

Preoperative narcotic use is associated with worse post-operative self-reported outcomes in patients undergoing spine surgery

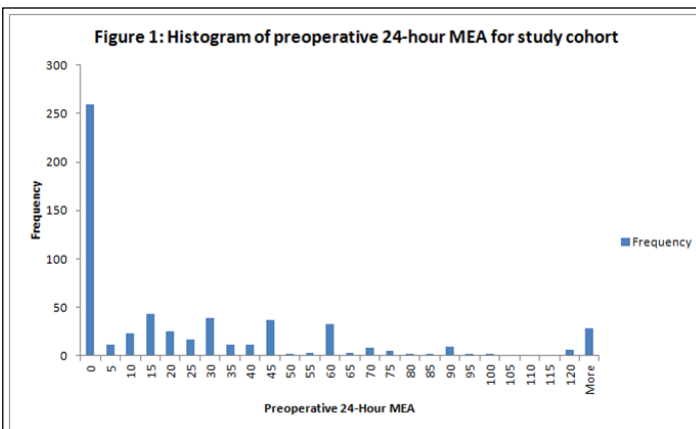
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Introduction

Recent national attention has highlighted the negative effects of narcotics in spine surgery and other non-malignant pain settings. Despite this observation, there is a paucity of data on the effect of narcotic consumption and patient reported outcomes in patients undergoing spinal surgery.

Learning Objectives

This abstract demonstrates the negative impact that preoperative narcotic consumption has on patient reported outcomes, specifically SF-12, EQ-5D, and ODI/NDI score.



Conclusions

Our work suggests that increased preoperative narcotic consumption prior to undergoing spinal surgery for a structural lesion is associated with worse patient reported outcomes.

Results

Univariate analysis revealed that SF-12 scores were significantly improved at both 3 and 12-month follow-up (39.6 ± 11.4 at 3 months, 39.0 ± 13.2 at 12 months, compared to 29.2 ± 9.6 preoperatively, $p < 0.001$), as were EQ5D scores (0.75 ± 0.22 at 3 months, 0.73 ± 0.22 at 12 months, compared to 0.54 ± 0.21 preoperatively, $p < 0.001$). ODI/NDI scores were significantly improved at both follow-up visits (28.7 ± 19.6 at 3 months, 28.4 ± 20.9 at 12 months, compared to 49.2 ± 18.0 preoperatively, $p < 0.001$). Longitudinal multivariable analysis controlling for age, sex, diabetes, smoking, anatomic location, preoperative Modified Somatic Perception Questionnaire (MSPQ) score, preoperative depression, primary vs. revision surgery, and baseline scores revealed that preoperative narcotic use was significantly associated with worse post-operative SF-12, EQ5D, and ODI/NDI scores. Specifically, every 1mg MEA taken preoperatively was associated with a 0.022 decrease in the SF-12 score, a 0.00066 decrease in the EQ5D score, and a 0.048 increase in the ODI/NDI score ($p < 0.001$).

Table 1: Baseline demographic and clinical characteristics of study population (N = 583)

Characteristic	Total N (%)
Mean Age (SD)	57.0 (13.2)
Sex	
Female	317 (54%)
Male	266 (46%)
Race	
White	512 (88%)
Non-White	71 (12%)
Insurance	
Public	291 (50%)
Private	292 (50%)
Smoking History	
Never	273 (48%)
Current	155 (26%)
Former	155 (26%)
Diabetes	
No	456 (78%)
Yes	127 (22%)
BMI Category	
Normal	104 (18%)
Overweight	251 (43%)
Obese	228 (39%)
Opioid Use	
Current	321 (55%)
Never	262 (45%)
Median MEA (IQR)	8.75 (0-37.5)
Intraoperative MEA/hr (SD)	42.21 (64.9)
Postoperative MEA/hr (SD)	12.77 (14.46)
Mean ZDS Score (SD)	37.9 (9.8)
Mean MSPQ Score (SD)	7.6 (5.1)
Primary vs. Revision Surgery	
Primary	381 (65%)
Revision	202 (35%)
Surgery Invasiveness	
Lumbar Microdiscectomy	59 (10%)
Lumbar Laminectomy/Anterior Cervical	187 (32%)
Lumbar Fusion/Posterior Cervical	264 (45%)
Deformity/Anterior+Posterior Cervical/Cancer/Infection	73 (13%)

Methods

583 patients undergoing lumbar (60%), thoracolumbar (11%), or cervical spine (29%) surgery for a structural lesion were included. Preoperative narcotic consumption was gathered from the medical record and converted to the corresponding daily morphine equivalent amount. Preoperative baseline, 3-month post-operative, and 12-month post-operative SF-12, ODI/NDI, and EQ5D scores were assessed. ODI and NDI scores were combined into a single outcome variable to include both cervical and lumbar patients in simultaneous analysis. Multivariate regression analysis was used to assess the association between preoperative narcotic use and post-operative SF-12, EQ5D, and ODI/NDI scores.

