Antimicrobial Resistance and Its Impact on Transplantation

Antimicrobial resistance is a growing concern in the United States. In 2019, the Centers for Disease Control and Prevention estimated that there were 2.87 million antibiotic resistant infections annually with more than 35,000 deaths related to infections with antibiotic resistant bacteria. Antimicrobial resistance is a significant problem in transplantation, contributing to increased cost of care and poorer outcomes, including decreased patient and transplanted organ survival, and increased deaths on transplant waiting lists. Rates of antibiotic resistant bacteria in people either awaiting transplantation, or those who have been transplanted, have been estimated to range between 30 and 80 percent, depending on the bacteria and the type of transplant.

Transplanted patients and those awaiting transplantation are at special risks for infections with resistant organisms due to their increased exposure to hospital environments, including intensive care units, frequent need for invasive procedures especially around the time of transplantation, and increased antibiotic exposure. Transplant patients are at a greater risk for infection with resistant organism than the general population given their use of immunosuppressive medication which reduces their ability to combat infections. These factors allow the transplant recipient to serve as a reservoir of resistant bacteria, potentially transmitting these infections to other patients and close contacts.

The solution to this problem is complex, and the American Society of Transplantation (AST) supports a multi-tiered approach to combating the challenge of antimicrobial resistance, in keeping with measures outlined by the CDC and the Infectious Diseases Society of America. Initiatives must be directed at drug development, measures to reduce the spread of these resistant organisms, and improved early detection and diagnostic systems.

Because resistant organisms are currently a major threat to our patients, we must have systems in place to deal with this issue now. In the past 10 years, the development of new antimicrobial agents that can combat these difficult to treat infections has slowed. Given the high cost of developing and implementing clinical trials for what may be a limited return on investment, large pharmaceutical companies have reduced research efforts aimed at new antimicrobial drug development and smaller companies focused on the development of these agent are struggling to survive. The AST supports FDA efforts to help rebuild the pipeline of new antibiotics and initiatives such as the 10 by ’20 initiative to foster global research and development to produce 10 new systemic antibiotics by 2020. The AST also supports the FDA plan to develop enhanced diagnostics platforms for rapid identification of these organisms and susceptibility testing in conjunction with the new drug development.

Although the development of new medications is critical, clearly this will not be a fast nor lasting solution, by itself, to the problem of resistance. Health care providers and patients must work together now to stem the explosion of resistant organisms. This requires the judicious use of those agents that are currently available. Many hospitals have instituted antimicrobial stewardship programs that are designed to promote the appropriate use of antimicrobials, discouraging the widespread use of broader spectrum drugs for inappropriate indications. These programs are successful at reducing the burden of resistant organisms in participating centers. Unfortunately, they are costly to maintain as they are not reimbursable initiatives and require the ongoing involvement of qualified health care providers, including infectious diseases trained physicians and specialized pharmacists, to ensure the quality and adherence to these initiatives. Hospitals and health care settings, including long term care facilities, must be encouraged to develop these programs and they should be rewarded for their participation.

If we are going to be successful in decreasing the spread of resistant organisms in the United States, participation of the entire health care team will be required. This means that individuals involved in the care of our patients, and those with the ability to develop new technologies and medications, must form a partnership committed to this endeavor. On behalf of our patients, who are at greatest risk from these pathogens, the AST supports initiatives for the development of new drugs and diagnostics, as well as those initiatives designed to educate and treat our patients judiciously for infections.

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