A Fresh Look at C. Diff Infection in the US

By the Water Quality and Health Council

Bacterial superbug “C. diff” infected nearly one-half million people in the US in 2011, causing inflammation of the colon and deadly diarrhea. The infection killed over 15,000, but was found associated with an estimated 29,000 deaths, according to a new study published in The New England Journal of Medicine. The director of the Centers for Disease Control and Prevention (CDC), Dr. Tom Frieden, said the study underscores two critical strategies for controlling C. diff: smarter use of antibiotics and improved infection control in healthcare environments (see CDC Newsroom article).

C. diff, formally known as “Clostridium difficile,” is the most common cause of health care-associated infections in the US. It is an antibiotic-resistant germ, which is how it earned its “Superbug status.” Most patients infected with C. diff, say the study authors, “had either inpatient or outpatient health care exposures before disease onset.” The authors note that a person’s risk of C. diff infection increases with age, afflicting thousands of residents of US nursing homes every year. Additionally, one in five patients who are infected with C. diff experience at least one repeat infection. Not good news for our aging population.

According to Web MD, two things must happen for C. diff infection to occur:

- There must be a disturbance of the ecological balance of the colon’s normal bacteria, and
- Spores of the bacterium must be ingested.

Smarter Use of Antibiotics

Antibiotics are prescribed to destroy disease-causing bacteria, but they also may destroy some of the normal, protective microorganisms present in the human gastrointestinal tract. Antibiotic resistant bacteria, such as C. diff, if ingested, may proliferate when gut bacteria are disturbed. CDC notes that people on antibiotics are 7-10 times more likely to develop C. diff infections. As we discussed in previous articles, excessive and unnecessary use of antibiotics exacerbates antimicrobial resistance.

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1 Lessa et al. state that in 2011, 29,300 patients died within 30 days after being diagnosed with C. diff. These are C.diff-associated deaths. They also indicate that deaths attributed to C. diff infection directly are estimated at about 50% of this figure, or approximately 15,000.

Improved Infection Control

*C. diff* forms hardy spores that can survive on dry surfaces for months according to *Web MD*. People infected with *C. diff* have millions of spores of the bacterium in their feces. Infection control in healthcare settings is critical to controlling *C. diff*, which can be transmitted via the fecal to oral route through improper hand washing and insufficient surface disinfection.

Among the CDC recommendations for controlling infection:

- Clean room surfaces with EPA-approved, spore-killing disinfectant (such as chlorine bleach)
- Wear gloves and gowns when assisting persons with *C. diff*
- Wash hands thoroughly and often when interacting with persons with *C. diff*
- Notify healthcare facilities when patients with *C. diff* are transferred from one facility to another so that proper precautions can be taken to avoid the spread of infection.

Introducing CARB

CDC is taking an aggressive approach to reducing *C. diff* and other antibiotic-resistant bacterial infections through its National Strategy to Combat Antibiotic Resistant Bacteria (“CARB”). The CARB program will work to:

1. **Slow the development of resistant bacteria and prevent the spread of resistant infections.**
2. **Strengthen national one-health surveillance efforts to combat resistance.**
3. **Advance development and use of rapid and innovative diagnostic tests for identification and characterization of resistant bacteria.**
4. **Improve international collaboration and capacities for antibiotic resistance prevention, surveillance, control and antibiotic research and development.**