



Reported Morbidity
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DEPARTMENT OF HEALTH AND HUMAN RESOURCES
OFFICE OF HEALTH SERVICES AND ENVIRONMENTAL QUALITY
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MONTHLY MORBIDITY REPORT

Provisional Statistics

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CHOLERA

BATON ROUGE, LA

Cholera has played an important role in the history of Louisiana. In 1832 - 33 over 6,000 people in New Orleans alone died from this disease. This was the bleakest year in New Orleans history. The population was 55,000 and more than one-seventh of the population died from yellow fever, cholera, and other causes in a 1 year period.¹ Over the next 40 years, several epidemics of cholera afflicted the population with each succeeding epidemic tending to be less virulent than the previous ones. The dual horrors of yellow fever and cholera were the impetus behind the formation of the State Board of Health by the Louisiana Legislature in 1855.²

Although the 7th World Cholera Pandemic started in Asia in 1961, the United States has been spared. From 1911 until 1978 there was only one naturally acquired case of cholera in the continental United States. This occurred in Port Lavaca, Texas in 1973. No source was ever discovered for that case.

On August 13, 1978, an Abbeville resident was admitted to the hospital with severe watery diarrhea. The hospital laboratory observed the strange occurrence of a pure culture of hemolytic colonies from a stool culture. An interested laboratory technologist continued to pursue the identification of the organism and through biochemical reaction it was determined that the bacteria was a *Vibrio*. The culture was sent to the state laboratory where it was further identified as a *V. cholerae* and forwarded to the National Center for Disease Control (CDC) for typing. The CDC confirmed the isolate as *Vibrio cholerae* O-1, Biotype El Tor, Serotype Inaba. Since mid-August, a total of 11 *Vibrio cholerae* infections have been identified, 7 in Vermilion Parish and 4 in Lafayette Parish.

CHARACTERISTICS OF PATIENTS:

Three persons were totally asymptomatic and were only discovered through routine rectal swab cultures of case contacts. Five of the 11 patients were hospitalized. Six were male and 5 were females. Ages of patients ranged from 12 to 69. Duration of diarrhea was approximately 2 to 7 days. All patients have recovered and none are in the hospital at the present time. The hospitalized patients were ill at home for 2 - 4 days before being admitted to the hospital. All of the hospitalized patients were severely dehydrated on admission and one was admitted in critical condition without obtainable blood pressure. This patient subsequently developed acute renal tubular necrosis

secondary to prolonged hypotension. She required 1 week of dialysis before discharge home.

The one common denominator in the histories of these patients was that they had all eaten crabs 2 - 5 days prior to becoming ill. The crabs were for the most part obtained privately from Louisiana waters stretching from Mud Lake west of Cameron to Vermilion Bay. The crabs were either boiled or steamed. In some cases the cooking times and temperatures were inadequate to kill the cholera bacteria. In other cases cooking appeared to be adequate but the crabs were re-contaminated by being placed back in the original storage containers and maintained up to 6 hours unrefrigerated before consumption.

SURVEILLANCE:

From the time of appearance of the first case of cholera, an extensive surveillance effort was set in motion by state and local health department personnel in cooperation with a team of investigators from the National Center for Disease Control in Atlanta, Georgia.

A) Patient Investigation: Each case was questioned in great detail and all close contacts had rectal swabs done and serum drawn for vibriocidal antibody testing. Generally there was good agreement between serology testing and rectal swabs. Immigration from Asian countries into Vermilion Parish was reviewed, and since there had been no immigration since April, 1978, it was felt that the possibility of recent immigrants introducing cholera was extremely remote. Also there had been no recent cases of diarrhea in foreigners admitted to local hospitals in Vermilion Parish.

B) Sewage Surveillance: Swabs were placed in town sewage systems throughout Southcentral and Southwestern Louisiana. This surveillance is continuing at regular intervals and the only positive samples have been in towns where known patients reside. Every positive sewage swab could be explained by a patient (except in Gueydan) and these positive sewage systems quickly became negative on repeat testing. From this information it appeared that our sewage surveillance was quite specific and that cholera was occurring only as sporadic cases and was not a widespread phenomenon.

C) Water Samples: Municipal water systems were tested

throughout Southern Louisiana and have been found negative for fecal contamination and cholera.

