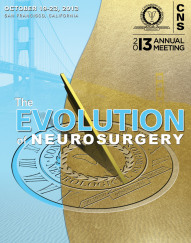


Utility of Hematologic Labs Following Lumbar Fusion

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Introduction

Estimates made from national inpatient databases estimate that approximately 200,000 lumbar fusions are performed annually in the United States alone. Surgeons commonly order hematologic studies to rule out postoperative anemia. However no authors have analyzed the utility of these labs following lumbar fusions.

Methods

A retrospective analysis of all lumbar fusion procedures performed over a 10-year period from 2002-2012 at a single institution by 3 spine surgeons was performed. Inclusion criteria included instrumented and non-instrumented lumbar fusions performed for any etiology with no more than 1 thoracic or 1 sacral level included in the fusion construct. Data was acquired on pre- and post-operative hematologic lab results including the hematocrit, platelet count and INR as well as patient factors such as age, gender, number of levels operated on, indication for surgery, intraoperative blood loss. Multivariate logistic regression was performed to determine correlation to postoperative transfusion requirement or readmission within 1 month of discharge for anemia or transfusion.

Table 1

Results

490 patients undergoing lumbar fusion were identified. Patient characteristics are summarized in Table 1. Indications for operation and types of fusion are summarized in Table 2. Mean number of levels fused was 1.4. Average blood loss per case was 351 cc. There were 5 intraoperative complications, all of which were incidental durotomies that were repaired intraoperatively. There were no cases of intraoperative neural or vascular injury. 25 patients (5.1%) required postoperative transfusion. No patients required readmission for anemia or transfusion. Multivariate logistic regression suggests that reduced preoperative hematocrit, reduced preoperative platelet count and increased intraoperative blood loss are predictive of an increased risk of postoperative transfusion requirement. No correlation was found between postoperative transfusion requirement and number of levels operated on, or indication for operation. There was a step-wise increase in risk of postoperative transfusion as blood loss increased beyond 400 cc (Table 3). Preoperative hematocrit <35 had an OR of 4.3 (p<0.05) of requiring a postoperative transfusion. While there was a statistically significant correlation between decreased preoperative platelet count and increased risk of transfusion requirement, there was not a clinically significant difference in the average preoperative platelet counts of patients who required transfusion (239.5) compared with those patients who did not (265.4).

Table 2

| Indication for Operation | % | Types of Fusion | % |
|--------------------------|-------|-----------------------|------|
| Degenerative | 61.80 | Posterolateral | 73.8 |
| Reoperation | 30.20 | TLIF | 8.2 |
| Trauma | 5.70 | PLIF | 7.7 |
| Tumor | 1.80 | ALIF | 4.1 |
| Infection | 0.40 | Isobar Dynamic Fusion | 4.1 |
| | | Others | 2.1 |

Operative Characteristics

Conclusions

Postoperative anemia requiring transfusion following lumbar fusion is rare. Low preoperative hematocrit and intraoperative blood loss was predictive of increased risk of transfusion requirement. These factors can be used to determine when postoperative hematologic labs may be useful in the management of this patient population.

Learning Objectives

By the conclusion of this session, participants should be able to describe evidence based indications for postoperative hematologic studies following lumbar fusion.

Table 3

| Blood Loss (cc) | Odds Ratio (95% Confidence Interval) | P-value |
|-----------------|--------------------------------------|---------|
| >1000 | 8.872 (1.71-35.35) | 0.013* |
| >750 | 3.73 (1.26-9.54) | 0.019* |
| >500 | 3.29 (1.37-7.57) | 0.009* |
| >400 | 3.28 (1.43-7.55) | 0.006* |
| >300 | 2.15 (0.94-4.99) | 0.07 |

Intraoperative Blood Loss vs. Odds ratio of Postoperative Transfusion requirement