No Association Between Hospital-Reported Perioperative Venous Thromboembolism Prophylaxis and Outcome Rates in Publicly Reported Data

Venous thromboembolism (VTE), consisting of deep vein thrombosis (DVT) and pulmonary embolism, is an important cause of postoperative mortality and long-term morbidity. Because many events are preventable, VTE prophylaxis performance and postoperative VTE are used as measures of hospital quality of care and patient safety. Two such metrics are reported on the Centers for Medicare & Medicaid Services Hospital Compare website (http://www.medicare.gov/hospitalcompare/search.html) with the stated goal of helping consumers make decisions about where to receive their health care.

The Surgical Care Improvement Project (SCIP) VTE-2, a process measure, captures the percentage of a hospital's surgical patients who received any VTE prophylaxis within 24 hours of surgery. Previous studies have shown that performance on the SCIP VTE-2 measure is not associated with VTE among Medicare patients in 6 high-risk surgical procedures,1 nor with outcomes in a Veterans Affairs cohort.2 In October 2011, Hospital Compare made additional VTE outcomes data available to consumers. We hypothesized that there is no association between the process measure (SCIP VTE-2) and the outcome (Agency for Healthcare Research and Quality Patient Safety Indicator [PSI]-12, a risk-adjusted postoperative VTE rate based on administrative data).

Methods | The SCIP VTE-2 and PSI-12 data were downloaded from the Centers for Medicare & Medicaid Services website. Average annual prophylaxis performance was linked to the 2-year VTE rate for each hospital (from July 1, 2009, to June 30, 2011). The PSI-12 is adjusted for age, sex, age × sex interactions, diagnosis-related group, and modified comorbidity index prior to public reporting. Simple linear regression was used to test for an association between VTE prophylaxis and VTE rate. Sensitivity analyses were performed that excluded outliers and that used a log-transformed VTE rate because the data were not normally distributed. Hospitals were categorized by quintile of prophylaxis performance, and VTE rates were compared using a nonparametric Kruskal-Wallis rank test and Bonferroni-corrected rank sum tests for multiple pairwise comparisons. Hospitals with 100% prophylaxis performance were compared to the lowest quintile using a rank sum test. Statistical analyses were conducted using Stata version 11.2 (StataCorp).

Results | There were 3040 hospitals with complete prophylaxis and VTE data. Average annual prophylaxis performance was negatively skewed (median rate, 94.5%). The median risk-adjusted VTE rate was 4.13 per 1000 surgical discharges. Prophylaxis performance was not associated with VTE rate (P = .13) on linear regression (Figure 1). Regression results were unchanged in sensitivity analyses that excluded outliers (P = .51) and that used a log-transformed VTE rate (P = .90). Among quintiles, the VTE rates appeared to be similar (Figure 2). Although the global Kruskal-Wallis test was significant (P = .04), no pairwise comparison by quintile was statistically significant. Hospitals reporting 100% VTE prophylaxis performance (n = 141) and hospitals in the bottom quintile of prophylaxis performance (n = 618) had nearly identical median VTE outcome rates (4.18 vs 4.17; P = .98, determined by rank sum test).

Discussion | Our findings show that there is no association between reported VTE prophylaxis and outcome rates for surgical patients, when compared across the range of process measure performance. There was no difference in quintiles, or between extremes at 100% performance and the lowest quintile. This may reflect the current low, minimum standard for VTE prophylaxis because the SCIP VTE-2 gives credit for even the most basic, suboptimal prophylaxis. Perhaps a more rigorously applied benchmark to report adherence to optimal, risk-appropriate prophylaxis would have a
greater chance of differentiating hospitals and improving outcomes. Furthermore, VTE rates are greatly influenced by surveillance bias, which likely weakens any association between process and outcome.

To be useful to consumers, hospital quality measures should be associated with important patient outcomes. Biased information, presented as evidence of hospital quality, should not inform the decision-making process. Hospital Compare-reported SCIP VTE-2 prophylaxis rates are of little value to consumers choosing a hospital for surgical treatment. Our results suggest a need to explore alternate public-reporting strategies, such as those that combine process and outcome to identify preventable harm and quantify VTE-related quality of care.

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COMMENT & RESPONSE

Uncertainty in Management of Carotid Stenosis in Women

To the Editor A review of the “management of carotid stenosis in women” has recently been performed by Kuy and collaborators with the aim of defining the burden of carotid disease and providing guidelines for the management of carotid stenosis in women. The anticipated increase in the number of strokes in women underscores the importance of this topic.4 However, the available data on the management of carotid stenosis in women are only partly covered in their review.