



CHOLERA

History

During the 19th century, cholera spread across the world from its original reservoir in the Ganges delta in India. Six subsequent pandemics killed millions of people across all continents. The current (seventh) pandemic started in South Asia in 1961, reached Africa in 1971 and the Americas in 1991. Cholera is now endemic in many countries.

Researchers have estimated that each year there are 1.3 to 4.0 million cases of cholera, and 21 000 to 143 000 deaths worldwide due to cholera.

The number of cholera cases reported to WHO has continued to be high over the last few years. During 2019, 923 037 cases, 1911 deaths were notified from 31 countries.

Vibrio cholerae strains

There are many serogroups of *V. cholerae*, but only two – O1 and O139 – cause outbreaks. *V. cholerae* O1 has caused all recent outbreaks. *V. cholerae* O139 – first identified in Bangladesh in 1992 – caused outbreaks in the past, but recently has only been identified in sporadic cases. It has never been identified outside Asia. There is no difference in the illness caused by the two serogroups.

The first outbreak of cholera El Tor was originally in Indonesia.

Epidemic cholera continues to occur in refugee camps and elsewhere in Africa. Cholera occurs rarely in the cooler months of the year. The disease being more common in persons with hypochlorhydria.

Cholera is an acute bacterial infection of the intestine caused by ingestion of food or water containing *Vibrio cholerae*, serogroups O1 or O139

Vibrio Cholerae 01 is a gram negative, there are more than 200 vibrio serogroups, only two biotypes 01 and 0139 causes epidemic. : 01 divided into Classical and El Tor, each of contains three serotypes – Inaba, Ogawa, and Hikojima.

Cholera can be life-threatening but it is easily prevented and treated.

Epidemiology, risk factors, and disease burden

Cholera can be endemic or epidemic. A cholera-endemic area is an area where confirmed cholera cases were detected during the last 3 years with evidence of local transmission (meaning the cases are not imported from elsewhere). A cholera outbreak/epidemic can occur in both endemic countries and in countries where cholera does not regularly occur.

In cholera endemic countries an outbreak can be seasonal or sporadic and represents a greater than expected number of cases.

In a country where cholera does not regularly occur, an outbreak is defined by the occurrence of at least 1 confirmed case of cholera with evidence of local transmission in an area where there is not usually cholera.

It is a disease of rapid onset characterized by fever, vomiting, rapid dehydration, profuse painless watery diarrhea with “rice water stool” and marked toxemia. In untreated cases in children hypoglycemia and renal failure and death.

Cholera is transmitted through asymptomatic carrier, contaminated food or unfiltered drinking-water, flies, as well as faecal-oral route. Risk factors include low Socioeconomic status and bottle fed, sanitary conditions in the environment play an important role, spread rapidly where living conditions are crowded and water sources unprotected and where there is no safe disposal of faeces.

The Reservoir is a sick person, a convalescent patient or carrier (through faeces or vomit). The El Tor biotype produces a higher carrier case ratio than that of the classical type. Also El Tor proved capable of extensive spread over much wider areas than classical.

Lab. Diagnosis:

Isolation of *V. Cholerae* from the faeces (shooting stars) or rectal swabs;

- Fluorescent- antibody technique.

- Gelatin agar method
- Microscope examination

Control

Individual:

- Early diagnosis, isolation, notification of cases.
- Oral rehydration (glucose – salt solution)

Sodium salt (3.5 mg)

Sodium bicarbonate (2.5 mg)

Potassium chloride (1.5 mg)

Glucose (dextrose) (20g)

- *Ringer Lactate in severe cases*
- Concurrent disinfection of stools, clothes.
- Antibiotics reduce the diarrheal period.
- For contacts: Doxycycline to close family contacts, and they should avoid consuming water and food belongs to patient.

Community:

- Sanitation and chlorination of water supplies; 1.3 parts per million.

- Fly-breeding sources eliminated.
- Disposal of Excreta.
- Food sanitation and all public swimming pools closed.
- Attention to ice production
- Boiling water

Vaccination: Currently there are three WHO pre-qualified oral cholera vaccines (OCV): Dukoral®, Shanchol™, and Euvichol-Plus®. All three vaccines require two doses for full protection. (Vaxchora), Live attenuated oral vaccine.

Dukoral, Killed vaccine

Management:

- Hospitalization for sever ill patient, strict isolation is not necessary.
- Less sever case outpatient with oral rehydration and antibiotics.
- Treatment: rehydration replacing volume fluid loss about 5 % of body weight over 4-6 hours in mild dehydration and

7% of body weight in moderate dehydration. For severe dehydration rapid I.V rehydration 100ml/kg.

- Concurrent disinfection of feces, and vomit
- Antibiotics shorten the duration of diarrhea. For adults give 300 mg of doxycycline and in resistance use azithromycin or ciprofloxacin.

Rapid access to treatment is essential during a cholera outbreak. Oral rehydration should be available in communities, in addition to larger treatment centres that can provide intravenous fluids and 24 hour care. With early and proper treatment, the case fatality rate should remain below 1%.

Zinc is an important adjunctive therapy for children under 5, which also reduces the duration of diarrhoea and may prevent future episodes of other causes of acute watery diarrhoea.

Breastfeeding should also be promoted.

Surveillance

Cholera surveillance should be part of an integrated disease surveillance system that includes feedback at the local level and information-sharing at the global level.

Cholera cases are detected based on clinical suspicion in patients who present with severe acute watery diarrhoea. The suspicion is then confirmed by identifying *V. cholerae* in stool samples from affected patients. Detection can be facilitated using rapid diagnostic tests (RDTs), where one or more positive samples triggers a cholera alert. The samples are sent to a laboratory for confirmation by culture or PCR. Local capacity to detect (diagnose) and monitor (collect, compile, and analyse data) cholera occurrence, is central to an effective surveillance system and to planning control measures.