

Use of Dexamethasone in the Immediate Postoperative Period is Associated with Increased Risk of Instrumentation and Surgical Site Complications in Diabetic Patients undergoing Lumbar Spinal Fusion

Douglass Camp Johnson¹, Brian Patrick McCormick, Brian Kim, Austin Carroll, Joseph Leigh Ferguson², Bryan W Cunningham³, Paul C McAfee⁴

¹Orthopaedic Surgery, Medstar Georgetown University Hospital, ²Medstar Georgetown University Hospital, ³Med Star Union Memorial Hospital, ⁴Medstar

INTRODUCTION:

Dexamethasone is widely used in postoperative spine patients, and there are few studies investigating the effects in a diabetic population that is more at risk when receiving the medication. This study aims to determine the effects of dexamethasone on postoperative complications.

METHODS:

Patients undergoing 1- or 2-level posterior lumbar fusions with a diagnosis of diabetes mellitus who received dexamethasone within three days postoperatively were identified using a national insurance database. Patients were propensity-matched in a 1:10 ratio to diabetic patients undergoing the same procedure who did not receive dexamethasone. Medical complications including DVT, UTI, AKI, pneumonia, and transfusion were assessed at 90 days. Surgical site and instrumentation complications were assessed at 30 days, 90 days, and 1 year.

RESULTS:

A total of 7,865 patients comprise the basis of this analysis and were included in this study. In total, 715 patients in the test group (female=372, male=343) received dexamethasone postoperatively. A total of 7,150 patients who did not receive dexamethasone were included in the control group. Patients in the test group had a significantly higher risk of DVT at 90 days (OR: 1.9 [1.2-3.0], p= 0.0068). There was no difference in UTI, AKI, pneumonia, or transfusion at 90 days (p>0.05). Surgical site complications were significantly elevated in the test group at 30 days (OR: 1.51 [1.01-2.13], p=0.019), 90 days (OR: 1.38 [1.00-1.91], p=0.047), and 1 year (OR: 1.36 [1.01-1.84], p=0.046). Instrumentation complications were also significantly elevated in the test group at all timepoints: 30 day (OR: 2.0 [1.16-3.43], p=0.012), 90 day (OR: 2.18 [1.45-3.28], p=0.0002), 1 year (OR: 1.63 [1.22-2.19], p=0.001). Length of stay was shorter in the test group, 3.29 days versus 3.48 days respectively (p= 0.0259).

DISCUSSION AND CONCLUSION:

Previous literature has demonstrated that diabetic patients with high glycemic variability have an increased propensity for wound complications, medical complications, and instrumentation complications including pseudarthrosis. The current study demonstrated that diabetic patients treated postoperatively with dexamethasone exhibited significantly higher rates of surgical site complications, instrumentation complications, and deep vein thrombosis. Although dexamethasone has been shown to be successful as an adjunct for pain control after posterior spinal surgery, its known effects on glucose levels and immune response may contribute to poor outcomes in diabetic population. Further prospective research is warranted on the utilization of postoperative steroids in this patient population.

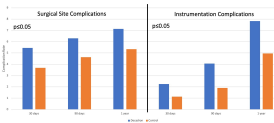


Table 1. Patient Demographics and Comorbidities

	Dexamethasone (n = 715)	Control (n = 7150)	P
Female	372	4048	0.885
Age			
30-39	63	578	
40-49	149	1039	
50-59	245	1712	
60-69	164	1824	
70-79	94	943	
Hypertension	619	6292	0.780
Tobacco Use	182	1777	0.713
Alcohol Use	19	151	0.340
Obesity	185	1741	0.368
Chronic Kidney Disease	38	303	0.179
Chronic Pulmonary Disease	167	1740	0.560
Congestive Heart Failure	33	286	0.485
Coronary Artery Disease	156	1340	0.982
Depression	202	2,013	0.956
Peripheral Vascular Disease	89	800	0.311

Table 2. 90-day Medical Complications

	Dexamethasone (n = 715)	Control (n = 7150)	OR (95% CI)	P
DVT	22	118	1.92 (1.12 - 3.02)	0.007
UTI	30	405	0.729 (0.499 - 1.064)	0.109
AKI	15	126	1.195 (0.586 - 2.022)	0.520
Pneumonia	14	212	0.062 (0.025 - 0.095)	0.784
Transfusion	11	102	1.091 (0.383 - 3.042)	0.761

Table 3. Surgical Complications

	Dexamethasone (n = 715)	Control (n = 7150)	OR (95% CI)	P
Surgical Site Complications				
30 days	39	263	1.512 (1.069 - 2.130)	0.019
90 days	41	311	1.384 (1.000 - 1.908)	0.048
1 year	21	182	1.361 (1.005 - 1.842)	0.046
Instrumentation Complications				
30 days	22	81	2.008 (1.163 - 3.436)	0.012
90 days	29	136	2.181 (1.449 - 3.282)	0.0002
1 year	16	104	1.631 (1.217 - 2.191)	0.001