



The Impact Of Depression And Opioid-antidepressant-anxiolytic Use On Length Of Stay And Hospital Cost Of Spine Surgery

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Abstract

Background: The purpose of this study is to investigate the economic impact of opioid-antidepressant-anxiolytic use in spine surgery patients.

Methods: The charts of 816 spine surgery inpatients of the Medical Center of Central Georgia were retrospectively reviewed and data on preoperative use of opioids, antidepressants and anxiolytics as well as history of depression were collected and analyzed for any impact on length of stay and hospital charges. Surgery was either lumbar microdiscectomy (LMD), anterior cervical decompression and fusion (ACDF), or lumbar decompression and fusion (LDF).

Results: LDF patients with history of depression had higher prevalence of combined opioid, antidepressant and anxiolytic use compared with the rest of the patients (20%). However, graphing opioid-antidepressant-anxiolytic use in each type of spine surgery against the average length of stay and hospital charges showed an increase in stay and charges in the LDF group without a history of depression (or possibly undiagnosed depression).

Conclusion: LDF patients without history of depression who are on all three medications (opioids, antidepressants and anxiolytics) are more likely to stay longer in hospital and seem to consume more hospital resources than others.

Introduction

Chronic back pain is a major health problem and the number of surgical interventions on the spine has increased multiple folds in the United States compared with other developed countries (1). Back pain is associated with high health-care expenditure and lost productivity related to absenteeism resulting in lost wages averaging \$2884 per patient during the first postoperative year (2). The total costs related to back pain in the United States exceed \$100 billion per year. Beside cost, back pain and spine surgery patients are a source of concern for issues of painkiller abuse (3, 4). Nearly half of lumbar disc herniation or spinal

stenosis patients report opioid use at baseline and a fifth report use at two years (5, 6). Moreover, depression is common in back pain and spine surgery patients which has been shown to play a role as a predictor of poor outcome (7).

Given the significant emphasis currently held on the cost of health care, this study examines the relationship of spine surgery cost with depression and opioid-antidepressant-anxiolytic use and investigates the economic impact of possible overprescription of psychotropic medications in spine surgery patients.

Methods

The charts of 816 spine surgery inpatients of the Medical Center of Central Georgia operated between 2005 and 2008 were retrospectively reviewed. The cohort included lumbar microdiscectomy (LMD), anterior decompression and fusion (ACDF) and lumbar decompression and fusion patients (LDF). Data on preoperative use of opioids, antidepressants, anxiolytics as well as history of depression were collected. The interaction of these variables with length of stay and hospital charges was studied using the Chi-square test and multivariate analysis with the help of SPSS v16.

Results

Analysis of our patient cohort showed that patients with history of depression had higher prevalence of antidepressant and multitype use compared with patients denying history of depression (Table 1). The highest use of antidepressant alone (38%) was in the ACDF group. The highest uses of opioid-anxiolytic (10%) and opioid-antidepressant (44%) were in the LMD group. The highest use of all three types of medication alone was in the LDF group (20%).

Graphing opioid-antidepressant-anxiolytic use in each type of spine surgery against the average length of stay and hospital charges showed an increase in stay and charges in the LDF group (Figure 1). There seemed to exist two cost spikes correspondent to anxiolytic and opioid-anxiolytic use in ACDF patients.

Multivariate analysis showed a significant impact of triple regime ($P=.01$) on hospital charges. The effect of opioid-antidepressant-anxiolytic use on length of stay and hospital charges was more prominent in LDF patients without history of depression. Length of stay increased from 5 days at baseline to 12 days with triple regime. Parallel to that, hospital charges increased from \$55,473 to \$86,612 (Figure 2). The previously mentioned spikes correspondent to axiolytic and opioid-anxiolytic use in ACDF patients were more accentuated in patients with history of depression. Cost of ACDF increased from \$25,466 at baseline to \$67,790 with axiolytic use and \$40,573 with opioid-anxiolytic use.

Discussion

Depression is a common co-morbidity in patients with spine disorders, yet often goes undiagnosed by rheumatologists, pain specialists, and neurosurgeons (8). In our study, history of depression by itself did not appear to affect length of stay and hospital charges in spine patients except for ACDF on axiolytic or opioid-anxiolytic and LDF patients on opioid-anxiolytic. In the group without history of depression, LDF patients who were taking all three medications stayed significantly longer and had higher hospital charges. This expands on a previous study that showed that antidepressant use (depressed and undepressed combined) was associated with an increase in hospital charges related to LDF procedures (9). The study also supports our previous results showing no association between opioid dependence and length of stay (6). The difference between the two studies is between opioid dependence (previous) and opioid use (current). Opioid use alone in spine surgery candidates did not seem to be associated with a significant increase in length of stay or hospital charges.

