

References

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Integration of water, sanitation and hygiene intervention delivery at health facilities with a reactive ring vaccination programme to reduce cholera

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Globally there are estimated to be 2.8 million cholera cases annually, resulting in 95 000 deaths.¹ Ali and colleagues recently reported results on the spatiotemporal risk for cholera and estimated overall and indirect cholera vaccine effectiveness of a ring vaccination programme, by analysing data from an oral cholera vaccine (OCV) trial in Kolkata, India.² Cohorts in close proximity to a cholera case had a 5–11 times higher risk of cholera during the 1-month period after the onset of case illness when compared with cohorts not exposed to a case. High OCV coverage for populations within 25 m of a cholera case resulted in an overall and indirect vaccine efficacies of 91% and 93%, respectively, during this 1-month high-risk period when compared with low-vaccine coverage areas. These promising findings show the high level of protection that could potentially be achieved if a reactive ring vaccination programme was conducted around identified cholera cases. This is of particular importance given the limited supply of OCV globally.

Consistent with this study, previous studies have found household contacts of cholera patients to have a 130–150 times higher risk of developing a cholera infection than the general population during the 1-week period after onset of illness in the index patient.^{1,3–5} This high risk is likely due to a shared contaminated environmental source or secondary transmission from infected household members.^{3,4} Most recently Debes and colleagues expanded on these previous studies by investigating the risk for cholera for all those living in close proximity to an index case in rural Matlab, Bangladesh. The authors reported that those living within 50 m of an index case were at a 20 times higher risk

of cholera during the 1-week period after the onset of case illness compared with those living near controls.⁶

The protective immunity conferred by OCV takes several days to develop. Therefore the 1-week period when those living in close proximity to a cholera case are at highest risk of cholera is the time when little or no vaccine protection would be conferred by a ring vaccination programme. In an effort to develop a targeted intervention for this high-risk population during the 1-week period when they are most susceptible, the Cholera-Hospital-Intervention-for-7-Days (CHoBI7) was developed.⁷ Chobi mean picture in Bangla, for the pictorial modules provided as part of this intervention. This intensive handwashing with soap and water treatment intervention is delivered by a promoter to cholera patients and their accompanying household contacts at the time of admission to a health facility, and is reinforced through home visits. CHoBI7's pictorial modules emphasize the importance of water treatment with chlorine and handwashing with soap during the 1-week high-risk period for cholera after onset of patient illness. In Bangladesh, this intervention included the distribution of chlorine tablets, soapy water made of water and detergent powder (a low-cost alternative to bar soap), a handwashing station, and a drinking water vessel with lid and tap.

The recent randomized controlled trial of the CHoBI7 intervention in Dhaka, Bangladesh, found that delivery of this targeted water, sanitation and hygiene (WASH) intervention resulted in a significant reduction in symptomatic cholera among household contacts of cholera patients during the 1-week high-risk period after onset of case illness.⁷ Furthermore, delivery of this 1-week intervention resulted in

sustained handwashing with soap and improved water quality in cholera patient households up to 12 months following the intervention.⁸ This result was consistent with findings from Deb and colleagues, who found that delivery of narrow-neck drinking water vessels and chlorine to cholera patient households in slums in Kolkata, India led to significant reductions in cholera infections among household contacts.⁹ The high efficacy of these interventions is likely attributed to the WASH interventions reducing the spread of cholera within patient households from infected individuals and from contaminated drinking water.

Given the limited supply of OCV globally and the delay in achieving vaccine protection conferred by a ring vaccination programme, a more comprehensive targeted package of interventions, beyond vaccine alone, is needed. Integration of an intensive WASH programme targeting cholera patients treated at health facilities and their household contacts with an OCV ring vaccination programme for those living in close proximity to the cholera case presents a promising approach for limiting cholera transmission and reducing the number of cholera infections. This intervention would provide protection against cholera for a high-risk population when they are most susceptible and would deliver OCV to a cholera hotspot where overall vaccine efficacy is likely high.

An intervention combining this type of targeted WASH intervention along with a targeted OCV campaign would require cholera patients to be quickly identified at health facilities, OCV to be readily available, and rapid response teams to be ready to intervene. This means a plan needs to be in place before cholera outbreaks occur. We recommend

that cholera-endemic countries determine the feasibility of integrating this approach into their cholera control plans.

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A note on the use of Egger regression in Mendelian randomization studies

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A large number of epidemiological studies use genetic variants as instrumental variables to infer causal relation-

ships.^{1,2} For a genetic variant to be a valid instrument in these so-called Mendelian randomization (MR) studies,

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