Incidence, Characteristics, Outcomes and Complications in Uncontrolled Diabetic Patients Undergoing Spinal Deformity Surgery

Branko Skovrlj MD; Javier Zabdi Guzman; John M. Caridi MD; Samuel K Cho
Departments of Neurosurgery and Orthopaedics, Icahn School of Medicine at Mount Sinai, New York, NY

Introduction

DM is a highly prevalent systemic disease that has been shown to increase morbidity and mortality after spine surgery. A few studies have demonstrated negative effects on DM patients who undergo spinal deformity procedures, but whether uncontrolled DM influences surgical outcome is still unknown.

Methods

The Nationwide Inpatient Sample was examined from 2002 to 2011. Patients were included for study based on ICD-9-CM procedural codes for thoracolumbar procedures and further substratified to deformity diagnoses including lordosis (acquired), kyphosis (acquired), scoliosis (idiopathic), thoracogenic scoliosis and other curvatures of the spine (idiopathic/acquired). Patients aged 20 and under were excluded from the study. Uncontrolled DM population was determined by diagnosis codes indicating uncontrolled diabetes regardless of secondary manifestations. Multivariable analysis was done to see if uncontrolled diabetes was an independent risk factor for thoracolumbar fusion revision.

Results

A total of 1,201 patients with uncontrolled DM underwent deformity spine surgery from 2002-2011. Patients with uncontrolled DM were more likely to be older (66.4 vs. 61.1 years for no DM, $p < .0001$) and of male gender (40.8% vs. 30.3%, $p< .0001$). There was a 4 fold increase in the rate of postoperative infection ($p= .0002$), and a nearly 1.7 fold increase in the rate of postoperative hemorrhagic anemia ($p < .0001$). Mean LOS was extended by nearly 3 days (8 days vs. 5.6 days, $p < .0001$) and hospital costs increased by 11.1% ($43,048 for uncontrolled DMvs. $38,743 for no DM, $p < .0001$). Mortality rate was higher in uncontrolled DM, however did not reach statistical significance($p = 0.684$). When controlling for age, race, gender, insurance, and hospital characteristics (e.g. bed size, location, teaching vs. nonteaching), uncontrolled DM was a significant independent factor increasing the odds of thoracolumbar fusion revision (odds ratio=1.6, 95% confidence interval=1.0-2.4, $p = 0.0002$).

Conclusions

Patients undergoing deformity spine procedures with uncontrolled DM had significantly increased cost and LOS. Uncontrolled diabetes increases the odds of thoracolumbar fusion revision in deformity patient, possibly due to advanced degeneration of disc and bone disease.

Learning Objectives

Identify DM as a risk factor for worse outcomes in spinal deformity surgery

References

The Nationwide Inpatient Sample Database 2002-2011