Postop Infection Rates Increased in 2001-2006

BY MITCHEL L. ZOLER

LAS VEGAS — The pathogens causing postsurgical infections were not controlled by the steps that hospitals took in recent years to fight the infections, according to U.S. sample data on more than 183,000 hospitalized patients.

VITALS

Major Finding: The incidence of postoperative infections following elective colectomy or cholecystectomy in U.S. hospitals in 2006 exceeded the rates in 2001, despite widespread adoption of infection-control measures.

Data Source: Data from more than 180,000 surgical patients collected in the Nationwide Inpatient Sample from more than 1,000 hospitals in 38 states.

Disclosures: Dr. Davis reported no relevant disclosures.

Most U.S. hospitals were participating in the Surgical Care Improvement Project (SCIP) by 2006 because that year the Centers for Medicare and Medicaid Services began imposing a reimbursement penalty on hospitals that failed to report their compliance with the SCIP, Dr. John M. Davis said at the annual meeting of the Surgical Infection Society. A portion of the SCIP was designed to cut postoperative infection rates through steps such as antibiotic prophylaxis and surgical site preparation.

Despite widespread compliance, postoperative infection rates in patients undergoing elective colectomy or cholecystectomy in 2006 significantly surpassed the rates at the same hospitals in 2001, said Dr. Davis, a professor of surgery at Jersey Shore University Hospital in Neptune, N.J.

Dr. Davis attributed the increased infection rates to ongoing changes in the pathogens that surgical patients encounter while hospitalized. He said he believed that the infection picture in 2006 would have been far worse if the SCIP infection-control program had not been in place.

"There is a huge reservoir of very drug-resistant organisms, and their prevalence increased over the time period that we looked at," Dr. Davis said in an interview.

Increased levels of vancomycin-resistant enterococci, methicillin-resistant *Staphylococcus aureus*, and gram-negative pathogens such as *Enterobacter* and *Acinetobacter* were seen during the study period, he said.

And many pathogens are now resistant to cefazolin, which has been a mainstay prophylactic antibiotic for patients undergoing surgery.

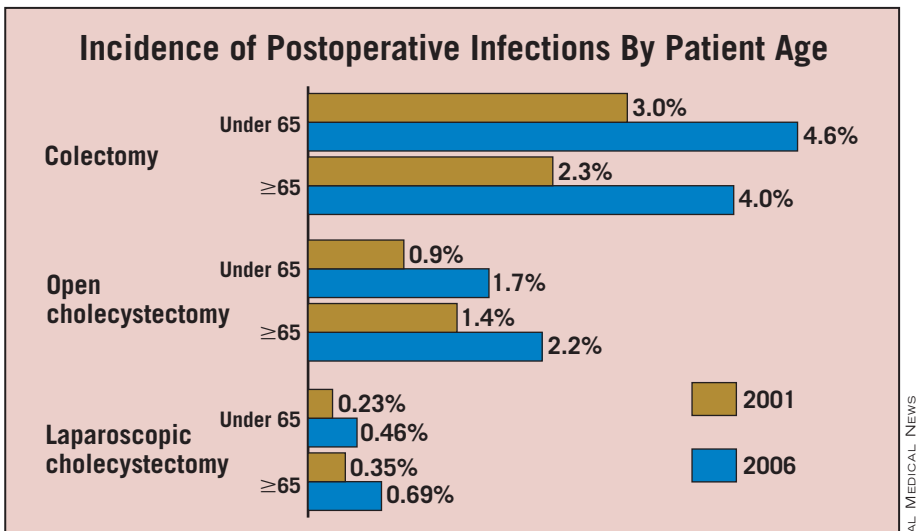
The increased risk for postsurgical infection with these pathogens could be blunted by further improvements in the infection-control steps taken in hospitals, such as better skin preparation techniques and treatment with higher doses of or different prophylactic antibiotics that better suit current pathogen risks and patient weight, Dr. Davis said.

"We may have to intensify how we manage skin prep and the dosing of antibiotics," he said.

Another step would be to change the timing when prophylactic antibiotics are administered, Dr. Davis said.

He and his associates analyzed data collected in 2001-2006 by the Nationwide Inpatient Sample, a program of the Healthcare Cost and Utilization Project, from more than 1,000 hospitals in 38 states. The data included came from 90,596 patients undergoing elective colectomy, 72,920 patients undergoing elective laparoscopic cholecystectomy, and 19,706 patients undergoing elective open cholecystectomy.

