

Causes, Symptoms, Prevention and Treatment of Cholera

By Anthony Wanjohi

1.0 Introduction

Cholera is an acute, diarrheal illness caused by infection of the intestine with the bacterium *Vibrio cholerae*. The infection is often mild or without symptoms, but sometimes can be severe. An acute water shortage in parts of eastern and northeastern Kenya is fuelling the spread of acute watery diarrhoea (AWD) and cholera, with deaths from new cases being reported. People are resorting to drinking water from anywhere because of the shortage. (IRIN, 2010). Kajiado District is such one District that suffers from water shortage especially during prolonged droughts. Thus, people often fall victim of this disease. No lasting measures have yet been put in place to curb the disease. The paper examines this disease based on the framework of its causes, signs and symptoms, diagnosis and prevention. Further the paper gives some demonstration on the disease to enlighten the community members more about it. Also to examine some preventive measures that can be undertaken to safeguard world cup visitors who may visit the place.

2.0 Causes, Symptoms, Diagnosis, Prevention and Treatment of Cholera

2.1 Causes and Transmission

Cholera is a severe diarrhea disease that is deadly without treatment. It is caused by poor hygiene and sanitation systems (World Health Organization, 2008). The disease is transmitted through water borne and food borne transmission.

Waterborne transmission: one can transmit the disease once he/ she consume water that is contaminated with feces from an infected person. This is common in areas with poor sewage systems and unclean drinking water. People infected with cholera suffer acute diarrhea. This liquid diarrhea, colloquially referred to as "rice-water stool," is loaded with bacteria that can

infect water used by other people (Ryan & Ray, 2004). The source of the contamination is typically other cholera patients when their untreated diarrhea discharge is allowed to get into waterways or into groundwater or drinking water supplies.

Food borne transmission: Also, consumption of cholera can be through drinking contaminated water or eating foods that have been washed with or made with contaminated water. Food borne transmission may also occur when an individual eats raw or undercooked shellfish. Any infected water and any foods washed in the water, as well as shellfish living in the affected waterway, can cause an infection. Cholera is rarely spread directly from person to person. *V. cholera* harbors naturally in the zooplankton of fresh, brackish, and salt water, attached primarily to their chitinous exoskeleton. (Kirn 2005).

Once the bacteria exit the stomach and reach the small intestine, they propel themselves through the thick mucus that lines the small intestine to get to the intestinal wall where they can thrive. *V. cholerae* bacteria. They then start up production of the hollow cylindrical protein flagellin to make flagella, the curly whip-like tails that they rotate to propel themselves through the mucus of the small intestine. After they reach the intestinal wall, the bacteria stops producing the protein flagellin. It therefore starts conserving energy and nutrients by changing the mix of proteins that they manufacture in response to the changed chemical surroundings. The toxic protein is the one that gives the infected person a watery diarrhea. This diarrhea carries the multiplying new generations of *V. cholerae* bacteria out into the drinking water of the next host if proper sanitation measures are not in place (Hartwell and Veres, 2004).

2.2 Symptoms

The primary symptoms of cholera:

- Profuse diarrhea sometimes called “rice water stools”
- Abdominal pain

Others may include:

- vomiting

- leg cramps

These symptoms start suddenly, usually one to five days after infection, and are the result of a toxin produced by the vibrio cholera bacterium that compels profuse amounts of fluid from the blood supply into the small and large intestines (Kindersley, 1989). An untreated cholera patient may produce several gallons of diarrheal fluid a day (Diamond, 1999). Due to this rapid loss of fluids, severe dehydration and shock can occur in these individuals. Shock occurs due to collapse of the circulatory system and if the fluid is not replaced, the patient may die within several hours.

Signs of dehydration include:

- loss of skin plasticity
- sunken eyes
- fast heartbeat
- low blood pressure
- Rapid weight loss

2.3 Diagnosis

In epidemic situations, a clinical diagnosis is made by taking a history of symptoms from the patient and by a brief examination only. People must begin treatment even before diagnostic work-up confirmation by laboratory analysis of specimens. Lab tests include stool gram stain (gram negative rods) culture, dark field microscopy or stool PCR. Stool and swab samples collected in the acute stage of the disease, before antibiotics have been administered, are the most useful specimens for laboratory diagnosis (Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera, 1999).

2.4 Prevention

A new oral vaccine, called Dukoral is available in other countries, but prophylactic usage is not currently recommended for routine use by the Centers for Disease Control and Prevention (CDC) because of incomplete protective effects (WHO, 2008). The CDC therefore recommends:

Sterilization: Proper disposal and treatment of all materials that come in contact with cholera patients should be sterilized by washing in hot water using chlorine bleach if possible.

Sewage: anti-bacterial treatment of general sewage by chlorine, ozone, ultra-violet light or other effective treatment before it enters the waterways or underground water supplies helps prevent undiagnosed patients from inadvertently spreading the disease.

Sources: Warnings about possible cholera contamination should be posted around contaminated water sources with directions on how to decontaminate the water (boiling, chlorination etc.) for possible use.

Water purification: All water used for drinking, washing, or cooking should be sterilized by boiling, chlorination, ozone water treatment, ultra-violet light sterilization, or anti-microbial filtration in any area where cholera may be present. Chlorination and boiling are often the least expensive and most effective means of halting transmission.

Sensitive surveillance: Surveillance systems can provide early alerts to outbreaks, therefore leading to coordinated response and assist in preparation of preparedness plans. Understanding the seasonality and location of outbreaks provide guidance for improving cholera control activities for the most vulnerable. According to (Bertranpetit & Calafell, 1996) this will also aid in the developing indicators for appropriate use of oral cholera vaccine.

