

Prevalence, Complications, and Hospital Charges Associated With Use of Bone-Morphogenetic Proteins in Spinal Fusion Procedures

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Context No national data exist to examine use of bone-morphogenetic proteins (BMPs) in spinal fusion surgery.

Objective To determine the patterns of use and rates of complications and financial charges associated with BMP use in spinal fusion nationally.

Design, Setting, and Patients Retrospective cohort study of 328 468 patients undergoing spinal fusion procedures from 2002-2006 identified from the Nationwide Inpatient Sample database, a 20% sample of US community hospitals.

Main Outcome Measures The rates of use of BMP among patients undergoing spinal fusion procedures are examined along with complications, length of stay, and hospital charges associated with use of this fusion adjunct.

Results The nationwide usage of BMP has increased from 0.69% of all fusions in 2002 to 24.89% of all fusions in 2006. Use of BMP varied by patient sex, race, and primary payer with increased use seen in women (56.26% with BMP vs 53.35% without BMP; odds ratio [OR], 1.12; 95% confidence interval, [CI], 1.09-1.16) and Medicare patients (29.62% with BMP vs 27.16% without BMP; OR, 1.43; 95% CI, 1.31-1.56) and decreased use in nonwhite patients (8.69% with BMP vs 10.23% without BMP; OR, 0.80; 95% CI, 0.75-0.85). When comparing immediate postoperative, in-hospital rates of complications for the year 2006 among patients undergoing spinal fusion by BMP use status, no differences were seen for lumbar, thoracic, or posterior cervical procedures. On univariate analysis and after multivariable adjustment, the use of BMP in anterior cervical fusion procedures was associated with a higher rate of complication occurrence (7.09% with BMP vs 4.68% without BMP; adjusted OR, 1.43; 95% CI, 1.12-1.70) with the primary increases seen in wound-related complications (1.22% with BMP vs 0.65% without BMP; adjusted OR, 1.67; 95% CI, 1.10- 2.53) and dysphagia or hoarseness (4.35% with BMP vs 2.45% without BMP; adjusted OR, 1.63; 95% CI, 1.30-2.05). Bone-morphogenetic protein use was associated with greater inpatient hospital charges across all categories of fusion. Increases between 11% and 41% of total hospital charges were reported, with the greatest percentage increase seen for anterior cervical fusion.

Conclusion Bone-morphogenetic protein was used in approximately 25% of all spinal fusions nationally in 2006, with use associated with more frequent complications for anterior cervical fusions and with greater hospital charges for all categories of fusions.

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