Managing waterborne pathogens in public swimming pools: A pilot study

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Abstract

There have been numerous reports of swimming pool-associated outbreaks of *Cryptosporidiosis* and *Giardiasis* worldwide, including Australia. It is essential to ensure that effective measures are in place to manage faecal contamination incidents, the primary source of contamination of these pathogens in public swimming pools. There are no evidence-based guidelines for the management of faecal contamination incidents (FCI) in public swimming pools in Australia. The aim of the study is to develop, implement and evaluate guidelines to reduce the public health risk associated with *Cryptosporidium* and *Giardia* in public swimming pools in Australia. This research is particularly important both nationally and internationally as the endemic of *Cryptosporidium* and *Giardia* is increasing significantly. It is estimated that half of all Indigenous children are affected by these pathogens which can cause long-term disability or death. A random sample of public swimming pools from metropolitan, rural and remote Western Australia will be recruited into the study to assess the effectiveness of guidelines to minimize the risk associated with faecal contamination incidents (FCI). This paper will outline the piloting of these guidelines in two public swimming pools during 2004.

Introduction

- *Cryptosporidium* - most common non-viral cause of diarrhoea worldwide.
- Numerous swimming-pool outbreaks nationally/internationally.
- Symptoms – diarrhoea, dehydration, weight loss, abdominal pain, fever, nausea, vomiting.
- Can result in chronic illness or death in immuno-compromised.
- No effective treatment
- *Giardia* - recognised as major source of illness worldwide.
- Significant increase in swimming pool contaminations in Australia
- Symptoms – diarrhoea, abdominal pain, rapid weight loss.
- Chronic infection –malabsorption and long-term disability.
- Approx. 50% indigenous children infected with *Giardiasis*.

Aims of Study

- To reduce the public health risk associated with Faecal Contamination Incidents (FCI) in public swimming pools.
- To develop and trial a protocol for the management of FCI in public swimming pools.

Faecal Contamination Incident Management Guidelines (FCIMG)

Step 1. Exclusion of Patrons
Step 2. Pre-treatment water sampling
Step 3. Removal of Remaining Contamination
Step 4. Water Treatment and post-treatment after sampling
Step 5. Closure Period
Step 6. Super-chlorination
Step 7. Sending samples to Pathology lab
Step 8. Recording Procedures

Methods

Prior to implementation

- Observe usual procedures to manage contamination of pools.
- Interview managers of swimming pool complexes.
- Collect written guidelines for management of water body and FCI
- Collect physio-chemical/mircobiological results past 12 months.

Baseline

- Collect baseline physio-chemical and microbiological parameters in each pool in complexes involved in study.
- Randomise complexes to intervention or control.

Control pools

- Usual testing procedures.
- Collect sample of all FCI – forward for analysis within 24 hrs.
- Monthly backwater microbiolgical testing.

Intervention pools

- Daily physio-chemical testing.
- Staff training of new protocols.
- Follow new FCI Management Guidelines.
- Testing and recording as per new guidelines.

Pilot study results

Observation

- Average 2 FCI per week in public swimming pools.
- FCI daily in peak summer periods.
- Toddler/child pools and hydrotherapy pools most at risk.
- No standardised guidelines for management of FCI.
- Observations showed cross contamination of pools during clean-up of FCI.

Implementation of FCI Management Guidelines (FCIMG)

- All staff attended training for new FCIMG (n=9 staff).
- Suitable containers provided for samples.
- Pilot conducted over four weeks.
- All samples received by Path Centre within 24 hours.
- All staff supportive of development of FCIMG.

Significance of study

- Incidence of waterborne infections increasing significantly.
- Infections spread through faecal contamination incidents (FCI).
- One FCI may release up to 20,000 contaminants/litre.
- Ingestion of 10 mls of infected water enough to cause infection.
- First study to focus on development of evidence-based guidelines for management of waterborne pathogens in public swimming pools.
- Implications for use of guidelines throughout the world.

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