Portal of exit

the site from where micro-organisms leave

Upper respiratory tract

- saliva from the oral cavity
- sneezing
- coughing

Gastrointestinal tract

- faeces / diarrhoea from the bowel
- vomitus

Blood

- infected blood

Urogenital tract

- semen
- vaginal secretions
- infected urine

Skin and mucous membranes

- discharges from infected skin lesions and infected wounds

Cholera

Cholera is an acute diarrheal illness caused by infection of the intestine with the bacteria Vibrio cholerae.

https://www.mayoclinic.org/diseases-conditions/cholera/symptoms-causes/syc-20355287

V cholerae is

- comma-shaped,
- gram-negative aerobic or facultative anaerobic bacillus

The vibrios multiply in the lumen of the small intestine and produce an exotoxin (enterotoxin).

Vibrio cholera O1 and O139 are toxigenic and cause disease

Virulence and pathogenicity Or Pathophysiology of Cholera

Ingestion of V. cholerae

↓

Resistant to gastric acid

↓

Colonization in small intestine

↓

Secrete enterotoxin

↓

Enterotoxin binds to intestine cell receptor

↓

Activate adenyl ate cyclase

↓

Increase cAMP

↓

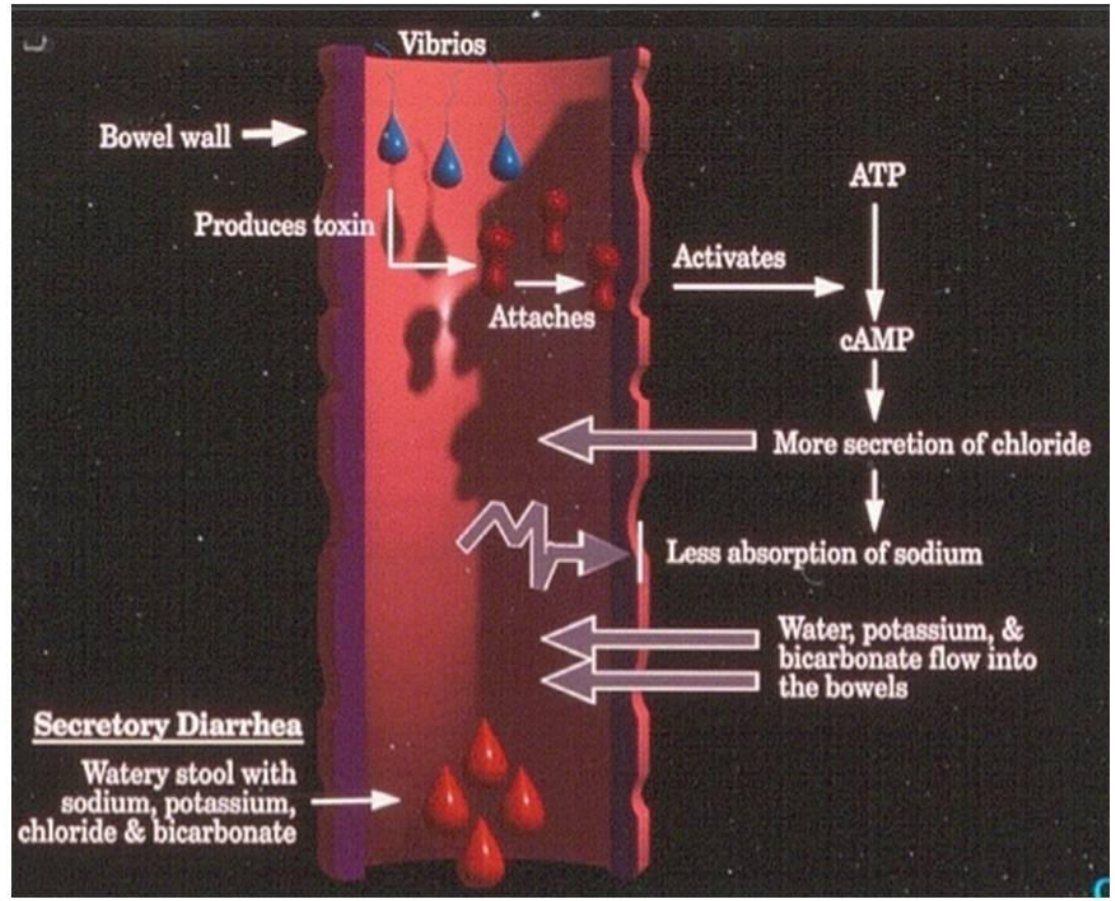
Activation of ion channels

↓

Release large quantities of electrolytes and bicarbonate into lumen

↓

Lead to watery diarrhea



Symptoms

The infection is often mild or without symptoms, but sometimes it can be severe

Watery diarrhoea

Profuse vomiting

Sever dehydration and even death if untreated

Source or reservoir

- The immediate source of infection are the stools and vomit of cases & carriers.

