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Oral Session

Different prevention strategies in immunocompromised patients

A COMPUTER SIMULATION MODEL OF THE COST-EFFECTIVENESS OF ROUTINE STAPHYLOCOCCUS AUREUS SCREENING AND DECOLONIZATION AMONG LUNG AND HEART-LUNG TRANSPLANT RECIPIENTS

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Objectives. We have shown that methicillin-resistant *Staphylococcus aureus* (MRSA) infections following lung transplant were caused by strains identified pre-transplant, suggesting that systematic decolonization protocols may be effective at preventing disease. Our objective was to model the cost-effectiveness and economic value of routine peri-operative *S. aureus* screening and decolonization of lung and heart-lung transplant recipients from hospital and third party payer perspectives.

Methods. We used clinical data from 596 lung and heart-lung transplant recipients to develop a model in TreeAge Pro 2009 (WilliamSPORT, MA, USA). Data were collected from the Cardiothoracic Transplant Program at the University of Pittsburgh Medical Center. Consecutive lung and heart-lung transplant recipients from January 2006 to December 2010 were enrolled retrospectively. Sensitivity analyses varied *S. aureus* colonization rate (5% to 15%), probability of infection if colonized (10% to 30%), and decolonization efficacy (25% to 90%). Each simulation sent 1,000 lung and heart-lung transplant recipients through the model 1,000 times for a total of one million trials with unique outcomes.

Results. Baseline rates of *S. aureus* colonization, infection and decolonization efficacy were 9.6%, 36.7%, and 31.9%, respectively. Screening and decolonization was economically dominant for all scenarios tested, providing more cost savings and health benefits than no screening. Savings per case averted (2012 \$US) ranged from \$73,567 to \$133,157 (hospital perspective) and \$10,748 to \$16,723 (third party payer perspective), varying with the probability of colonization, infection, and decolonization efficacy. Using our clinical data, screening and decolonization led to cost savings per case averted of \$240,602 (hospital perspective) and averted 6.7 *S. aureus* infections (4.3 MRSA and 2.4 MSSA); 89 patients needed to be screened to prevent one *S. aureus* infection. For the various scenarios, the rate of colonization and probability of infection had a greater effect on the number of cases averted than decolonization efficacy. Especially at low colonization rates, the efficacy of the decolonization had little effect on the number of cases averted. As the probability of colonization increased, the gains by increasing decolonization efficacy became more prominent by averting more cases.

Conclusions. Our data support routine *S. aureus* screening and decolonization of lung and heart-lung transplant patients, and suggest that such strategies may be more efficient than in other surgical populations.