Table 1: Multivariable linear regression models of SF-12 PCS and MCS scores at 3 and 12 months postoperatively

Variable	PCS Score		MCS Score	
	3-month β (95% CI)	12-month β (95% CI)	3 Month β (95% CI)	12 Month β (95% CI)
Baseline SF-12 Score	0.25 (0.14-0.35)*	0.29 (0.18-0.40)*	0.22 (0.13-0.31)*	0.21 (0.12-0.31)*
Preoperative Narcotic Use	-0.03 (-0.05 - -0.01)*	-0.03 (-0.05 - -0.01)*	-0.03 (-0.05 - -0.01)*	-0.03 (-0.05 - -0.01)*
Revision Surgery	0.16 (-1.72-2.05)	0.20 (-1.88-2.29)	-0.21 (-1.86-1.44)	0.01 (-1.90-1.91)
Surgery Invasiveness				
Level 1 vs. Level 0 (ref)	-0.68 (-3.39-2.02)	-1.30 (-4.43-1.83)	1.71 (-1.07-4.49)	-0.16 (-3.00-2.67)
Level 2 vs. Level 0 (ref)	-1.42 (-4.09-1.25)	-1.45 (-4.58-1.68)	0.68 (-2.06-3.41)	-0.84 (-3.75-2.07)
Level 3 vs. Level 0 (ref)	-0.68 (-4.14-2.77)	-1.45 (-5.22-2.32)	1.00 (-2.14-4.15)	2.15 (-1.43-5.74)
Age in Years	-0.14 (-0.21 - -0.07)*	-0.14 (-0.21 - -0.07)*	0.01 (-0.04-0.07)	0.01 (-0.05-0.08)
Male vs. Female (ref)	-0.79 (-2.50-0.92)	0.20 (-1.72-2.13)	0.12 (-1.46-1.69)	-0.38 (-2.14-1.38)
Diabetes	-0.97 (-3.05-1.10)	-1.74 (-3.98-0.50)	1.01 (-0.84-2.86)	-1.09 (-3.21-1.04)
Current Smoker	-1.96 (-3.94-0.01)	-0.43 (-2.76-1.89)	-1.12 (-3.07-0.82)	-1.86 (-3.92-0.20)
Preoperative MSPQ Score	-0.45 (-0.65 - -0.25)*	-0.79 (-1.06 - -0.52)*	-0.28 (-0.50 - -0.05)*	-0.29 (-0.54 - -0.05)*
Preoperative ZDS Score	-0.10 (-0.20-0.01)	-0.06 (-0.18-0.07)	-0.10 (-0.23-0.03)	-0.23 (-0.37 - -0.10)*

* p-value < 0.05

R²=0.22

R²=0.25

R²=0.23

R²=0.26

CI: confidence interval; MSPQ: Modified Somatic Perception Questionnaire; ZDS: Zung Depression Scale

PCS: Physical Component Summary; MCS: Mental Component Summary; ref: reference

Table 2: Multivariable linear regression models of ODI/NDI and EQ5D scores at 3 and 12 months postoperatively

Variable	ODI/NDI Scores		EQ5D Scores	
	3 Month β (95% CI)	12 Month β (95% CI)	3 Month β (95% CI)	12 Month β (95% CI)
Baseline ODI/NDI	0.25 (0.16-0.34)*	0.19 (0.09-0.29)*	0.7 (-0.03-0.18)	0.08 (-0.01-0.17)
Preoperative Narcotic Use	0.06 (0.03-0.10)*	0.05 (0.02-0.09)*	-0.001 (-0.001 - -0.000)†	-0.001 (-0.001 - -0.000)†
Revision Surgery	0.45 (-2.57-3.46)	-0.48 (-3.55-2.59)	0.01 (-0.03-0.05)	0.02 (-0.01-0.06)
Surgery Invasiveness				
Level 1 vs. Level 0 (ref)	0.43 (-4.34-5.19)	3.47 (-1.18-8.12)	0.001 (-0.06-0.06)	-0.02 (-0.07-0.03)
Level 2 vs. Level 0 (ref)	0.77 (-3.85-5.40)	3.07 (-1.51-7.65)	-0.02 (-0.08-0.04)	-0.04 (-0.08-0.01)
Level 3 vs. Level 0 (ref)	-0.41 (-6.27-5.46)	0.90 (-4.57-6.38)	-0.01 (-0.08-0.07)	-0.02 (-0.08-0.04)
Age in Years	0.28 (0.18-0.39)	0.23 (0.13-0.33)	-0.001 (-0.002-0.000)	-0.001 (-0.002-0.000)
Male vs. Female (ref)	-1.42 (-4.22-1.39)	-0.47 (-3.30-2.35)	-0.01 (-0.05-0.02)	-0.02 (-0.05-0.01)
Diabetes	2.82 (-0.47-6.10)	4.63 (1.20-8.06)*	0.02 (-0.02-0.05)	-0.03 (-0.07-0.01)
Current Smoker	4.03 (0.84-7.22)*	3.24 (-0.15-6.62)	-0.03 (-0.07-0.01)	-0.03 (-0.07-0.01)
Preoperative MSPQ Score	0.77 (0.42-1.13)*	1.21 (0.80-1.62)*	-0.01 (-0.01-0.00)†	-0.02 (-0.2 - -0.01)†
Preoperative ZDS Score	0.17 (-0.3-0.37)	0.28 (0.08-0.49)*	-0.004 (-0.007 - -0.001)†	-0.004 (-0.01 - -0.00)†

* p-value < 0.001; † p-value < 0.05

R²=0.30

R²=0.33

R²=0.17

R²=0.29

CI: confidence interval; MSPQ: Modified Somatic Perception Questionnaire; ZDS: Zung Depression Scale

ref: reference