



Lecture 3

Cholera

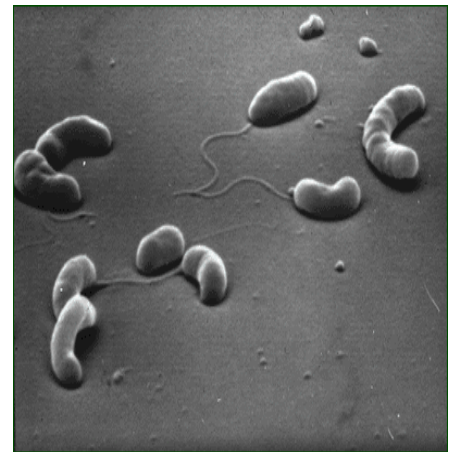
- Additional Notes
- Important
- Explanation
- Examples

Introduction

- A life-threatening secretory diarrhea induced by enterotoxin secreted by *V. cholerae*
- *V. cholerae* is not an invasive organism itself, although its toxin increases cAMP, increasing excretion of I^- > water follows the ions > severe diarrhea.
- Grows in salt and fresh water.
- It has over 150 serotypes, but there are **only 2 toxigenic types: O1 & O139.**
- Transmitted by fecal-oral route. (contaminated food and water)
- Common in India, Sub-Saharan Africa, Southern Asia.
- People with low gastric acid, more susceptible. (children more than adults).
- O blood type are at high risk than other blood groups.

Introduction

- Gram negative bacilli (comma-shape)
- Has a single polar flagellum.
- Time for incubation: 1-3 days.
- **Highly motile** due to the polar flagellum
- Urease and oxidase positive.
- Transmitted by fecal-oral route.

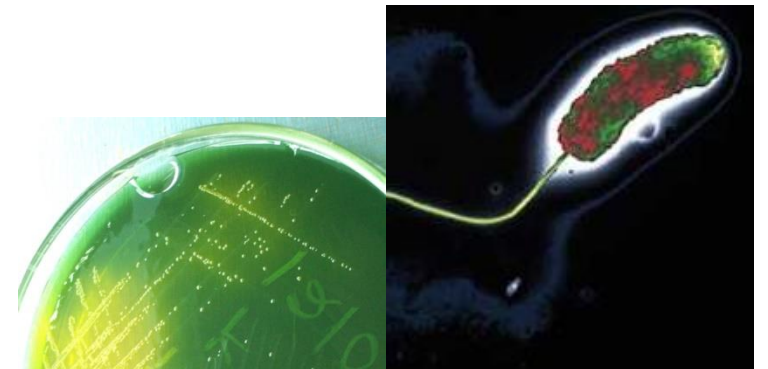


Symptoms and prognosis

- No abdominal pain.
- Severe diarrhea (1L/hour)
 - ✓ Intravascular volume depletion
 - ✓ Severe metabolic acidosis
 - ✓ Hypokalemia
- Decreased skin turgor
- Sunken eyes, cheeks
- Almost no urine production
- Without treatment death in 18 hours-several days
- More severe symptoms with cholera gravis.

Diagnosis

- Cholera should be suspected when patients present with **watery diarrhea**, severe dehydration
- No clinical manifestations help distinguish cholera from other causes of severe diarrhea.
- Based on clinical presentation and confirmed by isolation of vibrio cholera from stool.
- Laboratory diagnosis:
 - ✓ Visualization by **dark field or phase microscopy** (Look like “shooting stars”)
 - ✓ **Gram Stain:** Red, curved rods of bacteria
 - ✓ Grows on **TCBS agar**: showing large yellow colonies



Treatment

- The most important way for treatment is **rehydration**.
- Oral rehydration (replace the lost of water + electrolytes)
 - ✓ Used when less than 10% of bodyweight lost in dehydration
- Intravenous rehydration (replace the lost of water + electrolytes)
 - ✓ Used when the patient lost more than 10% of bodyweight in dehydration
 - ✓ Used when the patient unable to drink water due to vomiting
- Antibiotics:
 - ✓ Adjunct to oral rehydration
 - ✓ Reduce fluid loss by half
 - ✓ **Reduce recovery time by half**
 - ✓ 2-3 days instead of 4-6
 - ✓ **Tetracycline**, Doxycycline

Vaccinations

Killed whole-cell	Live-attenuated
Adult (50% protection for 6 months) Children (25% protection)	Adult (60% protection for 2 years) Children (protection declines after 6 months)
Need multiple doses	Induces mild cholera symptoms

Quiz

1. Which of the following is NOT correct about cholera?

- a) Gram -ve bacilli
- b) Oxidase +ve and urease -ve
- c) Has a single polar flagellum
- d) not invasive

2. Which of the following media is used to confirm diagnosis of cholera?

- a) TCBS agar
- b) Blood agar
- c) LJ agar
- d) Chocolate agar

3. What is the time for incubation:

- a) 1-3 days
- b) 2-5 days
- c) 3-8 days
- d) 18 hours – several hours