Micronesica 26(1): 35–38, 1993

Guam Seaweed Poisoning: Food Histories

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Abstract—Interviews with all known victims of an apparent outbreak of foodborne intoxication showed that the only food eaten by all affected persons was a locally collected seaweed, *Gracilaria tsudai*. In each case the seaweed had been purchased from the same retail source; no persons who had eaten this species of seaweed purchased from other sources or collected by family members are known to have been ill.

At approximately 5:00 a.m. on Sunday, April 28, 1991, I was notified by Dr. O. Cruz that 5 patients with suspected ciguatera fish poisoning were being treated at Guam Memorial Hospital and that all those affected claimed to have eaten seaweed purchased at a local flea market the previous day. Since this market would be open again early Sunday morning, I contacted the administrator of the Division of Environmental Health and requested that he have an inspector dispatched to the incriminated market to confiscate existing supplies of the seaweed and to instruct the vendors to not sell additional seaweed until authorized to do so by the health department.

Two more affected persons reported to the hospital Emergency Room while the investigation was in progress. I later determined that two other victims who did not require hospitalization were treated by private practitioners and that an additional 4 persons who were minimally affected did not seek any medical care (a total of 13 persons representing 6 different households are therefore known to have been affected).

I was initially skeptical that this incident could have been caused by eating seaweed since I had never heard of a similar incident and the hospital Poison Control Center was unable to find any reference to seaweed poisoning. The results of my investigation, however, indicate that the victims of this incident were indeed correct in attributing their illness to seaweed.

While it soon became evident that this was a common-source food poisoning outbreak, it was a little unusual in that the food item common to all cases had been eaten in a number of different households. This resulted in a great number of different foods having been eaten by the victims and necessitated reinterviewing informants several times to ascertain which food items might be common to all cases. Food histories collected from all those affected (or a family spokesperson in the case of those who were incapacitated) confirmed the initial impression that the only food item that all affected persons had eaten was a locally harvested

Table 1. Summary of Guam seaweed poisoning incident, 1991

House-hold	Patient	Registration at Emer-gency Rm. (if any)	Age	Sex	Amount Eaten	Time Eaten	Symptoms Onset	Presenting Symptoms	Treatment Source	Outcome
1	A.U.	1718 4/27/91	33	M	1 forkful	1200 4/27	1645 4/27	Paresthesia, diarrhea × 5, "blood" in urine, "rain on skin"	Inpatient GMH	OK
	R.M.	2220 4/27/91	32	F	1 cereal bowlful	1230 4/27	1430 4/27	Vomiting, diarrhea, numbness & shaking of feet, muscle spasms	Inpatient GMH	Died 4/30/91
	C.G.		8	F	2–3 pieces spit-out	1230 4/27		None (did not swallow)	None	OK
	T.G.		14	F	1 or 2 pieces	1230 4/27	0700 4/28	Diarrhea × 1	None	OK
	D.D.		31	F	1 piece	1230 4/27		None	None	OK
2	F.E.	2127 4/27/91	36	F	Salad plateful	1330 4/27	1830 4/27	Pin-prick, "rain on skin", weakness, cramps, cold sweats	ER only	OK
	E.F.		71	M	4 spoonfuls	1330 4/27	1830 4/27	Diarrhea only	Private MD	OK
	R.F.		48	F	Couple of spoonfuls	1330 4/27	2200 4/27	Numbness, "rain on skin," diarrhea, aching jaws	Private MD	OK
	J.E.		37	M	1 spoonful	1330 4/27		None	None	OK

Table 1. Continued

3	A.E.	0958 4/28/91	61	F	Handful	1300 4/27	1630 4/27	Perioral & extremity paresthesia, body shakes when walking	Inpatient GMH	OK
	C.E.	1643 4/28/91	72	M	Handful	1300 4/27	1630 4/27	Diarrhea, numbness of fingers and toes	ER only	OK
4	S.T.*	0505 4/28/91	48	M	Bowlful	1830 4/27	0200 4/28	Numbness of feet & hands, abdominal cramps, diarrhea, muscle spasms	Inpatient GMH	Died 5/08/91
5	C.S.	1650 4/27/91	33	F	Plateful	1130 4/27	1530 4/27	Numbness, cold sweats, difficulty walking, muscle spasms	Inpatient GMH	Died 4/28/91
	M.R.		60	F	2–3 tablespoons	1130 4/27	1530 4/27	Diarrhea, cold sweats	None	OK
	H.S.		11	F	2–3 tablespoons	1130 4/27	1530 4/27	Diarrhea × 2	None	OK
6	T.C.		50	F	1 teaspoon	1200 4/27		None	None	OK
	V.C.		46	M	2 tablespoons	1200 4/27		None	None	OK
	I.C.		44	F	1 tablespoon	1200 4/27		None	None	OK
	S.U.		28	M	2 tablespoons	1130 4/27	1330 4/27	Diarrhea × 1, numbness of fingertips lasted approx. 12 hrs	None	OK

*This individual ate at household #3 after showing occupants how to prepare seaweed "correctly" by blanching.
GMH = Guam Memorial Hospital
ER = Emergency Room, GMH

seaweed, *Gracilaria tsudai*. Although two vendors selling this alga at the same market had harvested it at different times on the same day and in the same area, all affected persons had eaten seaweed purchased from only one of them.

General aspects of this outbreak have been reported previously (Haddock & Cruz 1991, Halstead & Haddock 1992); more detailed information is provided in Table 1. The effects of the seaweed were clearly dose-related; those who had eaten the most seaweed were the most seriously affected. Three of 4 patients that ate amounts of seaweed described as a "bowlful" or "plateful" eventually expired. The average incubation period of all those affected was 4.63 hrs; the association between length of incubation period and amount of seaweed eaten was not statistically significant.

On the basis of the amount of seaweed claimed to have been sold by the vendor, either additional persons ate the seaweed without ill effect or some customers heard about the poisoning incident and disposed of their purchases before consuming them.

Acknowledgement

The assistance of J. Malilay in conducting interviews of patients and their families is gratefully acknowledged.

References

Haddock, R. L. & O. L. T. Cruz 1991. Foodborne intoxication associated with seaweed. Lancet July 20; 338: 195–196.

Halstead, B. W. & R. L. Haddock 1992. A fatal outbreak of poisoning from the ingestion of red seaweed *Gracilaria tsudai* in Guam—A review of the oral marine biotoxicity problem. J. Natural Toxins 1: 87–115.