Department of Health
REPUBLIC OF CHINA

25 March 1991/Vol. 7/No. 3

Epidemiology Bulletin

A Botulism Outbreak in Miaoli Country

On the 26 of December 1990, the Bureau of Food Sanitation of the Department of Health was notified by the 7th Section of the Miaoli Country Health Bureau that five aborigines of Tai-an Township had been hospitalized with suspected symptoms of botulism intoxication. A group of investigators from the Department was dispatched on the 27 of December with antitoxins. A field epidemiological investigation began in Mei-yuan village with the assistance of Dr. Hsieh of the Tai-an Health Station.

The investigation revealed that a collective outbreak of suspected botulism intoxication occurred at noon and in the afternoon of the 18 of December 1990 after the consumption of some home-made foods by some villagers.

On the 18 of December 1990, villagers helped a family in harvesting and were later treated the to lunch by the family 10 people ate at noon, 5 in the afternoon, three family members of villagers shared the food they brought home, and one villager ate the food on the 15 of December; a total of 19 persons who ate the food at one time or another. On the 19 of December, some villagers developed symptoms of abdominal bursting, nausea and dryness of mouth and were subsequently treated for flu. Botulism intoxication was later suspected after they had developed the symptoms of blurred vision, dysphagia and diplopia. The 19 villagers had the following major symptoms: dryness of mouth, dysphagia, nausea and blurred vision (see Table 1). The definition of patient in the analysis with EPI-INFO computer is one who has dryness of mouth and dysphagia or diplopia or blurred vision. 11 of them met this criteria. The incubation period was calculated from the time of consumption of the home-made food; the median incubation period was 21 hours (see Figure 1). 7 were hospitalized, one in Chang-Gung Memorial Hospital of Lin-Kou, 6 in the Taipei Veterans' General hospital. Five were treated with antitoxin. The hostess was under an artificial respirator for 14 days. Serum and fecal specimens of six patients were sent to the National Institute of Preventive Medicine for laboratory tests three seum specimens were positive for type B botulinal toxin, though no botulinus bacillus was found in the six fecal specimens. All patients were eventually discharged well; the four with minor symptoms who were not hospitalized recovered soon.

Altogether 15 items of foods were prepared by the hostess. The consumption and attack rate by food item are shown in Table 2. When morbidity rates of consumers and

Table 1. Symptoms of Botulism Intoxicated Patients

Symptom	No. of cases	%
Dryness of mouth	12	63
Dysphagia	10	53
Nausea	10	53
Lassitude	10	53
Dysarthria	9	47
Blurred vision	9	47
Abdonimal bursting	9	47
Ptosis	8	42
Triedness	8	42
Dysphonia	8	42
Constipation	8	42
Vomiting	8	42
Diplopia	7	37
Retention of urine	7	37
Headache	7	37
Difficulty in walking	6	32
Dizziness	6	32
Dyspnea	5	26
Weakness of lower limbs	4	21
Diarrhea	4	21
Sore thorat	4	21
Weakness of upper limbs	3	16
Abdominal pain	2	11
Abnormal feeling	2	11
Muscle pain	1	5

non-consumers by food items are compared, the consumption of salted bird's meat is found to be highly significant ($p < 0.05$).

Though some specimens of salted meat had been collected for testings, they were not the left-overs of the day, and no botulinus bacillus was found.

Laboratory tests were administered to six of the seven patients. The findings were:

1. nerve's conduction velocity: all normal;
2. electromyogram: all normal;
3. pulmonary function test: minor and moderate restricated abnormality in three of the six patients;
4. esophagus transmission time: delayed transmission in three of the four patients;
5. Schimer's test for tears secretion: abnormality in five of the six patients.

