

VTE Risk Persistent

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3.42% by 12 months. Pulmonary embolism accounted for roughly one-third of VTEs at all time points.

Obesity is a known risk factor for VTE. "Bariatric surgery patients will often have three or four risk factors for VTE and are generally considered to be at high risk," he noted.

A multivariate analysis identified additional VTE risk factors beyond obesity. Before VTE emerged as the strongest risk factor for VTE within 6 months of bariatric surgery, it was associated with more than a sevenfold increased risk. The second strongest risk factor was age older than 55 years, conferring a greater than twofold increased risk. Other independent risk factors for VTE were male gender, hospital length of stay in excess of 5 days, smoking, and gastric bypass as opposed to laparoscopic adjustable banding.

VTE occurred by 6 months in 0.8% of the laparoscopic adjustable gastric band group, significantly less than the 2.7% rate in those who underwent laparoscopic gastric bypass and the 3.3% rate following open gastric bypass.

The 6-month VTE rate rose from 1% in patients under 24 years to 2.95% in those aged 35-44 years, 3.1% in 45- to 54-year-olds, and 4.7% in those aged 55 years or more.

Dr. George Eid of the University of Pittsburgh said the rate of VTE occurring later than 1 month post surgery in this study was "alarming," but he wondered whether factors not captured in the administrative database might have contributed to the late cases.

Dr. Magnuson replied that he suspects some of the patients who had VTEs late in the year underwent further surgery, such as body contouring or revisional bariatric procedures. Such information is contained in the billing database, which is still being analyzed.

Dr. Harvey J. Sugerman of Sanibel, Fla., editor in chief of the journal Surgery for Obesity and Related Diseases, commented that the new study raises but cannot answer a number of key questions, including which patients need extended prophylaxis, in what form, and for how long. Answers should be forthcoming from a couple of ongoing prospective major initiatives, including the Bariatric Outcomes Longitudinal Database (BOLD) and the National Institutes of Health-sponsored Longitudinal Assessment of Bariatric Surgery (LABS).

Dr. Magnuson reported having no conflicts of interest in connection with this study. ■

Infection Rate Exceeds 11% After Open Abdominal Aortic Surgery

BY BRUCE JANCIN

DENVER — Open abdominal aortic surgery had an 11.4% rate of in-hospital postoperative infectious complications—the highest incidence for any type of elective vascular surgery—in a large national study.

This national rate will strike many surgeons as being higher than the rates they have experienced, but that's because it includes postoperative urinary tract infections, pneumonia, and sepsis, as well as the surgical site infections surgeons tend to focus on, Dr. Todd R. Vogel said at the Vascular Annual Meeting.

The study underscored the major economic consequences of infectious complications arising after elective vascular surgery. Hospital charges for affected patients were more than three times as great as those of patients without such complications, noted Dr. Vogel of the Robert Wood Johnson Medical School, New Brunswick, N.J.

He presented an analysis of 870,778 elective vascular surgical procedures performed in adults at U.S. hospitals during 2002-2006. The data came from the Nationwide Inpatient Sample of the Agency for Healthcare Research and Quality.

The overall in-hospital postoperative infectious complica-

tion rate was 3.7%. The rate, adjusted for age, gender, race, and comorbid conditions, varied widely by procedure type, with the 1.7% incidence associated with carotid endarterectomy being lowest.

The study showed that the 11.4% infectious complication rate for open abdominal aortic surgery was substantially higher than for aorta-iliac-femoral bypass surgery (8.9%), and the rate for thoracic endovascular aneurysm repair (5.7%) was twice that of endovascular abdominal aneurysm repair (2.8%), Dr. Vogel noted.

Pneumonia, which occurred in 6.6% of patients following open abdominal aortic surgery, was the most common infectious complication associated with that procedure. In contrast, urinary tract infection was the most common infectious complication after thoracic endovascular aneurysm repair and endovascular abdominal aneurysm repair, affecting 2.9% and 1.3% of patients, respectively.

Infectious complications following elective vascular surgery were significantly more common in women than in men, in blacks versus white or Hispanic patients, and in octogenarians versus younger individuals. Rates were higher at urban hospitals, large medical centers,

and—contrary to conventional wisdom—teaching hospitals.

