Home Health Care is Associated with an Increased Risk of Emergency Department Visit, Readmission, and Cost of Care without Reducing Risk of Complication following Lumbar Fusion: A Propensity-Score Analysis

Mark D Wieland, Sean Sequeira, Mesfin A Lemma[1]
[1]Medstar Orthopaedics

INTRODUCTION:

Home health services have long been implemented for patients to receive additional professional care and supervision following discharge from the hospital to theoretically reduce the risk of complication and healthcare utilization. The aim of this investigation was to determine if patients assigned home health services exhibited lower rates of medical and surgical complications, healthcare utilization and cost of care following lumbar fusion (LF).

METHODS:

A national insurance database was retrospectively reviewed to identify all primary LF patients from 2010 to 2019. Patients who received home health services were matched using a propensity score algorithm to a set of similar patients who were discharged home under self-care. We compared medical and surgical complication rates, emergency room visits, readmissions, and 90-day cost of care between the groups. Multivariate regression analysis was performed to determine the independent effect of home health services on all outcomes.

RESULTS:

A total of 5,380 patients received home health services and were matched to 53,800 patients who were discharged home under self-care. Patients who received home health services had higher rates of ED visits at 90 days (OR 1.491; $P < 0.001$) as well as increased readmissions at 90 days (OR 1.67; $P < 0.001$). Patients who received home healthcare services had higher rates of deep vein thrombosis (OR 1.95; p<0.001), transfusion (OR 1.67; p < 0.001), pneumonia (OR 1.33; p = 0.036), stroke (OR 1.54; p = 0.022), and urinary tract infection (OR 1.16; p = 0.018). Episode-of-care costs for home health patients were higher than those discharged under self-care ($14,236.97 vs. $12,817.12; $P <$ .001).

DISCUSSION AND CONCLUSION:

Patients assigned home healthcare services exhibited higher cost of care without decreased risk of complication and had increased risk of early return to the ED and readmission. These findings are important for surgeons and inpatient therapists to consider when internally evaluating the structure of home healthcare services and determining which postoperative patients are candidates for these services.

Table 1. Patient Demographics and Comorbidities Prior to Propensity-Score Matching

		Lumbar Fusion		
		Home Health	Self-Care	P-value
Age	50-59	19.2	12.5	0.094
	60-64	23.1	15.4	0.011
	65-69	22.7	30.3	0.034
	70-74	15.7	25.4	0.023
	>75	3.4	6.0	0.049
Male		45.3	44.2	0.341
Obesity		72.5	48.3	0.026
ETOH		5.4	5.9	0.407
Chronic Kidney Disease		16.4	12.5	0.278
Chronic Pulmonary Disease		28.0	29.6	0.555
Coronary Artery Disease		47.0	31.5	0.006
Depression		37.2	33.9	0.535
Diabetes Melittus		67.3	40.3	<0.001
HTN		91.4	76.3	0.008
PVD		36.8	22.5	<0.001

Table 3. 90-Day Medical Complications Following PLF in Home Health and Self-Care cohorts

Complication	Home health		Self-care		Statistical Analysis		
	N	%	N	%	OR	95% CI	P
PE	33	0.613	313	0.581	1.0546	0.7359 to 1.5114	0.772
DVT	44	0.817	227	0.421	1.9461	1.4074 to 2.6909	< 0.0001
transfusion	88	1.635	530	0.985	1.6714	1.3314 to 2.0981	< 0.0001
pneumonia	63	1.171	476	0.884	1.3274	1.0191 to 1.7289	0.0357
stroke	33	0.613	215	0.399	1.5382	1.0651 to 2.2214	0.0217
MI	18	0.334	116	0.215	1.5536	0.9448 to 2.5546	0.0825
sepsis	54	1.003	421	0.782	1.2855	0.9670 to 1.7089	0.0838
acute anemia	46	0.855	389	0.723	1.1841	0.8712 to 1.6094	0.2805
ARF	131	2.434	1135	2.109	1.158	0.9643 to 1.3907	0.1162
UTI	303	5.631	2634	4.895	1.1593	1.0258 to 1.3102	0.0179

Table 4. 90-Day Hospital Utilization Following LF in Home Health and Self-Care cohorts

Complication	Home health		Self-care		Statistical Analysis		
	N	%	N	%	OR	95% CI	P
Readmission	641	11.914	4031	7.492	1.67	1.5285 to 1.8246	< 0.001
ED visit	1130	21.003	8142	15.134	1.491	1.3906 to 1.5986	< 0.001
Cost of care	$14152.97 ± $19320.21	---	$13167.62 ± $17070.41	---	---	---	<0.001