D) Environmental Sampling: Water and live seafood samples were taken from all implicated Louisiana coastal waters. From hundreds of samples of live crabs, oysters, and shrimp, only 1 positive sample of shrimp was found. Some patients had leftover seafood. These samples were cultured and only one refrigerated crab was positive for cholera. Swabs were placed in coastal and inland waterways suspected of carrying cholera. Only one swab was positive in the old Intracoastal Canal between Vermilion Bay and White Lake in Vermilion Parish.

E) Serologic Survey: A random sample of Abbeville residents was done. One hundred and five samples were obtained. Eight had titers of 1:160 or greater and of the eight 3 had titers of 1:320 or greater. Supposedly, an elevated vibriocidal antibody titer would be evidence for a recent cholera infection. However, although highly sensitive, this test is not specific. It can also be positive with prior infections with *Brucella*, *Citrobacter* and other organisms, and this limits its usefulness as an indication of exposure to cholera.

F) Lab Experiments with Cholera: Crabs were placed overnight in cholera-infected water in the lab. The next day they were cooked. Boiling for up to 8 minutes did not kill the cholera organisms but at 8 minutes of boiling the crabs were red and the meat was firm. This points out the inadequacy of using these criteria to determine how long crabs should be cooked. Ten minutes or more of full boiling did kill the cholera bacteria in the samples. Non-pressure steaming of crabs for up to 30 minutes did not kill the organisms. Freezing infected crabs will lower the number of organisms but will not eliminate cholera from infected samples.

CHARACTERISTICS OF CHOLERA:

Classically it is taught that cholera presents as a severe dehydrating diarrhea. Cholera, however, can present as a spectrum from asymptomatic to mild to life-threatening disease. It has been estimated that with cholera caused by the El Tor biotype 75% of cases are asymptomatic and only 2% have severe diarrhea. The other 23% have mild to moderate diarrhea. Text books state that the incubation period can be as long as 5 - 7 days but in almost all cases the incubation period is from several hours to 3 days.³ Mucus in the stool imparts the characteristic "rice-water" appearance. Although there are no absolute diagnostic features of cholera, some criteria are helpful. Vomiting is often present but usually occurs after onset of diarrhea, which is the reverse of staphylococcal food poisoning where vomiting precedes diarrhea. High fever and severe abdominal pain are uncommon in cholera but often are prominent features of salmonellosis, shigella, and amebic dysentery. Painful muscle cramps in cholera are probably secondary to electrolyte imbalance. Again, it must be stressed that the severe "rice-water" diarrhea of "cholera

gravis" leading to hypotension, electrolyte imbalance, and death is only the tip of the iceberg. In endemic areas, cholera should be considered in the differential diagnosis of any mild non-specific diarrheal illness.

Cholera is not easily spread person-to-person probably because of the large inoculum necessary to cause disease. Vibrios will not survive when dried and therefore inanimate objects are not important in transmission. Flies may transport vibrios physically from excreta to food but since human excrement is generally treated or deposited underground and food kept in screened areas, flies are not felt to be an important means of transmission except in very poor sanitation areas.

Most patients eliminate the vibrio organisms within a few days if treated with antibiotics and within 1 - 2 weeks if untreated. There have been isolated reports of protracted vibrio excretion and even of one long-term carrier, Cholera Dolores.⁴ However, these reports identify what is felt to be an extremely rare phenomenon.

Vibrios are inactivated at acid pH and those who have had their gastric acidity barrier modified or eliminated by gastric surgery or antacid therapy seem to be particularly susceptible to cholera infection. Also lab animals who have had their normal intestinal flora altered by broad-spectrum antibiotics have been shown to be more susceptible to cholera.

