

## **Investigation of a Botulism Incident Involving a Group of Indigenous People Living in Renai Township, Nantou County**

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### **Prelude**

It was June 5, 2006, when people at the Third Branch of Taiwan CDC (located in Taichung City) received a case notification from Nantou County Health Bureau regarding two adult indigenous residents of Renai Township, Nantou County, who appeared to have symptoms including blurred vision, double vision, and difficulty swallowing. This official notification stressed that the symptoms were quite serious but the source and cause were not clear. It seemed necessary to conduct an epidemiological outbreak investigation in order to understand the cause of the disease and the scale of the outbreak, and to determine the route of infection to prevent further disease spread.

### **Outbreak investigation**

After a small team assembled and sent out by Nantou County Health Bureau carried out an on-site outbreak investigation between May 26 and 30, which

focused on the family members, neighbors, relatives, and contacts of the two subjects of the notification, the investigation discovered three other indigenous residents displaying similar symptoms. Altogether, the group consisted of a father and son with the surname Chang, a mother and son from a Lin family, and a young man with Yeh as his last name. Their ages ranged between 23 to 64 years old, and all of them were well-acquainted neighbors or relatives. Among them, the senior Mr. Chang first appeared to have symptoms such as difficulty swallowing, blurred vision, constipation, stomach distention, and difficulty urinating, and thus he was named the index case of the incident by definition (the first person showing symptoms). Later in the evening on the same day when the index case had his onset of symptoms one of his close-by neighbors Mrs. Lin also found herself feeling difficult to swallow. She and the index case went to see doctors and were hospitalized on May 27 and 31 respectively. The rest three intoxicated individuals all started to have some relatively lighter symptoms on May 30, and none of them bothered to see a doctor. According to the disease onset dates of the S individuals on an epidemiological curve of this incident (see Figure 1), it is estimated the incubation period of this disease was somewhere between 12 hrs and 6 days. The principal symptoms of the illness, starting from the most commonly experienced by the patients, were difficulty swallowing (100%), blurring vision (80%) and dry throat (80%). The hospitalized index case and Mrs. Lin eventually recovered and were released by the hospital on July 9 and June 14 respectively.

### **Study on the infection source**

Our attention focused on the various food items consumed by the 5 patients before the onset of symptoms, which included some marinated goat meat, flying squirrel meat, canned beer, Paolyta B (a popular brand of medicated alcoholic beverage), and cooked white rice. We found that the marinated goat meat was the

one and only food item that was shared and consumed by all 5 persons affected in this incident, while the others were each consumed by 1 to 4 people in the group. Therefore, as far as the inquiry went, it was quite obvious the goat meat dish should have something to do with this outbreak. This delicacy happened to be a present given to the index case by his sister-in-law..

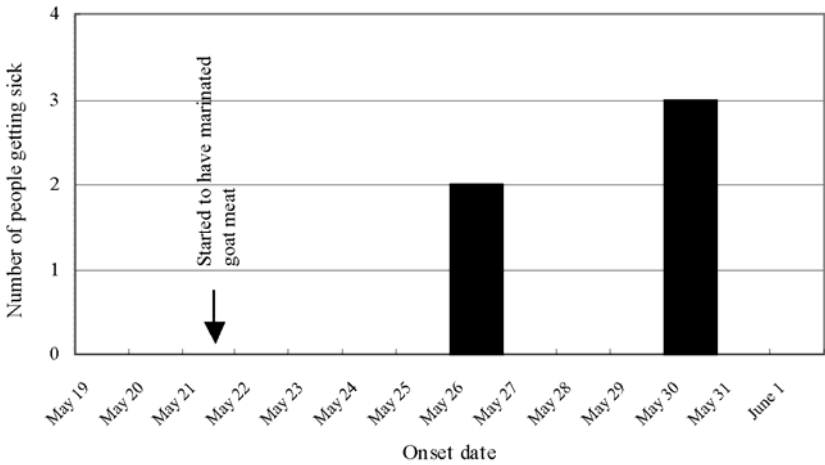
### **Specimen collection and laboratory diagnosis**

From the patients of this clustering infection event, we collected 4 serum samples, 4 rectal swabs, and 1 stool sample, and they were rushed over to the laboratory- at the Research and Diagnostic Center of Taiwan CDC in Taipei City. The laboratory conducted two test routines on each of those specimens, i.e. cultivation and isolation of *Clostridium botulinum*, and toxin neutralization test (using an animal model). However, all results turned out to be negative. In spite of that, the local health bureau investigation team somehow managed to get hold of some leftovers of the goat meat dish and sent it to the Bureau of Food and Drug Analysis (also in Taipei City) for test, and the result was *Clostridium botulinum* type B positive.

### **Conclusion**

This clustering event had a total of 5 people falling sick, and they were all quite intimate to one another as close relatives or next-door neighbors. When we considered the time lag between the moment they consumed the marinated goat meat and the onset of symptoms (such as blurred vision, double vision, and difficulty swallowing), we found it characteristic of botulism. The botulinum toxin is one of the most poisonous neurotoxins in existence. Having entered human body, the toxin will rapidly react with the presynaptic terminals of cholinergic nerves to which it becomes fixed. In this particular incident, human body specimens were collected on the 11th day after the onset of intoxication symptoms, which meant the botulinum toxin had entered the patients' body for quite a long while, and most of the toxin in the blood had already been fixed, In

other words, very little amount of free toxin remained in the blood at that stage, which might well explain why none of the human body specimens gave positive results when (lie laboratory looked for botulinal toxin in them. Another consideration worth mentioning was that once (lie Health Bureau received the disease notification from the hospital, the attending physicians in fact noticed that the situations of the two inpatients were getting better, so they did not bother to use antitoxin in the treatment. This would certainly rule out the possibility that the negative results might conic from the intervention of antitoxin. Nevertheless, although we could not obtain any direc evidence in the human specimens collected and assayed, toxin of Clostridium botulinium type B was detected in the dish leftovers, which enabled us to deduce that this incident was most likely a food poisoning ease, with the marinated goat meat dish as the source food, and Clostridium botulinium type B happened to be the illness-causing microorganism.



**Figure 1. An Epidemiology diagram for the recent botulism incident involving a group of indigenous residents living in Renal Rural Area, Nantou County**