

Cholera control on Guam, 2000

Abstract: During April, 2000, the island of Pohnpei began experiencing an outbreak of cholera and during June and July of the same year four cases of cholera representing 3 separate introduction events were identified on Guam. Two of these events were associated with eating reef fish imported from Pohnpei. Following the imposition of a narrowly-focused ban on the importation of inshore seafood and processed food products from Pohnpei, no additional local or imported cases of cholera were detected on Guam.

Robert L. Haddock*
Luong T. Truong**
Tomas S.N. Aguon***

Introduction

The first outbreak of cholera to be recognized in the Pacific during the 7th pandemic of this disease occurred on the island of Guam in 1974¹. Subsequently the Guam Department of Public Health and Social Services recommended that medical laboratories on Guam begin routinely testing all diarrhea stool specimens using TCBS *Vibrio*-selective media. Adoption of this practice soon revealed that *Vibrio parahaemolyticus* was the most commonly identified cause of food poisoning on Guam and that *V. cholerae* was being introduced to the island on a regular, if not frequent, basis².

In April of 2000 an epidemic of *V. cholerae* began in the island State of Pohnpei, Federated States of Micronesia. By July 1, 1,733 confirmed or suspect cases had been reported³. Although there is substantial movement of people and some importation of food stuffs from Pohnpei

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to Guam, it was believed that the availability of safe water supply and sewage disposal on Guam made the island unreceptive to cholera epidemics and no special control measures were instituted other than alerting health providers to be alert for possible cholera cases.

Patients

Patient 1: On Sunday, June 25, 2000, a 34 year-old male Pohnpei resident businessman flew to Guam with his family and registered at a Tumon Bay hotel. On Tuesday, June 27, he developed severe diarrhea and vomiting and was transported to the Guam Memorial Hospital Emergency Department (GMHED) by ambulance. He was given IV fluids and, after a stool sample was collected, an antibiotic (ciprofloxacin). The patient was discharged the same day. Two days later the GMH laboratory reported isolating O1 *V. cholerae* from the patient's stool specimen and he was recalled to the GMHED for consultation. Although still weak, the patient reported that he felt much improved and that no other family members had become ill. Although he could not recall eating any seafood recently, during the last minute rush to prepare for his trip to Guam he had eaten at a fast food snack bar on Pohnpei.

Patient 2: On Saturday, June 24, a 24 year-old female Pohnpeian resident of Guam purchased Red Snapper fish from a local market that specializes in importing fish from Pohnpei. The next evening (June 25) a relative (patient 3) barbecued 3 of the fish, shared one fish with Case 2 and gave 2 of the fish to other relatives. On the evening of June 25 patient 2 began having watery diarrhea but opted for self medication. On June 26 she began vomiting as well but continued to self medicate. On July 1 she was brought to the GMHED by ambulance and was hospitalized, primarily because she was 3 months pregnant. Other family members, including a 2½ year old daughter, are reported to have remained well.

Patient 3: On July 5 a 30 year-old female Pohnpeian resident of Guam was seen in the GMHED complaining of persistent watery diarrhea and a stool specimen was

*Epidemiologist, Office of Epidemiology and Research, Department of Public Health and Social Services, Guam.

Luong T. Truong, CDC Investigator I, Communicable Disease Control Section, Department of Public Health and Social Services, Guam. *Tomas S.N. Aguon, Public Health Inspector II, Division of Environmental Health, Department of Public Health and Social Services, Guam. Contact: Robert Haddock, Office of Epidemiology and Research, Department of Public Health and Social Services, P.O. Box 2816, Hagåtña, GU 96932, USA. Fax: (671) 734-2066 E-mail: robhad@mail.gov.gu

Table 1. Outbreaks of O1 *Vibrio cholerae* El Tor observed on Guam, 1974 - 2000

No.	Date	Ethnicity	Cases ¹	Serotype	Probable Source
1.	Jul 1974	Filipino	2/6	Ogawa	Local raw fish (Mañahak)
2.	Jul 1977	Filipino	1/6	Inaba	Oysters from Philippines
3.	Nov 1981	Chamorro	1/4	Inaba	Unknown (no travel)
4.	Oct 1982	Filipino	2/2	Ogawa	Local raw fish
5.	Aug 1983	Chuukese	1/1	Inaba	Travel to Chuuk
6.	Apr 1985	US tourist	1/1	Inaba	Travel to Thailand
7.	Aug 1985	Chamorro/Filipino	1/5	Ogawa	Local raw fish
8.	Aug 1985	Chamorro	1/1	Ogawa	Local raw fish (Tíao) ²
9.	Oct 1985	Chamorro	1/1	Ogawa	Fish from Philippines
10.	Nov 1985	Chamorro	1/1	Ogawa	Crab from Philippines
11.	Jul 1986	Filipino	1/5	Ogawa	Travel to Philippines
12.	Jul 1986	Filipino	1/1	Ogawa	Fish from Philippines
13.	Oct 1987	Filipino	1/1	Ogawa	Travel to Philippines
14.	Dec 1987	US tourist	1/1	Ogawa	Travel to Philippines
15.	Jun 1988	Chamorro	1/1	Ogawa	Travel to Philippines
16.	Aug 1990	Filipino	1/1	Ogawa	Crab from Philippines
17.	Apr 1994	Filipino	1/1	Ogawa	Unknown (no travel)
18.	Jan 1996	Palauan	1/1	Ogawa	Tuna sashimi (local?) ³
19.	Sep 1998	Filipino	1/1	Ogawa	Travel to Philippines
20.	Dec 1998	Filipino	1/1	Ogawa	Unknown (no travel)
21.	Jun 2000	Pohnpeian	1/1	Ogawa	Travel to Pohnpei
22.	Jul 2000	Pohnpeian	2/2+	Ogawa	Fish from Pohnpei
23.	Jul 2000	Pohnpeian	1/1	Ogawa	Fish from Pohnpei

