An Evaluation of Warfarin Use and 30-day Hemorrhage in Bariatric Surgery

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An Evaluation of Warfarin Use and 30-day Hemorrhage in Bariatric Surgery
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Background
Lehigh Valley Hospital Health Network (LVHN), a non-profit tertiary care facility in Allentown, Pennsylvania is a Level 1, accredited Bariatric Surgery Center, performing over 375 procedures annually. LVHN is a participant in the American College of Surgeons National Surgical Quality Improvement Program (ACSNSQIP) as of May 2006. The Agency for Healthcare Research and Quality (AHRQ) estimates that 2 million patients are managed on Coumadin or other anticoagulants yearly. As the incidence of obesity in America continues to increase, the number of patients undergoing weight loss procedures is concurrently rising; the number of bariatric surgeries performed increased by 124,000 in 15 years. Patients on chronic anticoagulant therapy who undergo bariatric surgery represent a unique population, as patients often suffer from numerous comorbidities. Within LVHN, at the time of discharge post-bariatric surgery, chronic anticoagulant users are typically returned to their pre-operative anticoagulation regime. Approximately 16%-23% of anticoagulant patients develop hemorrhagic complications within LVHN.

Objective
To evaluate pre- and post-operative INR levels, Coumadin doses, and BMIs of bariatric patients at-risk of hemorrhagic complications due to surgery, and to aid in the future development of Coumadin management guidelines for patients undergoing bariatric surgery.

Methods
INRs and Coumadin doses were collected via telephone and fax correspondences with patients' primary care providers and Coumadin managers (i.e. Cardiologists, Coumadin clinics, HeartCare Group, UPGS).

A retrospective patient chart review was performed on the selected patients within the Lehigh Valley Health Network that were entered into the American College of Surgeons Bariatric Surgery Center Network (ACSBSBSCN) database from 4/1/2008-9/30/2011. Previously collected data by the research team, including readmission information, hemorrhage information, and initial INR levels, was incorporated into the results and discussion of this evaluation.

Results
To proceed with bariatric surgery, surgical protocol states that patients must have an INR of 1.5 or below.

- 22.2% (4/16) of patients did not report a pre-operation INR.
- 90.9% (13/14) of remaining patients were within the optimal range.
- Patient 3 had an INR of 1.9 and is an outlier (Figure 1).

The therapeutic INR range is 2.0 to 3.0.

- At one week post-op, 16.7% (3/18) of patients had no data; 40% (6/15) were within range.
- At 30 days post-op, 56.6% (11/19) of patients had no data; 23.5% (4/17) were within range.
- At 60 days post-op, 16.7% (3/18) of patients had no data; 46.7% (7/15) were within range.
- At 6 months post-op, 5.6% (1/18) of patients had no data; 47.1% (9/19) were within range (Figure 1).

Patients 4, 1, and 15 had the highest BMIs of this population and were the only patients from the included population readmitted to the hospital after bariatric surgery (Figure 2).

Of the total anticoagulated patients, 15.9% were readmitted for hemorrhaging. Of the included patients, 16.7% were readmitted for hemorrhaging (Figure 3).

Conclusions
Patients appear to have a higher incidence of readmission within the first 30 days post-operation and present with elevated INR levels (Table 2).

- No explanation for the trend in coagulopathy can be identified. Potential causes and risk factors are drug interactions, diet modification, biological and physiological adjustment to procedure, BMI, age, and gender. Further study has been initiated to test these concepts and to aid in the identification of causes.
- No observed trend in Coumadin management can be identified (Table 1). Theoretically, low INR levels should be managed with a higher dose of Coumadin, whereas high INR levels should be managed with a lower dose of Coumadin.
- Patients’ Coumadin doses and INR levels should be monitored within 48-72 hours post-discharge.
- Coumadin and INRs should be managed by a single healthcare provider in order to provide the patient with a flawless transfer care between inpatient and outpatient settings. However, this cohort of patients has a positivity to not follow-up.
- Due to the small sample size, this study should be continued in order to increase the patient population to allow for proper statistical analysis.