Antidepressants have been increasingly prescribed in the last two decades for back pain problems (10). The higher percentage of simultaneous antidepressant and axiolytic use in spine surgery candidates with a history of depression reveals the affective component in back pain physiology. From our study, opioid-antidepressant-anxiolytic use in LDF candidates without history of depression (or possibly undiagnosed depression) might have an additional or perhaps synergistic effect on cost parameters. We encourage better involvement of psychologists, psychiatrists, behavioral therapists and social workers with these patients which may help increase treatment efficiency and decrease the risk of failed back syndrome.

References

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Illustrations

Illustration 1

Table 1

Table 1: The division of the patient cohort by type of surgery, history of depression and opioid-antidepressant-anxiolytic use.

Depression	LMD				ACDF				LDF			
	No		Yes		No		Yes		No		Yes	
	N	N %	N	N %	N	N %	N	N %	N	N %	N	N %
None	89	49%	2	3%	143	61%	12	11%	69	44%	4	6%
Anxiolytic	3	2%	1	1%	5	2%	1	1%	4	3%	0	0%
Opioid	73	40%	5	7%	77	33%	8	8%	64	41%	5	7%
Opioid +Anxiolytic	8	4%	7	10%	3	1%	3	3%	6	4%	5	7%
Antidepressant	4	2%	15	22%	2	1%	40	38%	4	3%	23	33%
Antidepressant +Anxiolytic	0	0%	2	3%	0	0%	4	4%	1	1%	6	9%
Antidepressant +Opioid	5	3%	30	44%	3	1%	28	27%	6	4%	13	19%
Antidepressant +Opioid +Anxiolytic	1	1%	6	9%	1	0%	9	9%	2	1%	14	20%

