. The following categories were compared and reported on a per claim basis: office visits, shoulder radiographs, computed tomography (CT) scans, magnetic resonance imaging (MRI) scans, steroid injections, hyaluronic acid (HA) injections, physical therapy, and pain medications (opioid prescriptions). A sub-analysis compared Medicare Beneficiaries to Commercial Insurance plans to control for differences in reimbursements. All reimbursements were adjusted for inflation to 2020 U.S. Dollars (USD). Expenditures were actual reimbursements made by the insurance company to the provider. Costs were compared using T-tests with significant thresholds of $p<0.05$.

RESULTS:

Mean total 1-year preoperative costs (in USD) were not significantly different between patients who had a history of depression ($3612/patient) versus those without depression ($3219/patient) ($p=0.733$). The largest proportion of costs in the year prior to RSA for both groups was accounted for by steroid injections (Depression: $913 (25%) and controls: $750 (23%)), followed by CT scans (Depression: $772 (21%) and controls: $690 (21%)), and MRI scans (Depression: $596 (17%) and controls: $599 (19%)). The remaining healthcare utilization parameters were also compared and not significantly different. Controlling for insurance carrier, albeit slightly higher for CT scans, PT visits, and steroid injections, these did not reach statistical significance in Medicare beneficiaries ($p>0.0786$). Similarly, for privately insured patients, reimbursements were higher for CT scans, PT visits, steroid injections, and HA injections although these did not reach statistical significance ($p=0.428$). Depression patients incurred significantly higher episode of care costs within the 90-day episode of care interval postoperatively ($19,363.10 vs. $17,927.55, $p<0.0001$).

DISCUSSION AND CONCLUSION: Approximately $3,000 per patient was spent in healthcare resource use in the year prior to undergoing RSA for glenohumeral osteoarthritis. Despite increased 90-day episode of care costs postoperatively, the preoperative expenditures did not appear to differ among patients with and without DD. As we begin to implement value in shoulder surgery, judicious use of nonoperative treatment modalities among patients who would not benefit from nonoperative care will be an effective way of reducing costs.

	Depressive Disorder		Comparison Cohort		
Demographics	n	%	n	%	*p*-value
Age (Years)					0.99
35 to 39	*	N/A	*	N/A	
40 to 44	*	N/A	*	N/A	
45 to 49	26	0.64	113	0.56	
50 to 54	86	2.11	415	2.05	
55 to 59	243	5.95	1,186	5.86	
60 to 64	498	12.19	2,460	12.15	
65 to 69	783	19.17	3,880	19.17	
70 to 74	1,285	31.46	6,386	31.55	
75 to 79	1,039	25.44	5,199	25.68	
80<	117	2.86	575	2.84	
Sex					0.98
Female	2,149	52.62	10,655	52.64	
Male	1,935	47.38	9,587	47.36	
Comorbidities					
CHF	503	12.32	2,433	12.02	0.98
COPD	1,546	37.86	7,606	37.58	0.99
Diabetes Mellitus	1,893	46.35	9,403	46.45	0.99
Hyperlipidemia	920	22.53	4,535	22.40	0.97
Hypertension	3,731	91.36	18,550	91.64	0.99
Obesity	1,779	43.56	8,834	43.64	0.95
Tobacco Use	1,112	27.23	5,476	27.05	0.96

Table 1. Baseline Demographics of Patients with Depressive Disorder and Comparison Cohort Undergoing Primary Reverse Shoulder Arthroplasty for the Treatment of Glenohumeral Osteoarthritis. CHF = Congestive Heart Failure; COPD = Chronic Obstructive Pulmonary Disease; * = <11 Patients; N/A = non-applicable