

Postop Events: Failure to Rescue Drives Mortality

BY KERRI WACHTER

FORT MYERS, FLA. — The difference between successful and unsuccessful treatment of patients for postsurgical complications may help account for the wide variability in mortality rates following major surgery at hospitals nationwide, according to a retrospective study of data for more than 12,000 patients.

"High-mortality hospitals have mortality rates similar to those of low-mortality hospitals but markedly higher failure-to-rescue rates," Dr. Amir A. Ghaferi said at the annual Academic Surgical Congress.

The failure-to-rescue rate (i.e., mortality following the development of a postsurgical complication) for high-mortality hospitals was more than twice that for low-mortality hospitals—26% versus 11%, respectively. "When we evaluated individual complications, this trend persisted," said Dr. Ghaferi, a surgical resident at the University of Michigan, Ann Arbor.

Wide variability in mortality rates following major surgery has been noted previously. Dr. Ghaferi and his coinvestigators hypothesized that hospitals with higher mortality rates are less effective than low-mortality hospitals in rescuing patients, once they develop complications, and that this could account for some of the variability.

To test their hypothesis, they analyzed data from the American College of Surgeons' National Surgical Quality Improvement Program for all patients undergoing colectomy in 2005-2006. Data were available for 12,688 patients. Primary outcomes included 30-day mortality, the development of one of nine major postoperative complications (pneumonia, unplanned intubation, pulmonary embolism,

myocardial infarction, acute renal failure, postoperative bleeding, deep wound infection, organ-space infection, and fascial dehiscence), and the mortality rates following each of these complications.

In all, 123 hospitals were grouped into quintiles by their risk-adjusted mortality rates. The investigators controlled 27 variables in the risk-adjustment model, including age, sex, race, and American Society of Anesthesiologists physical status classification. Risk-adjusted mortality rates ranged from 1.5% to 7.4% across the groups. Next, they compared complication rates for the nine common postoperative complications across the groups, as well as failure-to-rescue rates (i.e., rates of death caused by any of the nine postoperative complications).

A total of 51% of patients were female, and most (81%) were white, with a mean body mass index of 27 kg/m².

High-mortality hospitals had a 1.5-fold greater risk of postsurgical complications: 16.2% in the high-mortality group, compared with 12.7% in the low-mortality group. "This cannot explain the nearly threefold mortality rate difference across our hospitals. However, when we looked at the failure-to-rescue rate, there's an astonishing difference," he said.

"Many existing policies, which are aimed at reducing the incidence of complications, may not be able to reduce this observed variation in mortality. Rather, we may need to focus on the timely recognition and management of complications once they occur. The next step will be to develop a better understanding of the hospital resources and processes of care that lead to rescue from postsurgical complications."

Dr. Ghaferi reported that he has no relevant financial relationships. ■

Pulmonary HT May Spell Trouble

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Mean patient age was 61 years, 56% were men, and the mean body mass index was 30 kg/m².

A total of 27 patients developed significant perioperative complications. Of those 27 patients, 25 (93%) were in the pulmonary hypertension group, 1 of whom died, Dr. Kaw said at a meeting on perioperative medicine sponsored by the University of Miami.

"We could not look at mortality—we had only one death—so morbidity and mortality were combined," Dr. Kaw said.

Heart failure, sepsis, hemodynamic instability, and respiratory failure were significantly more likely in the pulmonary hypertension group, compared with controls, Dr. Kaw said. Patients with pulmonary hypertension also tended to stay in the ICU longer and were more frequently readmitted to the hospital within 30 days.

In addition to mean pulmonary artery pressure greater than 25 mm Hg (odds ratio 5.9), other significant, independent risk factors included an American Society

of Anesthesiologist class of 2 or greater (OR 4.2) and presence of chronic renal insufficiency (OR 3.2), according to a multivariate regression analysis.

The researchers also looked at the subtype of pulmonary hypertension. The 12 patients with pulmonary arterial hypertension and 46 patients with mixed pulmonary hypertension had a greater risk of complications than did the 38 patients in the study with pulmonary venous hypertension, Dr. Kaw said. The numbers were too small to make significant associations to perioperative complications by subtype, however.

