CIGUATERA FISH POISONING

Example of Epidemiological Surveillance & Risk Management Strategy in French Polynesia
Ciguatera is a non infectious seafood poisoning...
...due to the consumption of fish or marine invertebrate from tropical and subtropical regions...
...that have been contaminated by a family of neurotoxins, the Ciguatoxins,...
....produced by a dinoflagellate from *Gambierdiscus* genus.
CIGUATOXIC RISK INCREASED IN DEGRADED REEF ECOSYSTEMS
Dead corals covered of macroalgae

→ Good habitat for *Gambierdiscus* cells

→ Proliferation of *Gambierdiscus* cells +++

→ Potential ciguatoxic risk

Salinity

Nutrients

Temperature $^{\circ}$
Ciguatoxins (CTXs)
Any fish / marine invertebrate exposed to blooms of toxic strains of *Gambierdiscus*, ... or having consumed a fish or marine invertebrate contaminated with CTXs must be regarded as a potential ciguatera vector!!!

Example of species implicated in CFP transmission in French Polynesia
Ciguatera: a complex pathology

- Central Nervous System
- Cardiovascular
- Digestive
- Joint
- Muscle
- Peripheral Nervous System

Mortality rate <0.1%
- Decrease quality of life +++
- Chronic pathology (>20%)

No specific/efficient treatment
- Conventional medicine (supportive care)
- Traditional medicine (>50%)

No diagnosis tool

SYMPTOMS
- Nature
- Chronology

ORIGIN OF THE POISONING

EXCLUSION DIAGNOSIS

- H. foertherianum
- Barringtonia asiatica
- Punica granatum
CFP at a Global Scale (50,000-100,000 cases/year?)

**IMPORTANT UNDER-REPORTING**

- Absence of CFP surveillance program
- Difficulty to diagnose CFP due to the lack of biological test and Health Workers awareness ➔ Misdiagnosis / no diagnosis
- CFP is not a reportable disease ➔ Reports on a voluntary basis
- The lack of specific/efficient treatment ➔ Low frequentation of medical structure

CFP endemic area  New endemic area  Imported CFP cases
CIGUATERA SURVEILLANCE

Example of French Polynesia
Population: 276,000 inhab.

Territory: 118 islands in the middle of the South Pacific Ocean

Area: as wide as Europe

CFP incidence: 300-500 cases/year

First CFP case description: 16th century
First CFP epidemiological studies
Implementation of a permanent CFP Surveillance Programme

Health Directorate of FP & Institut Louis Malardé (ILM)

1960’s

Public Health professionals + Patient diagnosed with CFP

→ CFP Reporting Form (manually filled)

→ Forms returned by Fax, mail or email to ILM

→ Data manually reported in a local database

2007
<table>
<thead>
<tr>
<th>INTENSITY</th>
<th>Mild</th>
<th>Moderate</th>
<th>High</th>
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<tbody>
<tr>
<td>BRADYCARDIA</td>
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**CARDIOVASCULAR SIGNS**

**DIGESTIVE SIGNS**

- Nausea
- Vomiting
- Diarrhea

**GENERAL AND NEUROLOGICAL SIGNS**

- Tingling extremities (hands, feet)
- Touch, neuro-sensitives disturbances
- Dysesthesia (in contact with cold/hot)
- Itching
- Asthenia
- Headache
- Dizziness/Balance or walking disorders (underline)
- Vision disorders
- Muscular disorders (pain, cramps, weaknesses...)
- Joint pain
- Hypothermia: Temperature [ ] °C
- Burn/tingling of lips, mouth, throat
- Orofacial pain (teeth, jaw, face)
- Dysgeusia (taste alteration)
- Urogenital discomfort/itching/burning
- Hallucinations

**Other symptoms/Observations**

**Time elapsed between the meal and the onset of symptoms**

- [ ] < 30 min
- [ ] < 2h
- [ ] < 12h
- [ ] > 12h

**Number of previous CFP/PSP**

**Number of other person(s) also concerned by the poisoning (in addition to the patient)**
Implementation of an Online CFP reporting System

1960’s

2007

2014

Public/ Private Health professionals

General population

Online Reporting System

Data automatically reported on an Online database

www.ciguatera-online.com
Development of a new online reporting application.

Extension of CFP surveillance to other territories of the Pacific region...and beyond!
CIGUATERA
Risk Management

REGULATION - TRACEABILITY

INFORMATION – PUBLIC OUTREACH
The government of FP is aware of these issues and is willing to move things forward!

