Study points to savings with infection-screening program before TJR

By Terry Stanton

Reduction in infections offsets screening costs

The high cost of revision joint arthroplasty can make it worthwhile to screen for Staphylococcus aureus (MRSA) and other bacterial contaminants, according to a paper presented by James D. Slover, MD, at the 2010 Annual Meeting.

Dr. Slover and colleagues at the NYU Hospital for Joint Diseases sought to determine if preoperative universal screening for Staphylococcus aureus and a decolonization program in patients undergoing total joint replacement (TJR) would reduce morbidity and associated costs enough to justify the expense of the program. Working with an assumed cost of about $15,000 for a primary knee replacement and $70,000 for a septic revision procedure, they anticipated that the cost of implementing a universal screening program would be recouped by small decreases in the infection rate, but they sought to establish more precise parameters by which a program may be deemed cost-effective.

For the study, all patients in the preadmission testing program for primary hip or knee replacement participated in the screening. All were given a prescription for an antibiotic (mupirocin), and a preoperative nasal culture was obtained. Patients who complied with the prescription and had a culture that was positive for methicillin-sensitive S. aureus (MSSA) received traditional perioperative prophylaxis with a cephalosporin. If a compliant patient's nasal culture was positive for methicillin-resistant S. aureus (MRSA), vancomycin was used.

Noncompliant patients who had positive cultures received mupirocin in addition to the traditional perioperative prophylaxis; noncompliant patients who had negative cultures received cephalosporin perioperatively.

Dr. Slover said that he and his colleagues have not tracked enough patients to draw definitive conclusions about the impact on infections and the resulting cost savings—a process that “will take some time given the numbers that will be needed to have statistical significance.” Preliminary data from 1,300 patients indicate that the screening program reduced the infection rate from 1.5 percent to 1.0 percent, said co-author Joseph A. Bosco, MD. The 1.5 percent base figure is consistent with the rates of infection reported in the literature, as are the assumed costs for the surgical procedures and an estimated $105 per patient cost for the screening and prophylaxis measures.

According to Dr. Bosco, in a hypothetical group of 1,000 patients, such a screening program will prevent 5 infections. With a total screening cost of $105,000, “it costs $21,000 to prevent each infection. Because treating an infection costs $75,000, this is a cost-effective protocol,” he said.

Model results

The authors also developed a model to demonstrate the reduction in infections required for a screening program to be cost effective. Under the model, a program that reduces infection rates by more than 40 percent—ie, achieving a revision rate of 0.6 or less—is cost effective in all cases.

A two-way sensitivity analysis shows the cost-effectiveness of a screening program for total joint arthroplasty (TJA). The orange represents profiles in which a screening program is cost-effective. A screening program that reduces infection rates by more than 40 percent (revision rate of 0.6 or less) is cost effective in all cases.

“any statistically significant reduction will be highly cost effective. If we can establish that, then screening and decolonization are likely to become a widely used preoperative infection control intervention.”

The other authors of “Cost-effectiveness of screening and decolonization of S aureus for reducing surgical infections” are Janet Haas, MD, Michael Phillips, MD, and Igor Immerman, MD.

Disclosure information: Dr. Slover—Smith & Nephew, Stryker; Dr. Haas—Otsuka Pharmaceutical; Dr. Bosco—Ortho Mitek, Small Bone Innovations, Exactech, Hand Innovations, Stryker; Dr. Phillips and Immerman reported no conflicts.

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