

## Podcast: The immunization against Cholera

Hello and good day to everyone. We warmly welcome you to our today's podcast on vaccination against Cholera. My name is Joel and I am a member of the health team of German Institute of Medical Mission, Difäm. My colleague Ute accompanies me today.

Cholera has been around for centuries. It is an unwanted guest, particularly during rainy seasons, in resource-limited settings. Outbreaks occur frequently in times of crisis and natural catastrophe. Cholera has the potential to kill especially vulnerable persons like children and old people.

Ute, can you update us quickly on cholera?

Sure, thanks, Joel. Cholera is a diarrhoeal disease caused by the bacteria vibrio cholera. Infection occurs when the bacteria find their way from faeces to mouth. Infection mainly occurs after drinking contaminated water or eating contaminated food. As is the case with typhoid fever, the cholera bacteria can only survive and reproduce in human beings. Animals are not involved in Cholera outbreaks. Cholera transmission is closely linked to a lack of clean water and sanitation facilities, like in urban slums and refugee camps. So, the provision of safe water and sanitation is critical to prevent and control the transmission of cholera.

The cholera bacteria has over 200 subtypes, but only two of them cause outbreaks. They are called O1 and O139. In the 19<sup>th</sup> century, the cholera bacteria started their journey across the globe from India. They caused huge epidemics with millions of deaths. Today, cholera is endemic in many countries.<sup>3</sup>

How many people become infected with cholera every year?

There are an estimated 1.3 to 4.0 million cases of cholera annually, and 21 000 to 143 000 deaths worldwide. The burden of cholera is greatest in Africa and southern Asia, with about 99% of all cases. Cholera affects people at all ages but half of the cases and deaths occur in children under 5 years of age.<sup>3</sup>

What are the symptoms of a cholera infection?

It can take between 12 hours and 5 days before an infected person starts showing symptoms. Most cases will have no or mild symptoms of vomiting and diarrhoea which can be successfully treated with oral rehydration solution. Even without symptoms, the bacteria remain in the stool for up to 10 days and can infect other people.

When the cholera bacteria penetrates the mucous layer of the small intestine it secretes a toxin. Some people react to this toxin with watery diarrhoea that looks like the water when you cook rice. This 'rice-water' can have a fishy odour. Patients will need rapid treatment with intravenous fluids. Antibiotics can diminish the duration and excretion of bacteria. In contrast to typhoid fever cholera is an acute diarrhoeal disease that can kill within hours due to dehydration and shock if left untreated.<sup>3</sup>

Cholera has been nicknamed the 'blue death' because a person's skin may turn blueish due to extreme loss of fluids.<sup>4</sup>

### Which vaccines can protect against a cholera infection?

To date, WHO has pre-qualified three oral cholera vaccines also abbreviated with OVC: Dukoral, Shanchol, and Euvichol-Plus.<sup>3</sup> All three vaccines require two oral doses to achieve full protection. Children require a third dose of Dukoral. The protective effect lasts for two years for Dukoral and three years for the other two oral cholera vaccines Shanchol and Euvichol-Plus.

Dukoral can be given to all individuals over 2 years of age. The vaccine contains a mixture of the dead bacteria cells and the toxin that they produce. Therefore, Dukoral stimulates the production of both anti-bacterial and anti-toxin antibodies. Cholera toxin is structurally and functionally similar to the toxin of Enterotoxigenic Escherichia coli (ETEC) so that Dukoral additionally provides some protection against ETEC infections. Due to this extra protective effect, Dukoral is mainly recommended for travellers. Two doses of Dukoral provide protection against cholera for 2 years. After four to six months it reaches an effectiveness of 85%, after two years the effectiveness is at 62%.<sup>3</sup>

### You mentioned two other vaccines: Shanchol and Euvichol-Plus. What can you tell us about them?

Shanchol and Euvichol-Plus have the same vaccine formula but are produced by different manufacturers. They contain killed cholera cells of the serotypes O1 and O139. These two vaccines do not contain parts of the cholera toxin. The two vaccines can be given to individuals over the age of one year. The effectiveness of a single dose is estimated at 80-85% over a 4-month period and in those aged 2–5 years, the level of protection against cholera is almost 100%. Therefore, children under 5 years of age who carry the highest risk in case of a cholera infection can really be very well protected by the vaccines Shanchol and Euvichol-Plus. There is a subsequent loss of effectiveness in the following years to about 67%.<sup>3</sup>

