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– Contents –

Scombroid Poisoning in An Electronic Company — Kaohsiung City

Scombroid Poisoning in An Electronic Company in the Kaohsiung Export Processing Zone

1. Summary

Few scombroid poisoning cases have been reported in Taiwan The last one was an outbreak in a department store in Kaohsiung City in July 1986. The present outbreak occurred in an electronic factory in the Kaohsiung Export Processing Zone on 8 August 1987 resulting in 28 cases with headache, dizziness, and flushing The incubation period ranged from 0.5 to 3.8 hours with a median of 1.9 hours Of them, 15 were sent by the factory to hospitals for anti-histamine treatment to relieve the symptoms, the rest seven sought for medical care by themselves. The agent of the poisoning was the Scomberapeinocephalus bleaker served int he cafeteria of the factory on 8 August The food after testing was found to contain 318.2 mg/g of histamine. Inadequate transportation and storage of the fish were considered the major reasons.

2. Introduction

The Bureau of Disease Control of the Department of Health learned from the newspapers on 11 August 1987 that a food poisoning outbreak occurred on 8 August in a factory in the Kaohsiung Export Processing Zone with 15 cases being sent to hospitals for treatment. After informing the Bureau of Food Sanitation of the Department, a team was sent on the same day for investigation.

3. Background

The electronic factory is a Japanese-invested factory located in the Kaohsiung Export Processing Zone producing electronic parts for exporting The factory employs around 1,000 workers, of them, 913 are on day shift working in three departments. Lunch hours are 11:30, 12, and 12.30 at the cafeteria The cafeteria is operated by a company on contract basis.

4. Method

After a briefing at the Kaohsiung City Health Department, the team visited the factory to collect information on the workers and the foods supplied on the day Medical records of the 15 cases were also reviewed. A questionnaire containing information on the name, sex, and age of worker,

department, lunch hour, foods consumed and quantity, symptoms if any and when, number of symptoms, whether treated and when recovered was prepared and printed 105 copies for distribution to the 15 cases and to 30 each from each department selected by random number table. The cafeteria was also visited to learn about the operation, the process of lunching, the sources of foodstuffs, etc. Suspected foods were traced of their sources and the process of treatment Food samples collected by the workers and kept in the refrigerator were tested Returned questionnaries were treated by SPSSPC

5. Findings

A journalist reported that the factory had a record of poisoning due to chemical exposure, the Kaohsiung City Health Department suspected initially the outbreak to be poisoning due to occupational chemical exposure This suspicion was cleared immediately on the following grounds:

1) Preliminary information showed that cases were distributed in two departments. Poisoning due to occupational chemical exposure is unlikely to occur simultaneously in two departments
2) The attack rate of occupational disease is generally high In the present outbreak, even in the same department, many were not affected
3) Cases of chemical poisoning usually do not recover in a short period of time. Cases of the present outbreak recovered relatively quickly after the anti-histamine treatment in hospitals

All 105 questionnaires were retrieved. The expected number of cases was calculated to be 146.5 as follows:

First department:	(262 - 6)	×	4/30	=	34 13
Second department:	(297 - 9)	×	4/30	=	38.40
Third department	(354 - 0)	×	5/30	=	59.0
					131 53

131.53 + 15 = 146 53 (persons)

Hence, the incidence of food poisoning among workers who took lunch in the cafeteria is 0 16 (146.53/913) 36 of those interviewed had some felt symptoms including headache, vertigo or dizziness, flusing, nausea, abdominal cramping, vomiting, pruritis, and diarrhea. If a person with two or more of the above symptoms is considered poisoned, 28 persons met the definition Frequencies of symptoms were headache (98.6%), vertigo or dizziness (60 7%), flushing (57 1%), nausea (39.3%), abdominal cramping (28.6%), vomiting (17 9%), pruritis (17 9%), and diarrhea (14 3%) The median of the incubation period was 1 9 hours ranging from 0 5 to 3 8 hours 22 had been treated and recovered soon after While inspecting the factory, it was found that the kitchen and the dining room were not separate The sanitary conditions of the dining room were fair Of the foods supplied on 8 August, a statistical corelation was found between the scomberapeinocephalus bleaker and the red-stewed chicken The chicken was, however, found to be negatively related to the incident, the fry fish, therefore, was considred the agent of poisoning. Further investigation discovered that the fish was caught near the Pen-chia-yu island on the early morning of 7 August, salted and iced, and brought to Su-au port around noon-time of 7 August It was then placed in polyethylene case with ice, transported to Taipei and other cities, and to the Chien-chen market of Kaohsiung City in the early morning of 8 August. It was sold to wholesaler Wong, and at six

o'clock of the morning, to retailer Tang Retailer Tang removed the fish from the polyethylene case, processed it under room temperature at 8 am, kept it under room temperature thereafter, and sent it to the cafeteria at 10 30 am, where it was processed and fried at 11 am A piece of the fish saved by the workers of the factory and kept in the refrigerator was sent to the National Laboratoriès of Foods and Drugs of the Department of Health for teating It was found to contain 3,182 ppm of histamine A check with the Central Weather Bureau found that the average temperature on 7 August was 28 1°C in Su-au and 30°C for the Kao-hsiung area on 8 August.

6. Discussion and Recommendations

Scombroid poisoning occurs a few minutes or one to two hours after the consumption of inadequately handled tuna, skipper, mackerel, and Mahi-mahi fishes with symptoms similar to histamine poisoning The outlook is similar to allergy and yet different in the following three aspects·

1) In scombroid poisoning many persons, and almost every one who has eaten the fish, develop symptoms simultaneously This is rare in the allergy to fish

2) Cases of scombroid poisoning will recall that no symptoms ever developed in the previous experiences with the fish Cases of allergy to fish will either have no such recall or will state that they have had similar symptoms previously with the same fish

3) The residual of food will show excess amount of histamine in testing

Poisoning of this type occurs in fishes not kept in low temperature after catch Microbes in fish such as Proteus morganii, E coli, Lledsiella pneumonia, Enterobacter aerogenes, Proteus mirabili, Vibrio alginlyticus, etc will then produce sufficient amount of Histidine decarboxylane to decompose histamine into histamine and other poteniators such as Putresin and Cadaverine Manoamine or Diamines of histamine are resistant to heat, they will not become ineffective even after frying. In the present incident, the fish was iced only once after being unloaded at the Su-au port, and the polyethylene case was too thin (1-1 5 cm) During the journey from Su-au to Kaohsiung, the fish was not stored in refrigerator van, the high temperature of 30°C on 7 August would facilitate the growth of bacteria to decompose Histidine into Hiatamine Later, the retailer had kept the fish under room temperature (around 30°C) until it was delivered to the cafeteria More Histamine would have been produced Health authorities should, therefore, have more strict control over the transportation and storage of foods

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