Cholera: Diagnosis and Treatment in Haiti

Vibrio cholerae

Cholera is an acute intestinal infection caused by toxigenic *Vibrio cholerae* O-group 1 or O-group 139. Many other serogroups of *Vibrio cholerae*, with or without the cholera toxin gene, can cause a cholera-like illness. Only toxigenic strains of serogroups O1 and O139 have caused widespread epidemics and are reportable to the World Health Organization (WHO) as "cholera." Cholera has not been detected in Haiti for many years.

Toxigenic *V. cholerae* O1 and O139 are free-living organisms found in fresh and brackish water often in association with zooplankton, shellfish, and aquatic plants. Cholera infections are most commonly acquired from drinking water in which *V. cholerae* is naturally found or into which it has been introduced from the feces of an infected person. Other vehicles include contaminated fish and shellfish, produce, or leftover cooked grains that have not been properly reheated. Person-to-person transmission is rarely documented, even during epidemics.

Clinical Features

Cholera infection is most often **asymptomatic** or causes a mild gastroenteritis. Severe cholera is characterized by acute, profuse **watery diarrhea** (described as **"rice-water stools"**) and vomiting, leading to volume depletion. Untreated, this can cause hypovolemic shock and death. Symptoms include tachycardia, loss of skin turgor, dry mucous membranes, hypotension, and thirst. Other symptoms, including muscle cramps, are secondary to the resulting electrolyte imbalances.

Laboratory Diagnosis

Culture: Cholera is confirmed through culture from stool or rectal swabs transported in Cary Blair medium at ambient to cool temperatures (NOT frozen). For isolation and identification, use a selective medium, such as thiosulfate–citrate–bile salts agar and confirm serologically with O1- or O139-specific antisera.

Rapid Tests: Rapid test kits are commercially available but do not yield an isolate for antimicrobial susceptibility testing or subtyping. Rapid test kits should not be used for routine diagnosis.

Treatment

Administer **Oral Rehydration Salts (ORS)** and, when necessary intravenous fluids and electrolytes, in a timely manner and in adequate volumes. This will reduce case–fatality rates to <1%. **Antibiotic therapy** will reduce fluid requirements and duration of illness and is indicated for severe cases. If possible, use antimicrobial susceptibility testing to inform treatment choices (special considerations for doxycycline and erythromycin testing, see http://www.who.int/drugresistance/publications/WHO_CDS_CSR_RMD_2003_6/en/).

WHO Fluid Replacement or Treatment Recommendations		
No dehydration	Oral rehydration salts	Children<2 years: 50–100 ml, up to 500 mL / day Children 2–9 years: 100–200 ml, up to 1000 mL / day Patients >9 years: As much as wanted, to 2000 mL / day
Some dehydration	Oral rehydration salts (amount in first 4 hours)	Infants<4 mos (<5 kg): 200–400 mL Infants 4–11 mos (5–7.9 kg): 400–600 mL Children 1–2 yrs (8–10.9 kg): 600–800 mL Children 2–4 yrs (11–15.9 kg): 800–1200 mL Children 5–14 yrs (16–29.9 kg): 1200–2200 mL Patients >14 yrs (30 kg or more): 2200–4000 mL
Severe dehydration	IV drips or Ringer Lactate or, if not available, normal saline **and** oral rehydration salts as outlined above	- Age <12 months: 30 mL/kg within 1 hour*, then 70 ml/kg over 5 hours -Age >1 year: 30 mL/kg within 30 min*, then 70 ml/kg over two-and-a-half hours

*Repeat once if radial pulse is still very weak or not detectable

- Reassess the patient every 1-2 hours and continue hydrating. If hydration is not improving, give the IV drip more rapidly. 200ml/kg or more may be needed during the first 24 hours of treatment
- After 6 hours (infants) or 3 hours (older patients), perform a full reassessment. Switch to ORS solution if hydration is improved and the patient can drink