Mean hospital length of stay was 13.8 days in patients with infectious complications and 3.5 days in those without. Hospital charges averaged \$37,834 in those who experienced such complications, compared with \$11,851 in patients who did not.

Several audience members raised the possibility of coding errors in this huge national database, but Dr. Vogel minimized the likely impact of any such mistakes. "If you look globally at the infectious complication rates, you can see there's a problem in terms of race, a problem for women; and there's a problem in terms of the rate for open aortic aneurysm surgery," he said.

Dr. Ronald M. Fairman, an audience member, noted that the Nationwide Inpatient Sample doesn't track readmissions. As a result, a patient undergoing femoral-popliteal bypass or another typically short-stay operation could develop an infectious complication requiring readmission soon after discharge, yet it wouldn't be listed as a postop infectious complication.

"So your figures could actually be an underestimate of the true infection rate," said Dr. Fairman, professor and chief of vascular surgery at the University of Pennsylvania, Philadelphia. ■

‘Surgical Apgar’ Score Can Predict Postop Complications

BY DAMIAN McNAMARA

HOLLYWOOD, FLA. — A 10-point scale based on three intraoperative hemodynamic factors accurately predicts which patients undergoing colorectal resection are likely to experience complications after discharge, according to a study of nearly 800 patients.

The traditional Apgar score is a convenient 10-point scale to assess the status of a newborn shortly after birth. Scores 3 and below are regarded as critically low, 4-6 are fairly low, and 7-10 are normal.

A "surgical Apgar" score can calculate a patient's condition following general or vascular surgery and grade the chances of major complications or death. Among the advantages of using a surgical Apgar score are immediate feedback, no cost, and little effort, Dr. Scott E. Regenbogen said. A patient's score is computed in the operating room using estimated blood loss, lowest mean arterial pressure, and lowest heart rate. (See box.)

"We are looking for opportunities to improve outcomes," Dr. Regenbogen said in an interview at his poster during the annual meeting of the American Society of Colon and Rectal Surgeons.

He and his associates assessed outcomes after 795 colorectal resections over 4 years at Massachusetts General Hospital in Boston. The likelihood of complications after discharge quadrupled among patients with an operating room score between 0 and 4 (relative risk, 4.5), compared with a reference group that had scores of 7 or 8. "So information in the OR still gives us valuable information on how they do even after they leave the hospital," said Dr. Regenbogen, of Massachusetts General Hospital.

The likelihood of complications after discharge also

was higher for patients who scored 5 or 6 (RR, 2.6) but lower for those who scored the highest, a 9 or 10 (RR, 0.6).

There were 49 patients in the 0-4 score group, 186 patients in the 5-6 group, 406 patients in the reference 7-8 group, and 154 in the 9-10 group. The complication rates were 24% for the lowest scoring group, 14% for the 5-6 score group, 5% for the reference group, and 3% among those who scored the highest in the operating room.

The researchers used data from the American College of Surgeons National Surgical Quality Improvement Program database at Massachusetts General Hospital and the institution's Anesthesia Information Management System.

Previous studies validated the score's significant associations with complications in the immediate postoperative period and for other procedures, he said.

For example, a study of 4,119 general and vascular procedures at Mass General and Brigham and Women's Hospital, also in Boston, showed that the score significantly predicts in-hospital postoperative complications (Ann. Surg. 2008;248:320-8). A patient who scored a 7 or 8 in the operating room had no significant change, compared with preoperative risk variables (likelihood ratio, 1.05). In contrast, a score of 0-4 nearly tripled the odds of a major complication within 30 days (LR, 2.80). Again, the best outcomes were associated with a score of 9 or 10 (LR, 0.52).

Dr. Regenbogen had no conflicts of interest to declare. ■

How to Calculate a Surgical Apgar Score

	0 points	1 point	2 points	3 points	4 points
Estimated blood loss (cc)	>1,000	601-1,000	101-600	≤100	
Lowest mean arterial pressure (mm Hg)	<40	40-54	55-69	≥70	
Lowest heart rate (bpm)	>85	76-85	66-75	55-65	≤55

Source: Dr. Regenbogen

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