Illustration 2

Figure 1

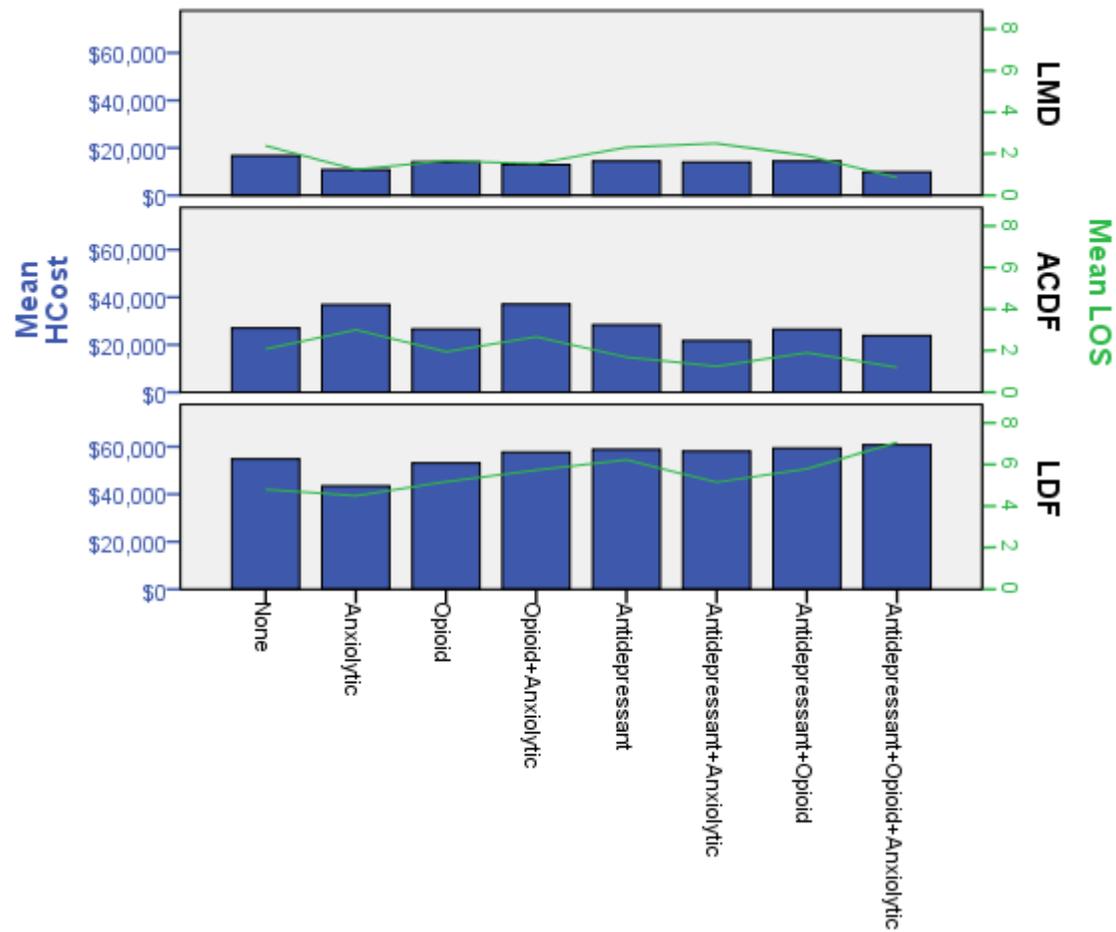


Illustration 3

Figure 2

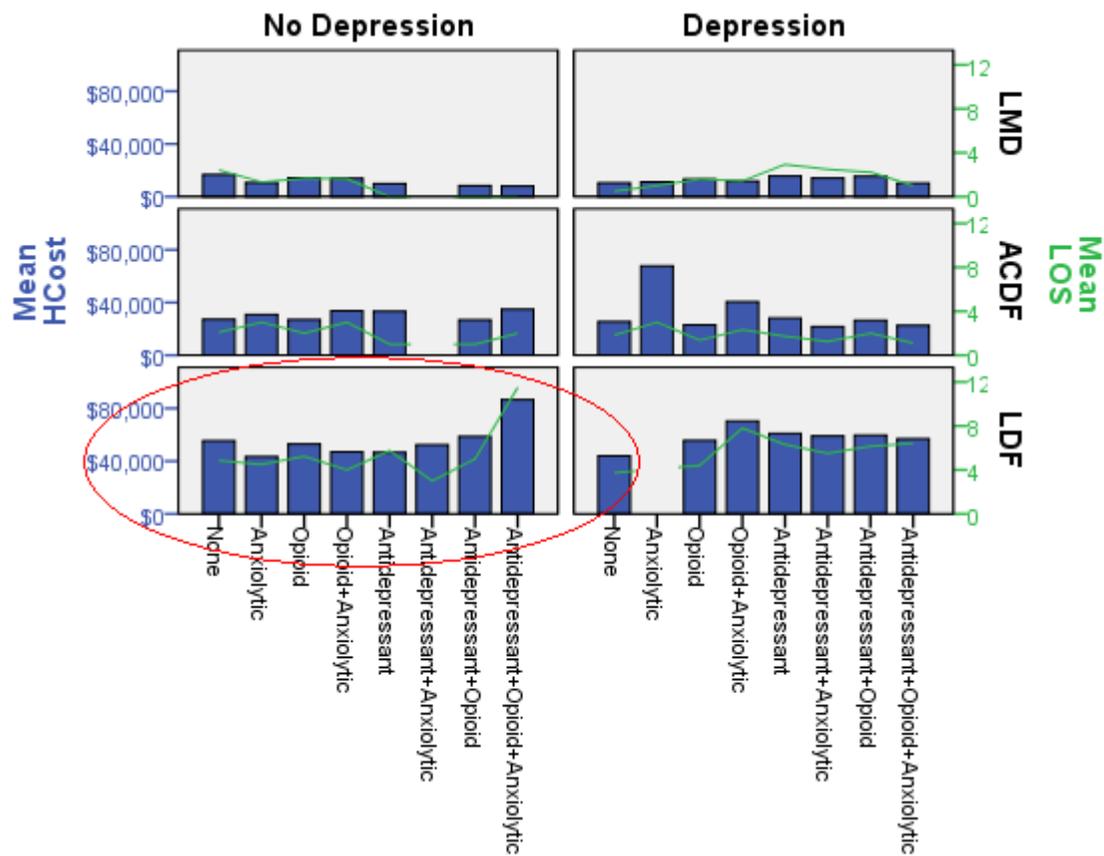


Figure 2: The length of stay and hospital charges by type of surgery, history of depression and

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