

Incidence of *Cryptosporidium* sp. in an Australian Outpatient Population & Treatment Considerations

*Statistical Analysis Reveals High Incidence of *Cryptosporidium* sp. in an Australian Out-Patient Population Second Only to *Blastocystis hominis**

A recent analysis of 470 consecutive stool specimens submitted to Diagnostic Insight for analysis by Metamatrix Clinical Laboratory revealed an incidence of 8.3% for *Cryptosporidium* sp. or a total of 39 stool specimens positive for *Cryptosporidium* sp. infection. The incidence of *Cryptosporidium* was second only to *Blastocystis hominis*.

Many people will remember the Sydney water crisis, which involved the supposed contamination of Sydney's main water supply, the Warragamba Dam by *Cryptosporidium* and *Giardia* between July and September 1998.¹ This incident led to a dramatic rise in the sales of bottled water and awareness of the diarrhea that can result from acute infection with *Cryptosporidium* and *Giardia*.

Sources of *Cryptosporidium*

Australian studies since this time have confirmed that in the absence of outbreaks due to contamination of drinking water supplies, the major risk factors for *Cryptosporidium* infection are swimming in public pools and contact with another person with diarrhoea.² Such cases are said to fall under the category of 'sporadic cryptosporidiosis'. Given the average Australian's affection for the pool, it is not unreasonable to expect that the multitude of aspiring 'Thorpedo's' may have a bearing on the relatively high rates of *Cryptosporidium* infection we have witnessed at Diagnostic Insight.

Effect of Water Quality & Treatment on Incidence of Sporadic Cryptosporidiosis

Contrary to popular opinion, water treatment is thought to have little effect on the incidence of sporadic cryptosporidiosis. This issue was explored by researchers from Monash University in a study published in 2002 in *Epidemiology and Infection*.³ Researchers compared the risk for sporadic cryptosporidiosis in Melbourne and Adelaide, which represent two extremes in raw water quality and treatment in Australia. Melbourne has a high quality source water from highly protected catchments which undergoes only minimal treatment with chlorination,⁴ whilst Adelaide has poor quality source water from unprotected catchments which undergoes full conventional water treatment including coagulation, sedimentation, filtration and chlorination.⁵ Despite these differences, risk factors for sporadic cryptosporidiosis were found to be similar for the two cities, with swimming in public pools and contact with a person with diarrhoea being most important. The consumption of plain tap water was not found to be associated with disease.

To Treat or Not To Treat

The dilemma for clinicians presented with a positive stool result for *Cryptosporidium* sp. is determining whether treatment is required. *Cryptosporidium* infection can often be asymptomatic and self-limiting in immunocompetent individuals. It is thought the likelihood that an individual will experience characteristic symptoms of diarrhea is related to the load of *Cryptosporidium*, with loads of 1 million parasites per gram of feces more likely to induce diarrhea. Decisions on treatment should also be guided by the patients' level of immunocompetence. Any patient that displays signs or symptoms characteristic of someone with a compromised immune system is a more likely candidate for treatment. Conversely, asymptomatic immunocompetent patients presenting with *Cryptosporidium* infection may be candidates for treatment with a non-pharmaceutical immune modulating agent such as colostrum.¹¹ Colostrum is known to positively affect both cellular and humoral immunity which play a role in modulating the intensity and duration of infection.¹¹

How To Treat

The issue of treatment for *Cryptosporidium* is further complicated by the fact that the standard recommended pharmaceutical treatment of nitazoxanide is not available in Australia except via special TGA exempt application. Furthermore, data on the efficacy of nitazoxanide in immunocompromised individuals is not very strong.⁶ As alluded to above, one treatment alternative that has received a lot of attention and study is bovine colostrum or specially formulated bovine anti-cryptosporidium hyperimmune colostrum immunoglobulin. This treatment has proved particularly promising in patients with acquired immunodeficiency syndrome (AIDS),⁷⁻¹⁰ who fall into the category of immunocompromised and thus are known to be at high risk of contracting *Cryptosporidium*. Given the strong scientific evidence behind the efficacy of colostrum for cryptosporidiosis in AIDS patients, it is reasonable to recommend such treatment be used for any immunocompetent patients infected with *Cryptosporidium*. Indeed, a study which tested the effects of supplementation with bovine hyperimmune anti-cryptosporidium colostrum immunoglobulin (BACI) on the incidence of diarrhea in healthy adults challenged with *Cryptosporidium parvum*, found a trend toward less diarrhea in patients receiving BACI versus placebo.¹¹

Summing Up

In summing up, it is our view that any patient who presents with *Cryptosporidium* sp. infection on the **GI Effects™ Profiles** should be treated with an immune modulating supplement such as bovine colostrum. There is a large body of literature on the positive effects of bovine colostrum in gastrointestinal infection due to its antibacterial effect, immune modulation activity and ability to neutralize lipopolysaccharides arising from gram negative bacterial pathogens.^{12,13} Individuals thought to be at higher risk of *Cryptosporidium* infection include children with generalised poor immunity, individuals who regularly use public swimming pools and individuals in contact with another person with diarrhea. It follows that individuals with *Cryptosporidium* infection should take necessary steps to avoid the preceding risk factors associated with risk of infection.

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