Testing and Treatment for Clostridia Species

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Clostridia bacterial infection is one of the most common and difficult gastrointestinal disorders to treat. Some of the common species of Clostridium are: Clostridium tetani that causes tetanus, Clostridium botulinum that causes the food poisoning botulism, and Clostridium perfringens and Clostridium difficile that cause diarrhea. Clostridium perfringens, Clostridium novyi, Clostridium bifermantans, Clostridium histolyticum, Clostridium septicum, and Clostridium fallax may all cause gangrene. Many other species of Clostridium are normal inhabitants of the intestinal tract but may not be scientifically described and are not even named as a species. The major reason for a lack of knowledge about these organisms is that they are strict anaerobes that cannot tolerate oxygen. Since they must be processed in an oxygen free environment, many hospital laboratories do not have the capability to identify these organisms. Approximately 100 different species of Clostridia bacteria exist in the intestinal tract and most are considered to be probiotics or beneficial bacteria. Clostridia species were identified in all stool samples of normal individuals at a concentration of about 10 billion cells per gram of stool. Clostridium ramosum has been reported as the most common Clostridium species in one study while Clostridium perfringens was very frequent in another study.

One of the most common types of Clostridia infections is called Clostridium difficile or C. difficile. It is the most common nosocomial infection (infection acquired in a hospital, nursing home, or other medical facility) and nosocomial cause of death in the United States. It affects hospitalized patients as well as outpatients. A very high percentage of people are colonized with this bacteria, including 5%-15% of healthy adults, more than 80% in neonates and newborns, and 50%-60% of patients in long-term care facilities. Infants lack receptors on the mucosa surfaces of the intestine that bind Clostridia so they do not have severe symptoms even when colonized. All Clostridia share a common ability that is characteristic of the group (genus) called spore formation. The growing or vegetative Clostridia bacteria are readily killed when exposed to heat, oxygen, or certain antibiotics. To preserve themselves, the Clostridia develop a thick wall and become spores that can live for long periods of time on surfaces like bathroom fixtures, sinks, and toilets. Hand wipes with alcohol may actually cause these organisms to spread more effectively. Hand washing with plain soap and water to physically remove the organism and its spores is the most effective method for prevention of spreading this organism. However, common antibacterial soaps containing PCMX, triclosan, and hexachlorophene may be absorbed through the skin and cause toxicity. Virtually the only thing that can kill the spores is dilute bleach such as Clorox® whose active ingredient is hypochlorous acid.

A number of stool tests evaluate Clostridia species but are not able to differentiate many of the beneficial Clostridia from the pathogenic strains. If total Clostridia are high or low, what does it mean? Beneficial strains high? Pathogenic strains high? A mixture of strains high or low? The answers are unknown.

The value of The Great Plains Laboratory's Organic Acid Test is that the Clostridia markers themselves cause toxicity by inhibiting the conversion of dopamine to norepinephrine, leading to an imbalance of these neurotransmitters in the brain and peripheral sympathetic nervous system. (Visit http://www.gpl4u.com/home/eng/articles/Interference%20in%20dopamine%20conversion%20to%20norepinephrine%20FINAL.pdf to read the article: Inhibition of Dopamine Conversion to Norepinephrine by Clostridia Metabolites Appears to Be Major cause of Autism, Schizophrenia, Other Neuropsychiatric Disorders).
The Great Plains Laboratory's Urine Organic Acid Test employs two useful markers HPHPA and 4-cresol (p-cresol). The 4-cresol test is specific for C. difficile while the HPHPA is produced by multiple Clostridia species. The 4-cresol is produced in such high amounts that it inhibits the growth or kills other bacteria that are growing in the intestine or in sewage treatment plants, while the C. difficile is resistant to the high concentrations of the 4-cresol. Some stool tests evaluate C. difficile separately. The problem with this is that my reviews of organic acid tests reveal that the C. difficile marker 4-cresol is only positive in about 10% of the positive Clostridia cases, versus the HPHPA marker being positive in 90% of positive cases. Thus, perhaps 90% of cases of Clostridia affecting neurotransmitter metabolism may be missed using stool testing.

In one case, parents showed me the stool test results of their child with autism. They had done a stool test using a laboratory that used DNA technology. The total Clostridia was reported as extremely low, but The Great Plains Laboratory test found high levels of the HPHPA marker. If the parents had relied on the stool test alone, their child might have missed an important therapeutic intervention that can restore normal neurotransmitter balance. The beauty of The Great Plains Laboratory's Organic Acid Test is that it is not necessary to determine particular species of Clostridia because it is the HPHPA itself that is neurotoxic.

The nucleic acids of Clostridia are extremely diverse. The content of the nucleic acid bases guanosine and cytosine (G+C) is used to classify bacteria species. The G+C content of DNA in Clostridia species ranges from 21-54 %. The majority of intestinal species have G+C contents in the lower half of this range. Ribosomal RNA cataloging confirms that Clostridia occupy six independent sublines with multiple branches including non-Clostridia species. The failure to offer documentation on which species are being detected and how validation was performed should lead to caution by the user of such testing, especially when these tests are labeled “experimental.” Clostridia species are highly infectious due to the spore formation, and other family members should also be tested. When the person affected defecates and the toilet is flushed, the Clostridia spores can aerosolize and spread to other areas of the bathroom. Clostridia spores have been found on the toothbrushes of individuals with C. difficile infection. Thus, all bathroom surfaces should be cleaned with dilute (1:10) household bleach to kill spores and prevent reinfection of the infected person or infection of other family members or pets.

Treatment for Clostridia is challenging, though probiotic treatment has sometimes been effective. The antibiotics metronidazole and vancomycin are very effective in treating the growing vegetative cells of Clostridia but are ineffective against spores. Therefore, intermittent treatment protocols have evolved such that there is a waiting period without antibiotic treatment to allow antibiotic resistant spores to revert to their antibiotic susceptible vegetative forms. Use of such protocols markedly reduces the recurrence rate for Clostridia. A typical protocol is 10 days of continuous treatment followed by antibiotic treatment every 3 days for an additional 3 weeks.

The Great Plains Laboratory has found the Clostridia markers useful in the treatment of the most common bowel disorders like irritable bowel syndrome, Crohn's disease, ulcerative colitis, chronic fatigue syndrome, arthritis, seizure disorders, autism, and all psychiatric disorders including depression, attention deficit, schizophrenia, and Tourette's syndrome.
References


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