

# An outbreak of ciguatera fish poisoning in Victoria

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## Abstract

**An outbreak of ciguatera fish poisoning in outer Melbourne in September 1997 was traced to a 16.2 kg Maori Wrasse fish imported into Victoria from Trunk Reef in Queensland. The outbreak involved 46 individuals attending a banquet at an Asian restaurant at which four different dishes prepared from the flesh and viscera of the fish were offered. In all 30 individuals consumed at least one of these dishes and all reported one or more symptoms, in the main gastrointestinal and/or in 18 cases neurological. Seventeen cases were seen in four different hospitals and nine were treated with parenteral mannitol therapy. Nine of 18 cases were still symptomatic 10 weeks after the episode. Education of Asian restaurateurs and the wider community about the risks of ciguatera fish poisoning was undertaken. *Commun Dis Intell* 2000;24:344-346.**

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## Introduction

Ciguatera fish poisoning is caused by the consumption of fish contaminated by naturally occurring toxins produced by the algal dinoflagellate *Gambierdiscus toxicus* associated with coral reefs. Ciguatera fish poisoning is widespread, affecting mainly tropical and sub-tropical areas of the world.<sup>1</sup> Most reported outbreaks in Australia have involved Spanish mackerel, but numerous other species of fish, including red bass, the chinaman and coral trout, have been implicated.<sup>1,2</sup>

The outbreaks are generally restricted to certain areas around the coastline of the Northern Territory and Queensland where 175 outbreaks involving 527 people were reported between 1965 and 1984.<sup>1</sup> However with increasing popularity of fresh reef fish (and their export to other States) cases of ciguatera fish poisoning can present anywhere in Australia.

On 16 September 1997, following a report of a suspected case seen at the Emergency Department of a Melbourne hospital, the Infectious Diseases Unit, Department of Human Services, Victoria, commenced investigations into a suspected outbreak of ciguatera fish poisoning. The same day a general practitioner also reported seeing three patients with symptoms consistent with ciguatera poisoning. Both doctors advised that their patients had been part of a large group that had eaten at an Asian restaurant in the eastern suburbs of Melbourne the day before. Initial information was that approximately 18 of 36 people had become ill after eating fish as part of a banquet meal.

## Methods

A case was defined as a person who, having eaten the suspect fish, experienced neurological symptoms with or without gastrointestinal symptoms. With the assistance of the notifying doctor and the organiser of the group, active case finding was commenced and it was determined that 46 people (29 adults, 17 children) had eaten at the banquet. Children ate from a different menu, with only one child eating any of the suspect fish.

A questionnaire, adapted from the standard Queensland Department of Health 'Ciguatera Questionnaire', was administered by phone to all banquet attendees or their parents. Demographic details and information on presenting symptoms were obtained in addition to the particular dishes and the quantities thereof consumed by each case.

All cases were provided with written information on ciguatera and advised to abstain from consumption of alcohol and fish for at least 3 months to prevent recurrence of symptoms.<sup>2,3</sup> To gather information on the duration of symptoms, and whether any new ones had appeared since the first interview, follow-up interviews were conducted with cases at weeks 3 and 10 post-exposure. The restaurant manager was contacted and interviewed about the source of the fish and the method of its preparation.

## Results

On 15 September 1997 a live 16.2 kg Maori Wrasse fish (delivered to the restaurant by a seafood wholesaler) was used in the preparation of four separate dishes. One dish contained the head and another the intestines of the fish. The four dishes were served exclusively that day to a large group as part of a banquet meal. Investigations at the restaurant revealed that while most of the fish had been served at the banquet, a small portion of the flesh and the backbones had been reserved for soup.

The wholesaler reported that the fish was the largest of three in a consignment from Queensland. The other two of the same species, but smaller (8.1 kg and 8.6 kg) had been delivered to two City restaurants. One fish was eaten on 15 September with no reported illness attributed to its consumption, the other was seized (live) with the proprietor's consent.

Enquiries by Queensland Health Department established that the 16.2 kg Maori Wrasse served at the banquet had been caught off Trunk Reef in Queensland. The other two fish were purchased from another supplier and the area where they had been caught could not be confirmed.

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All 30 individuals who consumed the fish at the banquet reported having at least one symptom. Cases (age range 13 to 69 years) presented typically with gastrointestinal and neurological symptoms. The main symptoms are listed in the Table.

The incubation period ranged from 2 to 27 hours (median 8 hours). Symptoms varied in severity. Of 21 people (70%) seeking medical attention, 17 were seen at four different hospitals with 3 admitted overnight. The other 4 attended local medical practitioners. Nine were treated with intravenous mannitol.