1. Confirmed cases/Total cases

2. O1 *V. cholerae* Ogawa was isolated from frozen "left-over" fish.

3. Tuna was obtained from a friend working on a commercial fishing vessel, location where the fish was caught is unknown

collected. A relative of the patient previously described, she had cooked and eaten a fish with Patient 2 on the evening of June 25. At noon the next day she cooked 3 additional fish, gave 2 to other relatives and stored the lone remaining fish inside her microwave (unrefrigerated) to be consumed by herself that evening at 6:00 pm. Patient 3 began having diarrhea on July 1. She believes that her illness was due to drinking sakau prepared at the same store from which the fish had been purchased. She was hospitalized on July 5 and discharged on July 9. This case should probably be included with Patient 2 as a single incident.

Patient 4: On July 5 an 18 year-old female Pohnpeian resident of Guam was seen in the GMHED complaining of persistent watery diarrhea since July 1. A stool specimen was collected but she was not hospitalized. On June 24 she and other members of her family had eaten fish brought to Guam from Pohnpei by a friend. She claims none of the others became ill and she attributes her illness to a party she attended on July 1 where she ate typical fiesta fare (fried chicken, rice, salad, soft drink). She could not recall eating any fish at the party.

Results

Isolates from patient stools of all 4 patients were initially identified as *Vibrio cholerae* by the GMH Laboratory and confirmed as O1 *V. cholerae* biotype **Ogawa** by the Guam Public Health Laboratory. The Centers for Disease Control and Prevention, Atlanta, subsequently confirmed all isolates as toxigenic O1 *V. cholerae* **El Tor Ogawa**.

Discussion

If the illnesses of patients 2 and 3 are considered related, these cases represent the 21st, 22nd and 23rd outbreaks of O1 *V. cholerae* **El Tor** recognized on Guam since 1974 (see Table 1). Most of these incidents have involved but a single case; in none were secondary (on-island transmission) cases identified. Four of these incidents have been associated with the consumption of fish caught on Guam, 9 have been associated with imported seafood (oysters, 1; crab, 2; fish, 6) and 8 have been associated with travel (Thailand, 1; Chuuk, 1; Pohnpei, 1; Philippines, 5). In 3 instances no probable source of infection could be determined.

Following the identification of these cholera cases, Guam public health officials instituted a temporary prohibition on the importation of seafood and processed food products from Pohnpei and the neighboring State of Chuuk (seafood in transit to another destination and unprocessed agricultural products were exempted). This action was taken in view of the history of cholera outbreaks on Guam associated with food products, a recent outbreak of *V. parahaemolyticus* and *V. alginolyticus* illness on the island of Saipan associated with seafood imported from Pohnpei, the possibility that the outbreak of cholera on Pohnpei was introduced from Chuuk which had previously experienced cholera outbreaks, and information that inshore waters of both Pohnpei and Chuuk might be contaminated as a result of inadequate or malfunctioning sewage disposal systems during recent heavy rainfall. The restrictions on importations from Chuuk were rescinded when Guam was informed that no cases of cholera were occurring on Chuuk and it was determined that the cholera biotype occurring on Pohnpei was different from the biotype that had occurred on Chuuk previously (Inaba). After reviewing World Health Organization recommendations for cholera control⁴, the restriction on importation of food products from Pohnpei was modified to permit the importation of any processed food products which had been manufactured under the supervision of a health agency. In April, 2001, all restric-

tions on the importation of processed or unprocessed food products to Guam from Pohnpei were rescinded after Guam health authorities were notified that Pohnpei had been declared cholera-free.

Conclusions

No additional cases of *V. cholerae* infection were identified on Guam as of September, 2001. It is possible that this is due, at least in part, to the imposition of focused restrictions on the importation of food items which were implicated by epidemiologic studies in the earlier introductions of cholera to Guam.

References

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In a heirarchy, every employee tends to rise
to his level of incompetence.

DR. L.J. Peter (1919-)