The study's design—a retrospective analysis based on the experience of a single, high-volume institution—was a limitation, Dr. Kaw said. In addition, "we did not have data regarding intraoperative factors, such as use of intraoperative nitrous oxide or vasopressors, blood loss, or type of anesthesia used."

He added that prospective studies are needed. ■

Withholding Some HT Meds May Cut Periop Hypotension

BY DAMIAN McNAMARA

MIAMI BEACH — Patients taking most antihypertensive medications the morning of surgery are not at higher risk for hypotension or more vasopressor use during the perioperative period, according to a retrospective study.

However, significantly more patients taking an angiotensin-converting enzyme inhibitor experienced these events, and there was a higher incidence among those taking an angiotensin-receptor blocker as well.

"We think they should withhold ACE inhibitors and angiotensin-receptor blockers [ARBs]" on the morning of surgery, Dr. Matthieu Touchette said in an interview.

Dr. Touchette and his colleagues compared 371 patients with a diagnosis of hypertension evaluated in the preoperative clinic within the department of medicine at the University of Sherbrooke Central Hospital in Quebec.

All patients had elective surgery and a hospital length of stay longer than 1 day between November 2005 and November 2006. The researchers compared 91 patients who did not take their antihypertensive medication on the morning of surgery with 280 patients who did.

Their aim was to compare hypotensive episodes and use of vasopressors during the perioperative period between these groups. Results were presented in a poster at a meeting on perioperative medicine sponsored by the University of Miami.

Although the guidelines from the American College of Cardiology and the American Heart Association on antihypertensive medications suggest withholding ACE inhibitors and ARBs on the morning of surgery (Circulation 2007;116:e418-99), "we wanted to check if all hypertensive medications make a difference—do they really change" the perioperative course? said Dr. Touchette, an internist at the University of Sherbrooke Central Hospital.

The mean age of the patients was 67 years in the medicine group (43% men) and 69 years in the no-medicine group (54% men). There was more hypertension during preoperative evaluation in the medicine group (91%) than in the no-medicine group (81%). A lower proportion of patients in the medicine group had cardiovascular disease (24% vs. 46%), dyslipidemia (51% vs. 71%), and atrial fibrillation/flutter (7% vs. 21%).

The type of medication that patients were taking at the time of the preoperative clinical evaluation, not surprisingly, corresponded with these diagnoses. For example, more pa-

tients in the medicine group were taking diuretics (56% vs. 43%). In contrast, a higher proportion of patients who did not take hypertensives before surgery were on beta-blockers (54% vs. 23%), calcium channel blockers (48% vs. 25%), and nitroglycerin (9% vs. 2%).

"We found, and it's very interesting, that whether we give pills or not, many people have hypotension during surgery," Dr. Touchette said.

Hypotension, defined as systolic blood pressure less than 90 mm Hg, occurred in 58% of the medicine group and 46% of the no-medicine group. "We were surprised how many of our patients have hypoten-



'ACE inhibitors and ARBs were associated with more hypotensive episodes in the perioperative period.'

DR. TOUCHETTE

sive episodes during surgery. I am an internist—so I am not usually in the OR."

Despite a high incidence of perioperative hypotension, Dr. Touchette and his colleagues found no significant difference between groups. "There was no overall difference if we look at all the medications as one big bag," he said.

They also found no significant difference in perioperative use of vasopressors between those who took their antihypertensive the morning of surgery (71%) and those who did not (79%).

However, "when we looked at individual drugs, the ACE inhibitors and ARBs were associated with more hypotensive episodes in the perioperative period," Dr. Touchette said. Among the patients taking medication on the morning of surgery, there was a statistically significant increased association between perioperative hypotension or vasopressor use if they took an ACE inhibitor (adjusted odds ratio, 2.36), compared with those who did not take this type of medication.

Similarly, patients taking an ARB just before surgery had an increased risk for these two factors, although it was not statistically different (adjusted OR, 2.38).

In contrast, there was a lower risk among patients taking a calcium channel blocker on the morning of surgery (adjusted OR, 0.73), a diuretic (OR, 0.83), or a beta-blocker (OR, 0.89).

Dr. Touchette said that in the future they "would like to try to reproduce the study in a prospective manner." ■