The analysis showed that the incidence of postoperative infections in all three types of patients in 2006 significantly exceeded the rates in 2001. (See box.) Postoperative mortality rates did not change significantly between 2001 and 2006. ■



Notes: Based on data from 183,222 patients in the Nationwide Inpatient Sample. All between-group comparisons are statistically significant.
Source: Dr. Davis

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MY TAKE

Project Did Not Live Up to Promise

Many of the physicians who developed the Surgical Care Improvement Project, myself included, hoped that the preventive measures promoted by the program would lead to reduced postoperative infection rates and better patient outcomes. The findings reported by Dr. Davis indicate that the promise of the program has not been fulfilled.

In addition, the infection rates seen in the Nationwide Inpatient Sample data suggest substantial underreporting of postoperative infection rates by hospitals. Two recent randomized, controlled studies of prophylactic antibiotics in patients undergoing colon surgery showed postoperative infection rates of about 20%. But the Nationwide Inpatient Sample data reported by Dr. Davis showed rates of 3%-4%.

DONALD E. FRY, M.D., *is a surgeon and executive vice president for clinical outcomes management at Michael Pines & Associates in Chicago. He had no disclosures relevant to this topic.*

Four-Factor Model Predicts Vascular Surgery Site Infection

BY MIRIAM E. TUCKER

ATLANTA — Preoperative patient factors were moderately predictive of surgical site infection risk in a retrospective case-control study of 253 patients undergoing elective vascular surgery.

Previous scoring systems also have been predictive of risk for surgical site infections (SSIs), but these are based on a combination of pre-, peri-, and postoperative factors. Thus, the scores aren't helpful for gauging risk in individual patients prior to surgery.

Knowing risk before surgery could allow the pursuit of nonsurgical options as well as guide infection prevention processes in patients who are shown to be at high risk, Dr. Surbhi Leekha and her associates said in a poster at the Decennial International Conference on Healthcare-Associated Infections.

Further, the most commonly used risk stratification tool, the National Nosocomial Infections Surveillance System (NNIS) risk index (Am. J. Med. 1991;91:152S-7S), does not perform well for "clean" procedures such as cardiovascular surgery, said Dr. Leekha and her associates, of the Mayo Clinic, Rochester, Minn.

The study population included patients who had undergone elective vascular (abdominal aortic and peripheral arterial) surgery at the Mayo Clinic from 2003 through 2007. A total of 87 patients who developed SSIs requiring hospitalization were included, and were matched with 166 controls who had undergone the same type of procedure on the same day but did not develop an infection.

There were no significant differences between cases and controls in age, sex, diabetes, smoking, alcohol use, chronic kidney disease, liver disease, weight loss, immunosuppressive therapy, and presence of skin ulcers. In multivariate analysis, preoperative variables that were significantly associated with SSI risk included critical ischemia (odds ratio 2.91), previous SSI (OR 6.29 with previous surgery, OR 1.40 with no previous surgery), previous peripheral revascularization (OR 2.55), and chronic obstructive pulmonary disease (OR 2.22).

A preop score model was developed in which 1 point each was given for COPD, critical ischemia, and previous peripheral revascularization and 2 points for previous SSI. The concordance statistic (c-statistic) for the preop score model was 0.73, compared with 0.50 for the NNIS score, Dr. Leekha and her associates reported.

A c-statistic of 1.0 indicates that the predictions are perfectly concordant with the actual outcomes, while 0.5 indicates that the predictions are no better than random chance. Thus, "based on these data, NNIS performs no better than a coin toss," Dr. Leekha said in a follow-up interview.

The NNIS, the national standard for all types of surgeries, has been shown to perform poorly for cardiac surgery. Its performance for vascular surgery appears to be similar, possibly because the patients are similar in two of the three NNIS components—type of surgery (type 1/clean) and American Society of Anesthesiologists score of III or IV, she explained in the interview.

In their poster, Dr. Leekha and her associates recommended that patients predicted to be at high risk should be observed for wound problems and early intervention/wound care, but added that prospective validation of this tool is still required. ■

Disclosures: *Dr. Leekha stated she had nothing to disclose.*