

Antibiotic Resistance and its Impact on Transplant Patients

For more than half a century, antibiotic drugs have ensured that potentially life-threatening bacterial infections are treatable. Today, however, more and more bacterial infections fail to respond to antibiotic treatment. A federal task force recently warned that antibiotic resistance is “a growing menace to all people” and concluded that if nothing is done, treatments for common infections will become “increasingly limited and expensive-*and, in some cases, nonexistent.*”

Antibiotic resistance poses a threat to everyone, but transplant patients - a group that included nearly 23,000 Americans in the year 2000 - are at particular risk. Infection and rejection are the two main barriers to a successful organ transplant. A transplant patient receives drugs that intentionally suppress the immune system as an important step in keeping the patient's body from rejecting the transplant. These drugs are usually administered for an extended period of time, or even on a lifelong basis. This constant suppression of the immune system makes the patient much more susceptible to bacterial infections, and thus much more likely to need antibiotics.

In addition, solid-organ transplant patients are roughly three times more likely to die from surgical-site infections or other complications than are healthy people undergoing surgery. Furthermore, some types of transplants, such as kidney, may cause ongoing problems with urinary tract infections requiring antibiotic treatment. In short, effective antibiotics are critical to transplant patients; without them, this vulnerable population would be at extreme risk of frequent and potentially fatal infections.

Although careful use of antibiotics can result in the emergence of antibiotic-resistant bacteria, inappropriate use greatly accelerates this process. The more often bacteria are exposed to antibiotics, the more resistant they become. Because bacteria reproduce rapidly, these antibiotic-resistant bacteria can spread efficiently. Unlike higher organisms, bacteria can transfer DNA to other bacteria that are not their offspring, and even to members of completely unrelated bacterial species. In effect, bacteria can teach one another how to outwit antibiotics.

Antibiotic resistance carries a significant economic toll as well as a medical one. The congressional Office of Technology Assessment calculated that resistance by just six types of bacteria increased hospital treatment costs by \$1.3 billion as of 1995. Few new drugs are now in the pipeline, and any new antibiotics will be considerably more expensive than existing ones; indeed, by some estimates, the research and development costs for a new drug top \$800 million.

Although the misuse of antibiotics in human medicine has been well publicized, less attention has been paid to the serious overuse of antibiotics in agriculture. By one estimate, 80 percent of all antibiotics and related drugs (antimicrobials) sold in the United States are used in livestock production. The lion's share-roughly 70 percent of the total-are fed to healthy farm animals to promote growth and prevent diseases that would otherwise result from the unsanitary conditions found in overcrowded agricultural facilities. About half of those drugs are identical or closely related to medicines used in treating humans.

Because of the growing health crisis of antibiotic resistance, which could render these “wonder drugs” useless in treating infections, the American Medical Association now opposes the routine feeding of antibiotics to healthy farm animals. The American College of Preventive Medicine, the American Public Health Association, and the World Health Organization have taken similar positions. A National Academy of Sciences report estimates that eliminating all such uses in poultry, cow, and swine production would cost U.S. consumers only about \$5 to \$10 per person annually.

The Centers for Disease Control and Prevention has observed that “decreasing inappropriate antibiotic use is the best way to control resistance.” Key steps in doing so include adoption of policies aimed at ending the inappropriate use of antibiotics in agriculture, as well as continued implementation of programs to educate patients, parents and physicians about the need to use antibiotics more sparingly.

In particular:

- Congress should phase out the routine feeding of medically important antibiotics to healthy livestock and poultry and other inappropriate uses of vital antibiotics in agriculture. S. 2508, introduced by Sen. Edward M. Kennedy, and H.R. 3804, introduced by Rep. Sherrod Brown, would accomplish these objectives.
- Producers and marketers of meat and poultry should voluntarily agree to stop selling or buying meat produced with routine feeding of antibiotics to healthy animals, and pharmaceutical companies should stop producing antibiotics for such use in animals.
- Finally, those who decide which meat products to purchase - whether an individual shopper buying a few pounds of meat during a weekly trip to the grocery store, or a food-service corporation that purchases millions of pounds in a single transaction - should select meat produced without the inappropriate use of antibiotics.

Unless we act now, we face a future of untreatable bacterial infections. Transplant patients will be among the first to pay the price.

For a full report on antibiotic resistance and vulnerable groups, see www.keepantibioticsworking.com/vulnerable.