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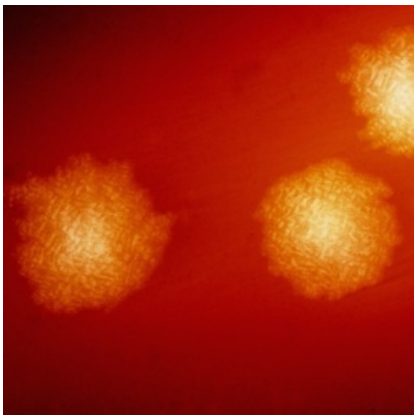
C. diff Antibiotics Link, Rapid Wound Infection Detection



Overuse of specific antibiotics is associated with the development of certain strains of antibiotic-resistant *C. difficile*, according to a retrospective case control study published in Antimicrobial Agents and Chemotherapy (Wieczorkiewicz et al. 2015).

Lead author, Stuart Johnson, MD, of Loyola University Health System (LUHS), Loyola University Chicago Stritch School of Medicine (SSOM) and the Hines VA Medical Hospital said that the findings support targeting specific antibiotics for antibiotic stewardship monitoring programmes.

Dr. Johnson and a team that included *C. diff* expert Dale Gerding, MD, identified 143 patients with first episode C. difficile infection (CDI) between 2005 and 2007 in a single U.S. hospital. 103 (72%) of these patients were infected with the BI/NAP1/027 C. diff strain, which is highly resistant to fluoroquinolones and macrolides. While most of the patients received multiple antibiotics within six weeks of being diagnosed with CDI, fluoroquinolone and macrolide exposure was more frequent in patients with B1 strains, and the C. difficile bacteria recovered from the stool specimens of these BI-infected patients also showed high-level resistance to these antibiotics.

Johnson argues that antibiotic exposure is the most important risk factor for C. difficile infection. "We know that antibiotics wipe out beneficial flora in the gut, making patients susceptible to a C. diff infection. The other role of antibiotics highlighted in our study is that overuse of specific antibiotics may facilitate infection due to C. diff strains that are highly resistant to those antibiotics."

See Also: 'Good' Bacteria Could Fight Hospital Infections

Rapid Method to Detect Wound Infections

Researchers have developed a promising rapid new method to detect infection in wounds, with results available in less than a minute compared to current overnight methods and requiring only 7.5 µL of sample.

Victoria Shanmugam, MD, George Washington University, Director of the Division of Rheumatology at the GW School of Medicine and Health Sciences and co-authors Edgar Goluch, PhD, DiPietro Assistant Professor of Chemical Engineering at Northeastern University College of Engineering, and Agnes Chan, PhD, assistant professor at the J. Craig Venter Institute, developed a method that uses an electrochemical detection strategy to identify molecules produced by the bacteria *Pseudomonas*, which commonly infects chronic wounds. The

study is published in Wound Repair and Regeneration (Wieczorkiewicz et al. 2016).

The study used a cheap, disposable electrochemical sensor that immediately reveals bacteria based on the detection of pyocyanin, a bacterial quorum sensing molecule produced by *Pseudomonas*. The probe correctly identified the presence of the bacterium 71 percent of the time and correctly identified absence of the bacterium 57 percent of the time.

Dr. Shanmugam, who is principal investigator of the WE-HEAL study, a National Institutes of Health-funded study investigating the interplay of the host immune response and wound bed microbiome in patients with chronic wounds, said that further development could potentially provide physicians with a point-of-care diagnostic tool, leading to earlier specific directed antibiotic therapies.

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