2.5 Treatment

Because death from cholera is a consequence of dehydration, the disease is treated using oral rehydration therapy (ORT). ORT is highly effective, safe, and simple to administer. In situations where commercially produced ORT sachets are too expensive or difficult to obtain, alternative homemade solutions using various formulas of water, sugar, table salt, baking soda, and fruit offer less expensive methods of electrolyte repletion. Severe cases of cholera require intravenous fluid replacement. Antibiotics can shorten illness, but ORT is still necessary even when antibiotics are used. Tetracycline is typically used as the primary antibiotic, although some strains of *V. cholerae* have shown resistance. Other antibiotics that have been proven effective

against *V. cholerae* include cotrimoxazole, erythromycin, doxycycline, chloramphenicol, and furazolidone (Molson Medical Informatics, 2007). According to Krishna & Chandrasekhar (2006), Fluoroquinolones such as norfloxacin also may be used, but resistance has been reported. Use of anti-diarrheal medicines is not recommended since they prevent flushing of the bacteria out of the body.

3.0 Demonstration of Cholera Awareness Program in the School Community

3.1 Introduction

Sanitation and hygiene are key to community cholera prevention efforts. Members of community to know that they need to wash their hands each time before handling food, before eating and after visiting the toilet. These are the key messages (simple) which each member of the community need to know. However, a general program has various other parts including the causes, symptoms and even treatment for those affected.

3.2 Cholera Awareness Program

Table 1 shows Cholera Awareness and Prevention Program used with a school community at a school located in Kajiado District of Kenya.

Table 1: Cholera Awareness Program for Inchorroi Primary School in Kajiado

Activity	Objective	Methodology	Date/ Time	Place
Explaining the causes, symptoms, transmission, diagnosis, prevention and treatment of typhoid	To create awareness about hygiene among members of school community	Materials used: Charts of the causes and transmission process.	14/06/10	Inchorroi Primary School community
Discussion groups	To discuss on the prevention and treatment of Cholera	Group Discussion method	14/06/10	Inchorroi Primary School
Reporting	To report to the	Presentation	14/06/10	Inchorroi Primary

	rest of group members on the cholera prevention and treatment			School
Practical Approach	To demonstrate what is learnt	Practical method: Washing hands (with soap), and boiling food	Continuous process at school and at home	

4.0 Prevention/ Treatment of World Cup Visitors

4.1 Introduction

For World Cup Visitors, a number of measures should be taken to ensure that no one is infected by Cholera virus. We understand that a person may get cholera by drinking water or eating food contaminated with the cholera bacterium. In an epidemic, the source of the contamination is usually the feces (stool) of an infected person. The disease can spread rapidly in areas with inadequate treatment of sewage and drinking water. Since Kajiado District is one such district which is semi-arid and there is shortage of water, a number of measures should be taken to ensure that any visitor who may visit the district for cultural experience or even wild life tour is protected.

4.2 Preventive Measures

To prevent cholera from infecting the visitors, personal and general preventive measures should be taken. The following measures are essential:

When purchasing food: Do not buy food from unlicensed food premises or illegal hawkers; Pay attention to hygienic condition of shops and the holding temperature of food.

Food hygiene at home: Keep raw and cooked food separately. Defrost foods only when needed; Use separate utensils and equipment to handle raw food and cooked food to prevent cross contamination; Consume cooked food as soon as possible; Left-over food must be stored in a refrigerator at a temperature below 4 degrees Celsius and be reheated thoroughly before

consumption. Discard any food if spoilage is suspected; and Boil water thoroughly before drinking.

Personal hygiene: pay attention to personal hygiene. Wash hands thoroughly with soap, before eating, preparing food and after going to toilet.

Environmental hygiene: Keep kitchen clean; and Store refuse in a well-covered dustbin.

In case a visitor is infected, the following steps should be taken.

4.3 Treatment

Cholera is an easily treatable disease. In case one is infected, there should be prompt administration of oral rehydration salts to replace lost fluids. This nearly always results in cure. In especially severe cases, intravenous administration of fluids may be required to save the patient's life. Left untreated, however, cholera can kill quickly following the onset of symptoms. This can happen at a speed that has incited fear and paralyzed commerce throughout history. Thus medical interventions can also be taken in the nearest medical facility.

References

- World Health Organization (WHO) (2008): *Cholera* Retrieved May 22, 2010 from Available at: <http://www.who.int/topics/cholera/en/>
- Ryan, K & Ray, G (2004): *Sherri's Medical Microbiology*. McGraw Hill
- Kirn, T (2005): *A colonization factor links Vibrio cholerae environmental survival and human infection*.
- Hartwell, L & Veres, R (2004): *Genetics: From genes to genomes*. Boston: Mc-Graw Hill
- Kindersley, D (1989): *AMA Encyclopedia of Medicine*. Random House
- Diamond, J (1999): *Guns, Germs, and Steel*. Norton
- Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera, 1999: Atlanta

Bertranpetit J, & Calafell F (1996): *Genetic and geographical variability in cystic fibrosis*. Ciba Found Molson Medical Informatics, (2007): *Cholera treatment* Retrieved from:

<http://sprojects.mmi.mcgill.ca/tropmed/disease/chol/treatment.htm>

Krishna, B & Chandrasekhar, MR (2006): *Fluoroquinolone-resistant, Vibrio cholerae isolated during a cholera outbreak*. India

IRIN (2010). Water shortage increases cholera toll. Retrieved May 24, 2010 from <http://www.irinnews.org>

Suggested Citation in APA

Wanjohi, A.M. (2011). *Causes, Symptoms, Prevention and Treatment of Cholera*. KENPRO Publications. Available online at <http://www.kenpro.org/papers/causes-symptoms-prevention-and-treatment-of-cholera-at-community-level.htm>

Access PDF

[Click to access printer friendly pdf format](#)
