



The Impact of Diabetes and Chronic Renal Failure upon Quality of Life Outcomes after Lumbar Decompression

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Introduction

Background Context: Patients with comorbid disease may experience suboptimal quality of life (QOL) improvement following decompression spinal surgery. Prior studies have suggested the deleterious effect of diabetes upon postoperative QOL; however, these studies have not utilized minimum clinically important differences (MCID) or multivariable statistical techniques.

Purpose: The purpose of this study was to assess the effect of preoperative diabetes upon postoperative improvement in QOL.

Methods

Study Design/Setting: Retrospective cohort study at a single tertiary-care center.

Outcomes Measures: Postoperative improvement in the EuroQol 5-Dimensions (EQ-5D), Pain Disability Questionnaire (PDQ), and Patient Health Questionnaire 9 (PHQ-9) at last follow-up. The secondary outcome variable was postoperative improvement in QOL measures exceeding the MCID.

Methods: QOL data were collected using the institutional prospectively-collected database of patient-reported health status measures. Simple and multivariable logistic regressions were used to assess the impact of diabetes upon normalized improvement in QOL and improvement exceeding the MCID.

Results

There were 212 patients who met inclusion criteria. While non-diabetics experienced significant improvements in EQ-5D, PDQ, and PHQ-9 ($p < 0.01$), diabetics experienced no significant improvements in any measures. More non-diabetics achieved the EQ-5D MCID compared with diabetics (55% v. 23%, $p < 0.01$). Race, surgical indication, chronic kidney disease (CKD), and diabetes were independent predictors of postoperative EQ-5D improvement. Caucasian relative to black race ($\beta = 0.10$, $p = 0.04$) and disc herniation relative to spinal stenosis ($\beta < 0.01$, $p = 0.03$) correlated with improvement in EQ-5D. In contrast, CKD ($\beta = -0.30$, $p = 0.03$) and diabetes ($\beta = -0.11$, $p = 0.03$) were associated with diminished improvement in EQ-5D.

Race and diabetes were also found to be independent predictors the EQ-5D MCID. Caucasian relative to black race (OR 3.23, $p = 0.03$) correlated with favorable EQ-5D improvement, while diabetes (OR 0.19, $p < 0.01$) predicted diminished improvement in EQ-5D. CKD trended toward predicting diminished improvement (OR < 0.01 , $p = 0.08$).

EQ-5D Regression Analysis				
Variable	Simple Regression		Multivariable Regression	
	β Coefficient	p -value	β Coefficient	p -value
Age	< 0.01	0.72		
Race*	0.12	0.01	0.10	0.04
Male	0.04	0.18	-0.01	0.78
Income	< 0.01	0.08	< 0.01	0.24
BMI	< 0.01	0.66		
Marital Status**	0.06	0.88		
Procedure Type***	0.08	0.66		
Diagnostic Indication****	< 0.01	0.09	< 0.01	0.03
Chronic Kidney Disease	-0.19	0.11	-0.30	0.03
Diabetes	-0.10	0.02	-0.11	0.03
Coronary Artery Disease	-0.08	0.17	-0.05	0.47
Hypertension	-0.05	0.08	-0.02	0.56
Stroke History	0.22	0.28		
EQ-5D Index Baseline	-0.64	< 0.01	-0.78	< 0.01

Conclusions

The QOL benefit of decompression surgery for degenerative lumbar disease is well described in the literature. However, this patient population is commonly burdened with comorbid disease. In the present investigation, diabetes and CKD were found to be significant and independent predictors of suboptimal QOL benefit after lumbar decompression. These findings emphasize the necessity for appropriate patient selection, consent, and medical optimization prior to surgery. Continued efforts should be made to investigate and mitigate the mechanisms of these deleterious effects, with particular emphasis on perioperative management and wound healing.

Learning Objectives

- By the conclusion of this session, participants should be able to:
- 1) Describe the importance of comorbid disease in identifying patients with the greatest expected quality of life (QOL) benefit after decompressive spine surgery.
 - 2) Discuss, in small groups, the underlying mechanisms for suboptimal quality of life benefit in diabetes and chronic renal failure.
 - 3) Identify an effective preoperative management protocol for patients with these comorbid diseases in an effort to maximize quality of life benefit from decompressive spine surgery.

References

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