Entry port- gastrointestinal route

Incubation period to show the symptom is about few hours to 5 days, but commonly 1-2 days

Mode of transmission

A person may get cholera by drinking water or eating food that is contaminated with the cholera bacterium

The source of the contamination is usually the faeces of an infected person, or water contaminated with sewage

- Feacally contaminated water.
- Contaminated food and drinks
- Direct contact.

Susceptibility to V. cholera

Children more susceptible> adults

Less immune has higher risk> strong immunity

People with low gastric acid levels

Blood types: O>>B>A>AB

Lower socioeconomic group

Contaminated water and food , shellfish

Low standard of personal hygiene

Lack of education and poor quality of life

Diagnosis

Stool culture

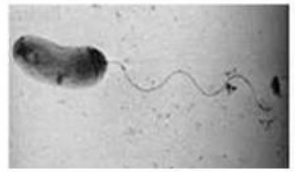
Confirm presence of cholera toxin

Cholera Rapid Test Dipsticks

LABORATORY DIAGNOSIS

Isolation and identification of *Vibrio cholerae*

- Dark field or phase contrast microscopy.
- Culture of stool specimen on selective thiosulfate-citrate-bile salts-sucrose (TCBS) agar plate.
- Yellow colonies is formed.

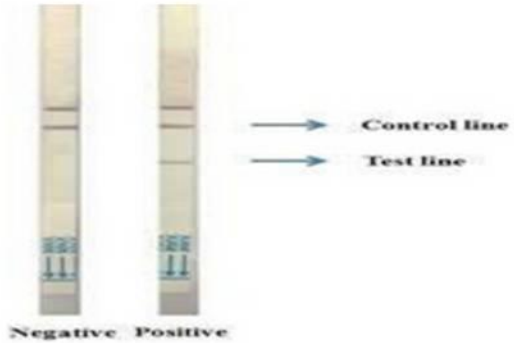


SE ROLOGICAL TESTS

- **Slide agglutination test :** Picking up suspected colonies and make suspension in 0.85 % sterile saline .
- Add one drop of polyvalent anti-cholera diagnostic serum.
- If agglutinin is positive , the test is repeated with Inaba and Ogawa antisera.

CHOLERA RAPID TEST

- In areas with limited or no laboratory testing, the Crystal® VC dipstick rapid test can provide an early warning to public health officials that an outbreak of cholera is occurring.
- However, the sensitivity and specificity of this test is not optimal.
- Therefore, it is recommended that fecal specimens that test positive for *V. cholerae* O1 and/or O139 by the Crystal® VC dipstick always be confirmed using traditional culture-based methods suitable for the isolation and identification of *V. cholerae*.



Prevention

Drink and use safe water/Eat safe food

Boil water, and bring it to a complete boil for at least 1 minute

Cook food well for at least 30 minutes, and covered, at 60 °C

Eat food hot, and peel fruits and vegetables

Wash your hands often with soap and safe water

Before you eat or prepare food

Before feeding your children

After using the latrine or toilet

After cleaning your child's bottom

After taking care of someone who has diarrhoea, touching them, their stools, vomit or clothes

Use latrines or bury faeces; do not defecate in any body of water

Use latrines or other sanitation facilitaties, to dispose of faeces

Keep the latrine clean

If no latrine is available, defecate at least 30 metres away from any source of water and then bury the faeces properly

Cholera vaccine called Vaxchora

Treatment

Rehydration and antimicrobial therapy

The goal of rehydration is to restore body's normal hydration status or replacing fluid loss

Patients can be treated with oral rehydration solution and/or intake of liquids in large amounts

Severe cases also require intravenous fluids

- Antibiotics should be administered to moderate or severe cases

Antimicrobial therapy is useful for

1. prompt eradication of the vibrio
2. diminish the duration of diarrhea
3. decrease the fluid loss.

Doxycycline, Azithromycin, Erythromycin, Ciprofloxacin

Zinc supplementation

- Zinc inhibits cAMP induced, chlorine dependent fluid secretion
- Zinc inhibits basolateral K+ channels
- Boosts the immune system
- Increases the absorption of water and electrolytes????