No traceability system!!!

Survey > fishermen are not opposed!

The only official text that prohibits the sale of fish species due to (cigua)toxic risk dates from 1939!!!

"Given the danger posed by the consumption of certain species of fish... it is strictly forbidden the sale of the following fishes:
- Blue spotted Grouper
- Black saddled Coral Grouper
- Marbled grouper
- Humphead wrass
- Great Barracuda
- Black spot snapper
- Red snapper
- Toby fish"

Expertise requests for monitoring the ciguatoxic status of areas subjected to works done by the government near the lagoon
INFORMATION-CIGUATOXIC RISK MAP

**real time** (use data collected through the online CFP reporting system)

Available in **free access** on [www.ciguatera-online.com](http://www.ciguatera-online.com)

Allows to follow the evolution of ciguatoxic areas and identify « at risk » species for each island.
INFORMATION-CFP ANNUAL REPORT

Authorities
Health professionals
Fisheries
Research lab
Social networks
Local media
On demand,...
WHAT TO DO AFTER A CIGUATERA POISONING?

1. **SEE A DOCTOR**
   - especially elderly, persons suffering from heart diseases and pregnant women.

2. **REPORT POISONING**
   - to veille.ciguatera@ilm.pf or www.ciguatera-online.com

3. **FOLLOW RECOMMENDATIONS**
   - on diet and lifestyle, during the month following the poisoning and as long as the symptoms persist. Indeed, most patients develop hypersensitivity to certain foods, beverages or situations likely to revive symptoms, especially neurologic ones. During this period, keep an eye on/avoid:
     - Any marine and fresh water product as well as byproducts (dietary supplements, sauces and flavors, ...).
     - Beef, pork meat, chicken, eggs, soya, protein powder.
     - Alcohol, coffee, “energy” drinks.
     - Nuts (peanuts, ...), high-fat foods, dairy products, histamine-rich or -releasing products, glutamic acid.
     - Intense physical activity, contact with cold water/objects, temperature variations, exposure to sun, altitude and pressure variations, stress.
     - Heavy meals. Split meals.

4. **BREASTFEEDING**
   - Suspend breastfeeding for several weeks. See a physician for advice.

**MANIFESTATIONS**
- Mostly neuro-sensitive, cutaneous manifestations.

**EVOLUTION**
- Occurring continuously at risk of relapses lasting a year triggered by the consumption of foods, beverages and/or exposure to cold.

**SYMPTOMATIC TREATMENT**

**INFORMATION BROCHURES / FLYERS FOR PHYSICIANS AND PATIENTS**
- Flyer for patients (Fr, Tah)
- Guide for Health Care Worker (Eng, Fr)

**CLINICAL ELEMENTS**
- Incubation time: <24 hrs.
- Gastrointestinal duration <72 hrs.
- Cardiovascular duration <72 hrs.
- Neurological signs, neuro-sensitive stimuli, extreme temperatures, disorders, transient.
- Foodborne illness.
- Consumption of known to harbor ciguatera, Emperor, Jack, Moray eel, Wrasse, Sea urchin, Trochus...

**EXAMINATION**
- Allergic manifestations:
  - Fever
  - Consumption of products...

**TRADITIONAL REMEDIES**
- Decoction prepared from Bush (Tahinu/Toho)
PUBLIC OUTREACH
(2018-...)

Radio Spots of 30 sec
In French and Tahitian

TV Spots of 30sec
In French and Tahitian

Citizen science projects

Workshops with schoolchildren

Public meetings...
« ….Ciguatera as an indicator of environmental disturbances of tropical marine ecosystems… »

Ciguatera as a Sentinel disease of Climate Change?
Mauruuroa

THANK YOU FOR YOUR ATTENTION

« Fishing with friends » Kaukura Island, French Polynesia

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clem-ilm
www.ciguatera-online.com
facebook.com/ciguateraonline
MEASURE THE IMPACT OF COMMUNICATION EFFORTS AMONG MEDICAL PROFESSIONALS (March 2018)

Online questionnaire-based survey
Link to the web page sent by email
10-15 minutes to fill in

Public Health professionals (doctors and nurses)
Private and emergency partitioners
Urban and rural hospitals, dispensaries, infirmaries

Assess their level of knowledge about CFP
Assess the disparities in CFP diagnosis
Assess the disparities in patient’s management, counseling
Assess their involvement in the CFP Surveillance Programme,....