WHO recommends using oral cholera vaccines, and in particular Shanchol or Euvichol-Plus, in regions with endemic cholera, in humanitarian crises, and during cholera outbreaks. Both vaccines are currently available for mass vaccination campaigns through the Global oral cholera vaccine stockpile.<sup>5</sup>

### We usually learn from the media about cholera in the context of a humanitarian crisis, such as flooding after heavy rainfalls. It seems that public health specialists have to have cholera in mind when dealing with natural disasters. How can we prepare for such a situation?

Thanks for mentioning this very important point. Cholera outbreaks are often the consequence of another crisis. Health administrations and health facilities should reflect beforehand on potential situations that might lead to a cholera outbreak. The epidemic preparedness plan will then include a stock of ORS in the communities and a location for a treatment centre where patients can receive intravenous fluids and antibiotics. Zinc is an important adjunctive therapy for children under 5 years of age. It reduces the duration of diarrhoea. We also have to foresee a disruption of the supply of clean water. Therefore, we should also plan for water purification with pills or powders.

### Ok. Now we know how we can prepare our communities for a cholera outbreak. But how do we find out that we have a cholera problem?

Usually cholera cases are detected based on clinical suspicion. For confirmation, we have to test a stool sample for cholera bacteria. This can be done by using a rapid diagnostic test, in short RDT. There are about 20 RDTs on the global market. They differ in terms of quality and accuracy. There is a

job aid available on the use of RDTs from the Global Task Force in Cholera Control. We will share it on the website of the Difäm Health Community and via our WhatsApp groups. The Global Task Force in Cholera Control is a good source for all kinds of information on Cholera.<sup>6</sup>

After a suspected case has been tested positive on cholera using a RDT, a stool specimen should be sent to a laboratory to confirm the diagnosis and to do further analysis on the type of cholera bacteria and its susceptibility to antibiotic treatment. The laboratory will set up a bacteria culture or do a PCR test. Local capacity to diagnose and monitor cholera occurrence is vital to an effective surveillance system and for planning control measures. So, our preparedness plan should also include training for local health workers on cholera detection, testing and response.

We are almost at the end of our podcast. Are there any international initiatives that fight for an eradication of cholera?

Yes. There is the global strategy called 'Ending Cholera: a global roadmap to 2030'. It targets to reduce cholera deaths by 90% within this decade. The strategy includes a combination of surveillance, water, sanitation and hygiene interventions, social mobilisation, treatment, and the vaccination with oral cholera vaccines.<sup>5</sup>

Thank you very much xxx for this interesting information.

Let me recap the most important facts about cholera vaccination. Cholera is a bacterial infection caused by contaminated water. A cholera infection may cause mild symptoms but may also lead to death within hours due to watery diarrhoea and consecutive severe dehydration. Rehydration is therefore the main treatment option - either with ORS or by giving intravenous fluids.

We can protect ourselves against cholera by vaccination. There are three oral cholera vaccines at our disposal which are very effective, especially for children under five who carry the highest risk of death in case of a cholera infection.

We invite you to join us on our next podcast about vaccines.

Until then - Be blessed and stay safe

Internet sources as of 18.07.2022

1 [www.who.int/publications/i/item/whio-wer9313](http://www.who.int/publications/i/item/whio-wer9313)

2 [www.ncbi.nlm.nih.gov/pmc/articles/PMC1911442/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1911442/)

3 [www.who.int/publications/i/item/who-wer9234-477-500](http://www.who.int/publications/i/item/who-wer9234-477-500)

4 [www.ncbi.nlm.nih.gov/pmc/articles/PMC2171164/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2171164/)

5 [www.who.int/news-room/fact-sheets/detail/cholera](http://www.who.int/news-room/fact-sheets/detail/cholera)

6 <https://www.gtfcc.org/wp-content/uploads/2019/10/gtfcc-interim-use-of-cholera-rapid-diagnostic-tests.pdf>