

Management of Waterborne Pathogens in Public Swimming Pools – Evidence needed

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Please cite this paper as: McManus, A, Bertolatti, D, Devine B. Management of Waterborne Pathogens in Public Swimming Pools-Evidence Needed. AMJ, 2009, 1, 2, 1-4. Doi 10.4066/AMJ.2009.46

The Problem

We are facing an outbreak of Cryptosporidiosis linked to public swimming pools. One week ago (27 February 2009), the Director of Communicable Disease Control (CDC) in New South Wales reported 200 cases of Cryptosporidiosis, 44 of them within a 24 hour period.¹ In the previous month (January 2009) there were 445 reported cases across Australia.² In addition, in 2008 there were 1974 cases reported and 2810 in 2007.^{3,4} In 2007, the South Australian Director of CDC issued a Health Alert following a four fold increase in cases (n=228 cases).⁵ In Western Australia there was a three fold increase (n=165) in the first three months of 2007 in comparison to the entire number reported during 2006.⁶ This concern is not only Australia-wide. In 2007 the Centers for Disease Control, Atlanta, USA issued a 'Cryptosporidium Outbreak Alert System' following at least 18 outbreaks in that country with the largest associated with 1900 people being hospitalised.⁷

Swimming pools are increasingly recognised as an important transmission route of cryptosporidiosis.⁸ Swimmers are infected through ingestion of waterborne faecal matter. The infective oocysts resulting from one Accidental Faecal Release (AFR) may be prolific (5×10^7 C.parvum oocysts). A swimmer swallowing just 10 ml of water would ingest an average of 200 oocysts, which is well above the dose capable of causing infection.⁹ The symptoms associated with cryptosporidiosis usually lasting up to two weeks include diarrhoea, dehydration, weight loss, abdominal pain, fever, nausea and vomiting. In immuno-compromised persons, the resultant infection can become chronic and result in death. There is no effective treatment available at present to treat cryptosporidiosis.¹⁰

The industry has indicated there is an least one AFR every week in most swimming pools throughout summer, with many pools reporting daily contaminations in high use toddler and hydrotherapy pools. Each of these events has the potential to spread infection. Not only does this pose a significant health risk to the public, there is also substantial cost to industry associated with treatment and long pool closures. As the effects of cryptosporidiosis is significant when compared to other common

diseases[9], there is an urgent need to develop guidelines that have the capacity to reduce the risk associated with AFR's in public recreational waters.

Possible Solution

Formative research has been conducted through the Curtin University in collaboration with The University of Western Australia, Murdoch University and the Leisure Institute of Western Australia to develop and test a protocol (standardised procedure) to manage AFR's in recreational waters. A research team (led by the authors) is currently seeking funds through the Australian Research Council to conduct a randomised control trial to extrapolate the successful findings from the pilot project into practice.

Current practice used to clean up and prevent contamination from faecal matter, though widely accepted across the industry, are not based on scientific evidence but experience and anecdotes. Members of the pool industry had shown great support for the planned research, believing it has the scope to further increase public confidence in the safety of pools by fine tuning exactly what steps are needed to be taken to contain AFR's. The findings could also help paediatric hospitals with therapy pools where infection with these pathogens can be particularly harmful to children with compromised immune systems.

Furthermore, the introduction of swimming pools in remote Aboriginal communities in WA has provided substantial benefits for the children. For example, there have been significant reductions in ear, eye and skin infections in children who regularly use these pools. It is therefore important to encourage people to continue to use swimming pools, whilst examining ways to reduce the risk of infection to swimmers.

Until more evidence is available, it is essential to educate the public about the risk of minimise ingested water from public swimming pools and ensure that all infants (and those with incontinent issues) wear appropriate 'aquatic' nappies.

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