At week three, 22/30 (73%) were still symptomatic (2 were lost to follow up). Symptoms included paraesthesia of the extremities (13), weakness (11), and myalgia (11). A few developed late symptoms of itch (13), dysuria (3), and rash (2). Of the nine given mannitol, one had recovered completely. The other eight reported feeling better but still had some residual neurological symptoms such as paraesthesia and hot and cold temperature reversal.

By week ten, 9/18 cases were still symptomatic (a further 4 cases were lost to follow up).

## Discussion

Ciguatoxin, which accumulates through the food chain, is thermostable and is not destroyed by cooking, freezing or other fish-processing methods. It does not affect the taste or texture of the fish. In humans, ciguatoxin produces

gastrointestinal and characteristic neurological symptoms, consisting mainly of sensory disturbances (Table).

Diagnosis in this outbreak was based on the food history, and clinical presentations consistent with those reported in previous outbreaks.<sup>1,2,4</sup> Ciguatera poisoning is usually self-limiting with signs and symptoms generally subsiding within several days from onset. In a few cases neurological symptoms can persist for several years.<sup>1,3</sup> Treatment is mainly supportive, but mannitol infusion has been found to be beneficial, even when administered up to a week after the onset of symptoms.<sup>4,5,6</sup> We were unable to ascertain whether severity or multitude of symptoms related to the amount of fish consumed, or particular dish eaten.

Whilst reports of ciguatera fish poisoning are not infrequent in Queensland, this was only the second known outbreak reported in Victoria over the past 20 years. In 1994, coral trout was epidemiologically implicated in an outbreak of suspected ciguatera fish poisoning.

Although cases are rarely reported in Victoria, as the condition is not notifiable and is often likely to go unrecognised, the true incidence is unknown.

## Public health measures

Ciguatoxin is known to be concentrated in the liver, roe, head and other viscera of suspect fish, and the larger the fish the greater its chance of being toxic.<sup>1,3,4</sup> Many of these anatomical items are popular with the Asian community, and for banquet style meals dishes could be prepared from large fish. Certain fish known to be associated with ciguatera fish poisoning are generally not accepted for sale in Queensland.<sup>1,2</sup> This outbreak shows that other previously implicated species are being marketed in Victoria. It also illustrates how changing eating habits and food distribution patterns can lead to outbreaks of ciguatera fish poisoning in locations where it is uncommonly reported.

The low prevalence of the toxin in fish (in areas known to have contaminated fish, 1 in 5,000 coral trout is estimated to be toxic<sup>1</sup>) and the lack of a simple routine test for the toxin means consumer education is important. We identified a need to inform Asian restaurateurs of the risk of ciguatera fish poisoning and the need to avoid large reef fish, especially the head and other viscera.

A fact-sheet on ciguatera, adapted from the Queensland pamphlet *Ciguatera Poisoning-Information and Treatment*,<sup>2</sup> was circulated with the monthly newsletter of the Victorian Association of Chinese Restaurateurs (with a membership of around 200) and information was also published in the Newsletter of the Victorian Multicultural Council. This fact-sheet has also been translated into three Asian languages and has been made available to all local government environmental health officers for distribution to relevant food premises within their municipalities.

The public health measures initiated as the result of this outbreak have demonstrated the value of notifying public health authorities of incidents such as that reported here.

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**Table. Number and proportion of symptoms reported in cases involved in an outbreak of ciguatera fish poisoning, Melbourne, September 1997**

| Symptom                       | Number of cases |    |
|-------------------------------|-----------------|----|
|                               | n = 30          | %  |
| <b>Gastrointestinal</b>       |                 |    |
| Diarrhoea                     | 20              | 67 |
| Abdominal Pain                | 14              | 47 |
| Nausea                        | 9               | 30 |
| Vomiting                      | 5               | 17 |
| <b>Neurological</b>           |                 |    |
| Paraesthesia of hands         | 26              | 87 |
| Paraesthesia of feet          | 23              | 77 |
| Hot/cold temperature reversal | 19              | 63 |
| Circumoral paraesthesia       | 17              | 57 |
| Ataxia                        | 11              | 37 |
| Tremors                       | 7               | 23 |
| Dental pain                   | 4               | 13 |
| <b>Others</b>                 |                 |    |
| Myalgia                       | 23              | 77 |
| Weakness                      | 21              | 70 |
| Chills                        | 21              | 70 |
| Arthralgia                    | 17              | 57 |
| Neck Stiffness                | 10              | 33 |
| Pruritis                      | 8               | 27 |
| Shortness of breath           | 4               | 13 |
| Dysuria                       | 3               | 10 |

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### *References*

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