

- Title** Flocculant-disinfectant for point-of-use water treatment
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- Reference** Technology Review Report - 011/2016, online:
http://www.moh.gov.my/index.php/database_stores/store_view_page/30/290

Aim

To assess the efficacy / effectiveness, cost-effectiveness, safety, and organizational issue of flocculant-disinfectant for point-of-use water treatment.

Conclusions and results**Diarrhoea**

- No statistically significant difference in the number of diarrhoea episodes compared with the control, either for people of all ages 0.40 (95% CI: 0.14, 1.16) or for children under five 0.42 (95% CI: 0.13, 1.37). However, when one study (identified as possible outlier) was excluded, it became significant for all ages and under-fives.
- The two trials using odds ratios reported a statistically significant reduction in diarrhoea episodes for people of all ages 0.77 (95% CI: 0.65, 0.90) but not the under fives 0.86 (95% CI: 0.57, 1.29).

Microbiology

- Effectively reduced *E. coli* to the level of <1 CFU/100 ml (WHO standard)
- Reduction of *E. coli* was less compared to chlorine method and about the same with filtration method
- In high turbidity water compared with no treatment, high-dose formulation of flocculant-disinfection product has a higher effect in reducing *E.coli* while low-dose formulation had lower effectiveness
- Effective in reducing gram negative non-acid fast environmental bacterium but was not effective in reducing non-tuberculous *Mycobacterium*

Physical

Both high-dose and low-dose flocculant-disinfectant was effective in reducing turbidity (<5 NTU). One study reported an improvement in clarity in 92% of the time compared with 51% of the time for chlorine bleach users. It also effective in reducing smell and gave better taste than untreated water. Not all treatment with flocculant-disinfectant was associated with adequate residual chlorine level (0.2-5.0mg/l).

Heavy metal

Flocculant-disinfectant was effective in reducing arsenic in water [median concentration of arsenic in tube well water decreased by 88% and total urinary arsenic decreased by 42% ($p < 0.001$). There was no evidence retrieved on other heavy metal such as mercury, cadmium, cyanide, plumbum, etc.

Safety

There was no retrievable evidence on the safety of flocculant-disinfectant from US FDA. However, there was no adverse events reported in this review.

Cost/cost-effectiveness

Flocculation-disinfection when used for preventing diarrhoeal disease was strongly dominated by all other interventions (chlorination, filtration, solar disinfection) with an average cost-effectiveness ratio (ACER) of US\$472 and US\$1117 per DALY averted in sub-Saharan African countries and South East Asian countries respectively.

Organizational

The utilisation of flocculant-disinfectant was lower compared to the other water treatment methods among self-reported users. Minimal training and instruction is needed. Flocculant-disinfectant was acceptable and more frequently preferred by respondents.

Recommendations (if any)

Flocculant-disinfectant for point-of-use water treatment may be used in emergency situation such as natural disasters but not for routine use.

Methods

Electronic databases were searched through the Ovid interface: Ovid MEDLINE® In-process and other Non-indexed citations and Ovid MEDLINE® 1946 to present, EBM Reviews - Cochrane Central Register of Controlled Trials - April 2016, EBM Reviews - Cochrane Database of Systematic Reviews - 2005 to May 2016, EBM Reviews - Health Technology Assessment - 2nd Quarter 2016, EBM Reviews - NHS Economic Evaluation Database 2nd Quarter 2016. Searches were also run in PubMed database and U.S. Food and Drug Administration (USFDA) website. Google and Google Scholar was also used to search for additional web-based materials and information. No limits were applied. Additional articles were identified from reviewing the references of retrieved articles. Last search was conducted on 31st May 2016.

Further research/reviews required

No

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