TREATMENT:

"Cholera gravis," the severe dehydrating form of cholera, is a medical emergency. Appropriate fluid management is the cornerstone of therapy and should be instituted immediately. Cholera diarrhea is generally isotonic containing about 135 meq/l of Na⁺, 13 meq/l of K⁺, 105 meq/l of Cl⁻, and 45 meq/l of HCO₃⁻. The best single IV replacement fluid is Ringer's lactate with 10 - 15 meq KCl supplementation. Normal Saline (0.9%) with 1 amp of bicarbonate per liter and 10 - 15 meq KCl/l can also be used.⁵ IV fluids should be given in quantities sufficient to replace the fluid that the patient has lost through vomiting and diarrhea. Fluid requirements may be enormous, with some patients requiring over 20 liters in 24 hours. Electrolytes should be followed carefully, and if the patient appears acidotic, arterial pH should be monitored if available. Antibiotics shorten the duration of diarrhea and the period of excretion of vibrios. Tetracycline is the drug of choice given in doses of 250 mg orally every 6 hours for 5 days. This should be started when vomiting subsides. Furazolidone is preferable for children and pregnant women. Parenteral antibiotic treatment is unnecessary and may actually be dangerous. Parenteral cephalosporins and aminoglycosides can accentuate renal insufficiency in patients with severe dehydration. Kaopectate, antispasmodics, and other anti-diarrheal agents are of no known value in treating cholera. In children with cholera, physicians should be alert to the possibility of severe hypoglycemia which can present as convulsions or coma.

It is unnecessary and undesirable to use stringent isolation protocols for cholera patients. Close personal

contacts of cholera patients are not in jeopardy if simple handwashing and careful disposition of the patients' excreta are enforced. No masks, gowns, or physical isolation is warranted.

RECOMMENDATIONS AND PLANS:

1) Surveillance of sewage, water, and live seafood (oysters, crabs, shrimp) will be continued indefinitely. All 48 commercial establishments that process crabs will have raw and cooked crabs sampled as well as the effluent from the washings of the crabs.

2) Crabs are safe to eat if handled and cooked properly. Recommendations for the handling and cooking of crabs are as follows: Crabs should be boiled for a full 15 minutes. This 15 minute period should begin not when the crabs are put in the boiling water but after the water they have been put into comes to a rapid boil again. Cooked crabs should not be placed back into the containers in which they were originally stored before cooking. Utensils used in handling cooked crabs should be kept separate and not used for raw crabs. Steaming of crabs is not recommended at the present time. These recommendations have been forwarded to all seafood restaurants in southern Louisiana.

3) The State Central Lab in New Orleans and its two regional labs in Lake Charles and Lafayette and 5 other hospitals in southern Louisiana have begun routine plating of stool and rectal swabs from all diarrheal illnesses on thiosulfate-citrate-bile salt agar (TCBS). This medium is specific for vibrios (cholera and non-cholera vibrios). Since we have had cases of Vibrio cholerae and Vibrio parahaemolyticus this year in Louisiana, we recommend that every hospital in southern Louisiana obtain TCBS and routinely plate on this medium all stools submitted for routine culture. If colonies grow out on the TCBS, the specimens can be submitted to the Regional or State Health Department labs. Specific tests can be done on these colonies to determine if the vibrios isolated are truly V. cholerae or one of several non-pathogenic strains of vibrio.

4) Cholera Vaccination: Vermilion and Lafayette parishes are temporarily defined as cholera-infected areas by the World Health Organization. Travelers from these parishes will be able to visit Europe, Mexico, and most other major tourist centers without cholera shots;

however, the following countries will require cholera shots from travelers from these parishes: Albania, Angola, Brunei, Cape Verde, China (Taiwan and People's Republic), Egypt, Fiji, Iran, Iraq, Laos, Libyan Arab Republic, Madagascar, Mali, Nauru, Pakistan, Panama, Pitcairn Island, Qatar, Ryukyu Islands, Saint Helena, Seychelles, Swaziland, Yemen, and Zambia. Five countries that always require cholera vaccination from all travelers are Malawi, Maldives, Mozambique, Papua New Guinea, and Saudi Arabia.⁶ It is not recommended that cholera shots be given indiscriminately to all travelers. Under the most favorable circumstances, the vaccine is only 50 - 60% effective and then only for a few months. Also there are mild to moderate side effects of the shots. Almost all recipients develop a sore arm and some develop constitutional symptoms, e.g., malaise, generalized aches, and slight fever lasting 24 to 48 hours, sometimes severe enough to require absence from work.

