

Podcast: Vaccines against typhoid fever

As of September 2022

My name is Joel, I am a member of the health team of the German Institute for Medical Mission, also called Difäm. With me is my colleague, Ute.

Today you will listen to a podcast about the immunization against typhoid fever which is transmitted by contaminated food and water and which can cause serious outbreaks.

Every year an estimated 11 to 20 million people get sick from typhoid fever and approximately 150.000 die. The majority of cases occur in South and South-East Asia as well as in sub-Saharan Africa.¹

Ute, can you please give us the most important facts on typhoid fever?

Typhoid is a so-called enteric fever caused by the bacteria salmonella Typhi. The bacteria can only live in humans, so typhoid fever is not transmitted by animals; it is transmitted by contaminated food or water. Therefore, typhoid fever is more frequent in countries with difficult access to clean water and sanitation. If you eat contaminated food, it takes the bacteria one week to one month to invade the gut and to reach the bloodstream. As soon as the bacteria have entered the blood stream, they can spread to every part of the body, causing sepsis.

Symptoms of typhoid fever include high continuous fever, fatigue, headache, nausea, abdominal pain, constipation or diarrhoea and confusion. The word typhus is Greek and means smoke or fog. The name refers to the delirious state a patient with typhoid fever can enter. Some patients may show a typical rash of rose coloured spots, usually around the navel.

If typhoid fever is caused by bacteria, can it be treated with antibiotics?

Yes, we can treat typhoid fever with antibiotics such as Ciprofloxacin or Ofloxacin. However, resistance to antibiotics causes more and more problems. If an infection with typhoid is not treated effectively with antibiotics, it can last weeks, even months and may lead to serious complications, like intestinal bleeding, perforation of the gut or even death. 1% to 4% of patients, who receive adequate therapy, die due to typhoid fever. This case fatality rate can rise to 10–20% in untreated cases or in cases resistant to the prescribed antibiotics.¹ Some people who went through a typhoid infection, can become chronic carriers who continuously shed bacteria.¹

Therefore, poor water and sanitation conditions are not the only challenge. In communities where typhoid fever is endemic and occurs frequently, are there chronic carriers who can infect people?

Yes. In approximately 2% to 5% of cases, the bacteria remain in the gallbladder and biliary ducts after the patient has survived typhoid fever. This can even occur if a patient has only mild symptoms which did not lead to treatment.¹

Vaccination against typhoid fever in endemic areas does not only help to prevent acute disease. It also reduces the number of chronic carriers of the typhus bacteria.

[Let us talk more about the vaccinations against typhoid fever. Are there other reasons for vaccination against typhoid fever?](#)

Increasing drug resistance of typhoid bacteria to antibiotics is a very strong reason for vaccination. This concerns fluoroquinolones and cephalosporins as well as azithromycin sporadically. Multidrug resistant (MDR) typhoid bacteria have caused large outbreaks of typhoid fever in Asia and Africa in recent years. Experience has shown that resistance rates can increase quickly: in Viet Nam, decreased susceptibility to fluoroquinolones rose from less than 5% to 80% within a few months. If we prevent typhoid fever through immunization and other measures, we will reduce the use of antibiotics and limit the emergence of resistant strains of typhoid bacteria.¹

[Why do we have this problem with resistant typhoid bacteria?](#)

It is difficult to diagnose typhoid fever correctly because it may be confused with a wide range of other common febrile illnesses. In most settings, we confirm the diagnosis through a blood or a stool culture. However, due to the lack of resources this is not done for the majority of cases in low and middle-income countries, and particularly not when infants and young children are concerned.¹ As a result, the patients are treated with antibiotics on suspicion, without sensitivity testing and sometimes not with the correct dose.

[Is a bacterial culture the only way of confirming a typhoid fever?](#)

No, there is also the Widal test, which is more than 100 years old. However, the Widal test produces fairly often false positive results because it also reacts to other infectious agents. Thus people are diagnosed with typhoid fever even though they suffer from something else. If they are then wrongly treated for typhoid fever, we start producing resistances.

Better tests are in development but they are not yet available on the market.

[Let me summarize: the correct diagnosis of typhoid fever is still a challenge and therefore treatment is frequently false. This creates multidrug resistant strains of bacteria, which are hard to handle. To prevent a typhoid infection seems to be a very good move in the right direction.](#)

This is correct. We have two possibilities to prevent typhoid infections. The first is to improve hygiene and the availability of clean water and sanitation, the second is to vaccinate children and adults in endemic regions. For the sake of maximum efficiency we should do both.

The best vaccines against typhoid fever are typhoid conjugate vaccines, in short TCV.⁶ They have an effectiveness between 79% to 85%, create an immunity that lasts for at least two years, and can be given to children from the age of 6 months. There are two products on the market, which are also supported by the Global Vaccine Alliance (GAVI). One is called Typhbar TCV, the other is called TYPHIBEV. Both are prequalified by the WHO. Only recently, Nepal has included TYPHIBEV into its routine immunization scheme for children.

These two vaccines will help to reduce the frequent use of antibiotics in typhoid treatment and thus, contribute to slow down the increase of antibiotic resistance in typhoid bacteria. What is even better: We finally have vaccines at our disposal for those most affected: the very young children.

[Thank you for ending the podcast on typhoid vaccination in such a positive vein. Let me quickly summarize what we have heard. Typhoid fever is a bacterial disease transmitted by contaminated food and water. The typhoid bacteria can cause large outbreaks that may kill quite a number of infected persons, mainly through a sepsis.](#)

[Certainly, preventive measures to improve hygiene, water quality and sanitation will be important to curb the prevalence of water- and food-borne diseases like typhoid fever. However, these measures](#)

require long-lasting infrastructural investments and will not be realised as quickly as necessary. In countries where typhoid fever is endemic, it will therefore be best to immunize children older than 6 months as well as adults who want better protection. Vaccination will reduce the number of typhoid cases and at the same time the number of chronic carriers of the bacteria who may then infect a big group of people without even knowing by cooking for them, for example.

Typhoid fever can be prevented by vaccination and new vaccines are now available that can be used even for those at highest risk: young children.

For outbreaks, global initiatives provide a stockpile of vaccines and support local authorities.

Thank you for listening to us. We invite you to join us for our next podcast on vaccines.

Until then - Be blessed and stay safe.

Internet sources as of 18.07.2022

- 1 www.who.int/publications/i/item/whio-wer9313
- 2 www.ncbi.nlm.nih.gov/pmc/articles/PMC1911442/
- 3 www.who.int/publications/i/item/who-wer9234-477-500
- 4 www.ncbi.nlm.nih.gov/pmc/articles/PMC2171164/
- 5 www.who.int/news-room/fact-sheets/detail/cholera
- 6 <https://www.coalitionagainststtyphoid.org/the-issues/typhoid-diagnostics/>