Figure 1. Incubation Period of A Botulism Outbreak in Miaoli County

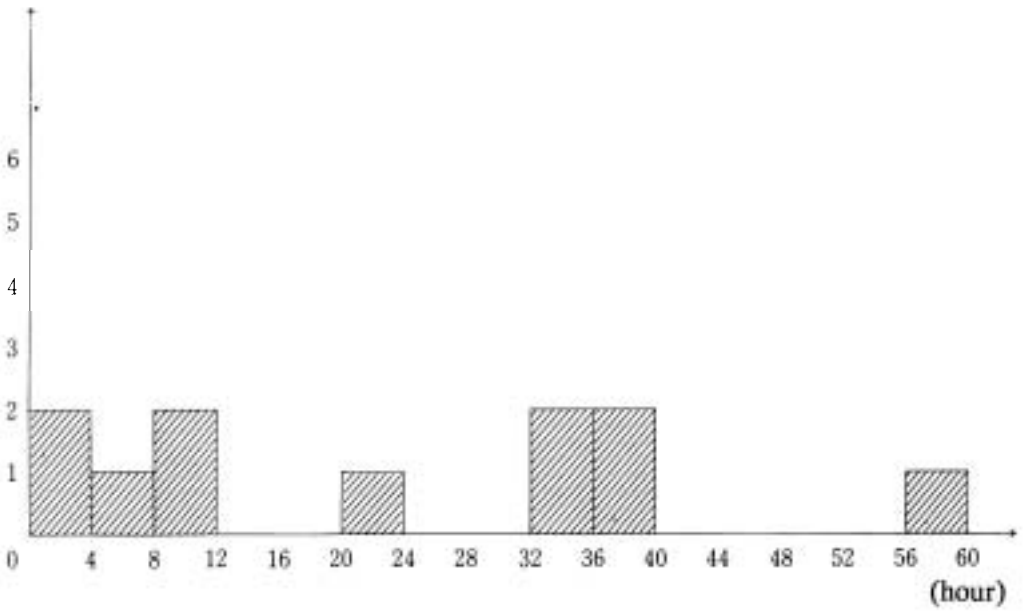

Table 2. Consumption of Foods and Attack Rate by Food

	Ingested			Not ingested			
	No. ill	No. not ill	Attack Rate (%)	No. ill	No. not ill	Attack Rate (%)	P value*
Salted fish	5	3	63	6	5	55	0.55
Salted bird's meat	10	3	77	1	5	17	0.02**
Salted flying fox meat	5	2	71	6	6	50	0.34
Bioled pork	3	4	43	7	4	64	0.35
Bioled chicken	4	1	80	7	7	50	0.27
Stir-fried flying fox meat	4	3	57	7	5	58	0.66
Pan-fried fish	3	1	75	8	7	53	0.43
Stir-fied bean cake	1	1	50	9	7	56	0.71
Rice	6	4	60	5	4	56	0.61
Salted pork	1	0	100	10	8	56	0.58
Rive wine	2	3	40	9	5	64	0.34
Drink 1	2	1	67	8	7	53	0.59
Drink 2	6	2	75	5	6	45	0.21
Drink 3	1	1	50	10	7	59	0.68
Cabbage soup	1	3	25	6	4	50	0.28

*Fisher's Exact Test, one-tailed P-value

**$p < 0.05$, salted fish, salted bird's meat and salted flying fox meat were prepared separately.

Editorial note: Botulism intoxication comes in three ways: from foods, from wounds and infant intoxication. Intoxication by food is caused by the ingestion of food contaminated by toxin produced by botulinus bacillus in food. Wounds contaminated by the toxin of botulinus baccilus may also cause botulism intoxication.

Honey contaminated by spores of botulinus bacillus, when ingested by infant, may produce toxin in the intesttines. The microbes in the intestines of infant are not yet developed, the ingestion of contaminated honey may also cause botulism intoxication.

The 13 botulism outbreaks reported in Portugal between 1970 and 1984 were all caused by inadequately prepared home-made foods: 9 from smoked ham, one from sausage, and two from sea foods.

8 case in the present outbreak were found to be due to type B botulinal toxin. The literatures reveals that intoxication due to fish is often related to type E botulinal toxin. Most foods look normal in appearance and taste normal. Consumers are often intoxicated without prior knowledge.

The suspected perserved bird's meat in the present outbreak was prepared in the following way: the bird's meat after boiling, had salt added and then was placed in an air-tight plastic container, and added cooked rice was added two days later. More salt was added if the meat was not salty enough, it was then placed in the plastic container again. The meat is served 5-6 days later.

If the meat was contaminated by botulinus bacillus in the process of preparation and the salt content is not higher than 10%, botulinus bacillus is likely to produce toxin under anaerobic conditions in an air-tight plastic container. When such food is consumed, intoxication is bound to occur. The consumption of home-preserved meats is common among certain aboriginal groups. Health station staff should educate the public about the danger of eating home-preserved meats unless cooked over 100 ° C for 10 minutes.

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Acknowledgement: Thanks are due to Dr P.C. Chung of the Taipei Veterans' General Hospital for providing the findings of the laboratory tests.

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