CIGUATERA FISH POISONING
GUIDE FOR HEALTH CARE PRACTITIONERS

To date, no vaccine nor specific treatments are available to treat CFP, therefore only symptomatic treatment is provided. In the absence of clinical studies with positively proven efficacy, the treatments mentioned below are purely informative.

DIGESTIVE DISORDERS
Antidiarrheal, antisecretory, antiemetic, antispasmodic drugs.

CARDIOVASCULAR DISORDERS
Atropine (IV or IM), cardiac analeptics in case of severe bradycardia and rehydration in case of severe hypotension.

NEUROLOGICAL AND MUSCULAR DISORDERS
Pain: analgesic and nonsteroidal anti-inflammatory drugs.
Pruritus (itching): H1 anti-histaminic drugs.

Peripheral neuropathies and asthenia:
- In acute phase:
  - Mannitol: in the case of nervous system impairment, perfusion of 0.5 to 1 g/kg of body weight over a period of 30-45 minutes, followed by 12 hours after the poisoning, for maximum effectiveness. Precautions: make sure the patient is properly rehydrated before mannitol administration.
  - During the course of treatment: multivitamin complex based on B vitamins (B1, B6, B12) and C.
- Chronic forms: amantadine, fluoxetine, gabapentin, cholestyramine.

It is recommended to follow lifestyle and dietary advice during one month or as long as conditions are persisting.

BREAST-FEEDING WOMEN
Due to the risk of transmitting Ciguatoxins to the infant through breast milk, it is recommended to suspend breast-feeding for several weeks.

TRADITIONAL MEDICINE AND CIGUATERA
In the Pacific, a remedy based on leaves of Octopus bush tree (Heliotropium foertherianum) or Tahiniu/Tohori-nu is often used by local populations to treat CFP. Five to ten yellow leaves are taken from the tree, rinsed, then dipped into 1 liter of water, boiled until it is reduced by half. The preparation can be taken hot or cold, in one or several intakes. In order to be effective, the decoction must be administered from the very first signs of the poisoning and never for more than three days in a row, according to the principles of the traditional Polynesian medicine.

Caution: the preparation must be used fresh and not for keeping. The concentrations of the active principle in H. foertherianum leaves may also vary from one island to another.

HYPERSENSITIVITY
Following CFP, the ingestion of certain types of food/beverages as well as specific circumstances (see below), may revive clinical manifestations such as itching, neurosensories disturbances, muscle pain/weakness, intense tiredness, headache, sleep disorders, general malaise, etc.

The intensity and nature of these manifestations as well as the factors responsible for their aggravation and reoccurrence may vary from one individual to another.

This “hyperresponsivity” condition may last for several weeks, months or even years, depending on the individual, and proves particularly disabling.

The adoption of a specific elimination diet and the avoidance of certain behaviors/situations is essential and must be followed at least during the first month following the poisoning event or as long as the adverse reactions persist.

Keeping a diary will help patients to identify food, beverages and situations that must be avoided. This will also help survey how this “hyperresponsivity” condition changes over time.

A special attention should be paid to the following items, which are likely to revive clinical manifestations of the disease, and should be avoided in the event of a reaction.

HYPERSENSITIVITY

FOOD, BEVERAGES AND BEHAVIORS TO AVOID FOLLOWING A POISONING

MARINE AND FRESH WATER PRODUCTS
- Lagoon, open-sea, fresh water fish, shellfish, seaweeds.
- Food supplements based on marine products (fish oil-based omega-3, spirulina...).
- Sauces and flavors based on marine products (oyster sauce, shrimp chips, ...).

ANIMAL AND VEGETABLE PROTEINS
- Beef, pork meat, chicken, eggs, soya, etc.
- Animal or vegetable protein powder and even by-products may also be poorly tolerated.

BEVERAGES
- Alcohol.
- Coffee and caffeine-based beverages, tea
- “Energy drinks”.

MISCELLANEOUS
- Nuts (walnuts, peanuts...).
- Spices, high-fat food.
- Dairy products, chocolate, histamine-rich or -releasing products, glutamic acid.

BEHAVIORS AND SPECIFIC INSTANCES
- Intense physical activity / effort, contact with cold water/objects, temperature variations, exposure to sun, altitude and pressure variations, stress.

TOXINS
- Gambierdiscus is capable of producing several families of neutoxoins, including ciguatoxins (CTXs), responsible for human poisoning.
- CTXs are colorless and odorless poly-cyclic polyether derivatives, resisting to cooking, freezing, smoking, etc.
- CTXs’ main targets are voltage-gated sodium channels.
- Due to their lipophilic nature, CTXs are found in higher concentration in fish head and viscera.
- To date, over forty different CTXs congeners have been identified.
- The suite of CTXs present in contaminated fish may vary significantly from one species to another; a single species may host several different CTXs.
- CTXs are bioaccumulated and biotransformed along the food chain.
- This biotransformation process increases the toxicity of CTXs congeners.

Biological, genetic and environmental factors (see below) may increase the risk of ciguatera development.

BIODEGEOGRAPHY OF CIGUATERA FISH POISONING (CFP)
At a global scale, CFP is endemic in tropical and inter tropical regions, with a predominance for lagoon and reef environments. However, CFP may also be observed in coastal waters devoid of coral reefs.

The Pacific Ocean (Cook Islands, French Polynesia, Marshall Islands, etc.) is by far the reservoir of choice for CFP. The number of CFP cases officially reported worldwide is estimated between 50,000 and 100,000 cases annually; however, these statistics likely only represent 10% of the actual cases, due to the high under-reporting of the disease. In the last decade, new CFP areas have emerged most notably as a consequence of climate change which may stimulate the geographical expansion and proliferation of the toxin-producing microalgae to previously unaffected areas.

In French Polynesia, CFP affects all island groups without distinction. At the scale of an island, areas such as passes or channels, where deeper reef slope must be exposed to natural or anthropogenic disturbances, as well as those with intense human activity (construction, quarrying, dredging, etc.) present an increased risk of ciguatera development.
IN FRENCH POLYNESIA...

EPIDEMIOLOGICAL MONITORING NETWORK AND IT. TOOLS TO IDENTIFY SPECIES AND AREAS AT RISK OF CIGUATERA

French Polynesia has implemented a CFP monitoring network that provides information about the CFP cases reported by physicians following medical consultations. The anonymous data thus collected are used to produce a CFP risk map available online (www.ciguatera-online.com), that allows the follow-up of the evolution of toxic fish species and areas.

A catalog of the main fish species at risk of CFP in French Polynesia is also available online.