DISCUSSION:

It is still unclear how the implicated crabs became infected with cholera bacteria. It is known that different types of vibrios e.g. parahaemolyticus are common inhabitants of our coastal waters and it is possible that cholera has been with us a long time and only recognized now because it was fortuitously tested for. Crabs were obtained from several different widely spaced fishing areas and it is hard to imagine a single common source contaminating all the areas. We may have a few more isolated cases but we do not expect a major outbreak. Cholera is not propagated in areas where there is safe drinking water and sewage disposal is adequate. As long as these are maintained in proper condition, it is extremely unlikely that we will be faced with a major public health threat from cholera.

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SELECTED REPORTABLE DISEASES

(By Place of Residence)

STATE AND PARISH TOTALS	ASEPTIC MENINGITIS	DIPHTHERIA	ENCEPHALITIS	ENCEPHALITIS, POST INFECTION	HEPATITIS A AND UNSPECIFIED	HEPATITIS B	TUBERCULOSIS, PULMONARY	MENINGOCOCCAL INFECTIONS	PERTUSSIS	RABIES IN ANIMALS	RUBELLA*	SEVERE UNDERNUTRITION	SHIGELLOSIS	TYPHOID FEVER	OTHER SALMONELLOSIS	TETANUS	MEASLES	GONORRHEA	SYPHILIS, PRIMARY AND SECONDARY
Reported Morbidity September, 1978																			
TOTAL TO DATE 1977	15	0	8	0	475	116	435	124	6	21	27	4	102	0	103	1	74	14058	539
TOTAL TO DATE 1978	79	0	9	1	554	167	394	114	4	12	489	9	87	3	99	1	343	16893	552
TOTAL THIS MONTH	7	0	2	0	58	23	44	3	0	0	3	0	9	0	9	0	2	1931	76
ACADIA					1		1								1			25	
ALLEN																		9	
ASCENSION																		2	
ASSUMPTION																		2	
AVOYELLES																		2	2
BEAUREGARD					1		2											8	
BIENVILLE						1	1						1					3	
BOSSIER						1	2				1				2			11	
CADDO	1				2	2	2						4		1			242	2
CALCASIEU	1						4											113	
CALDWELL																		5	
CAMERON																		2	
CATAHOULA																			
CLAIBORNE																		10	
CONCORDIA					1	1												5	
DESOTO																		7	
EAST BATON ROUGE			1		1		3	1							1			143	11
EAST CARROLL																		1	
EAST FELICIANA																		2	
EVANGELINE																			
FRANKLIN																		1	
GRANT						2												3	1
IBERIA																			
IBERVILLE								1										24	
JACKSON																			
JEFFERSON	2				19	2	6				2		1				2	96	4
JEFFERSON DAVIS																		5	
LAFAYETTE																		35	2
LAFOURCHE						1	1											20	
LASALLE																			
LINCOLN																		17	
LIVINGSTON																		6	
MADISON					6										2			6	1
MOREHOUSE																		11	
NATCHITOCHES			1										2						4
ORLEANS	1				18	8	14	1										709	17
OUACHITA					1													63	4
PLAQUEMINES																		3	
POINTE COUPEE																		3	1
RAPIDES					1													121	12
RED RIVER																		1	
RICHLAND																		6	1
SABINE																		10	
ST. BERNARD					1													4	
ST. CHARLES																		6	
ST. HELENA																		5	1
ST. JAMES																		10	
ST. JOHN																		6	2
ST. LANDRY	1				1	1												5	
ST. MARTIN						2												6	2
ST. MARY					1	1	1											16	
ST. TAMMANY													1					25	5
TANGIPAHOA					2		1												
TENSAS																		13	
TERREBONNE					2	1	2											11	2
UNION																		3	
VERMILION																		45	
VERNON	1						1											5	2
WASHINGTON							2											21	
WEBSTER							1											16	
WEST BATON ROUGE																		1	
WEST CARROLL																		1	
WEST FELICIANA																			
WINN															1			1	
OUT OF STATE															1				

* Includes Rubella, Congenital Syndrome

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From January 1 through September 30, the following cases were also reported: 1-Brucellosis; 3-Malaria (contracted outside the U.S.A.); 2-Psittacosis; 3-Leptospirosis; 1-Rocky Mountain Spotted Fever; 1-Histoplasmosis; 9-Cholera.