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Short communication

Food-poisoning outbreak and fatality following ingestion of sea turtle meat in the rural community of Ndrondroni, Mohéli Island, Comoros, December 2012

Saindou Ben Ali Mbaé [a, b], Mohamed Mlindassé [a], Saindou Mihidjaé [c], Thomas Seyler [b, d, *]

[a] Surveillance Unit, Ministry of Health, Ngazidja, Comoros
[b] Field Epidemiology Training Programme of the Indian Ocean (FETP-OI), Surveillance Unit of the Indian Ocean Commission, Mauritius
[c] Regional Health Agency of Mohéli, Mohéli, Comoros
[d] EpiConcept, Epidemiology Department, 47 rue de Charenton, 75012, Paris, France

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ABSTRACT

On 24-December-2012 newspapers reported food-poisoning cases in Ndrondroni, Comoros. The authors conducted an investigation and a case-control study to identify the source and control the outbreak. They identified eight cases. A 6-month breastfed infant died. The results suggest consumption of Eretmochelys imbricata caused the outbreak. A bio-toxin ingested by the turtle might be the source. The local authorities informed the population on the danger of turtle-meat consumption. Cooking does not destroy the toxin.

1. Introduction

The Union of the Comoros is located in the south western region of the Indian Ocean, north of Madagascar. It has a population of 717 500. Per capita Gross Domestic Product was US$831 in 2012 (World Bank, 2013) and under-five mortality rate was 78 per 1000 live births in 2012 (World Health Organisation and Global Health Observatory, 2013). Mohéli is one of the Islands of the Union of the Comoros. It is 290 km^2 and has an estimated population of 38 000. There is one public hospital in the capital Fomboni, and three district health centres. Fishing and agriculture are the main economic resources of the island. A marine park was established in 2001 on the southern coast of the Island in order to protect marine biodiversity and encourage ecotourism. It is illegal to kill sea turtles and consume its meat in Mohéli.

On 24 December 2012 a local newspaper reported cases of food-poisoning in the village of Ndrondroni (3688 inhabitants) in Mohéli, located in the Nioumachoua region. On 8 January 2013, a team of epidemiologists from the surveillance unit of the ministry of health, the regional health agency and the Indian Ocean Commission surveillance unit conducted an investigation to confirm the outbreak, identify the source, the vehicle and implement control measures.

2. Methods

The outbreak investigation team did case finding in Fomboni hospital and at Nioumachoua district health centre, interviewing doctors and reviewing outpatient and inpatient registers. The authors defined a suspected case as an inhabitant of Ndrondroni who consulted between 19 December 2012 and 1 January 2013 with a written diagnosis of food poisoning. To identify the affected area, they reviewed the patients' home address and interviewed community health workers.

Once the affected area in Ndrondroni was identified, the authors did a door–to-door survey with community health workers and defined a probable case as an inhabitant of the affected area

* Corresponding author. EpiConcept, Epidemiology Department, 47 rue de Charenton, 75012, Paris, France.
E-mail address: thomas.seyler@gmail.com (T. Seyler).

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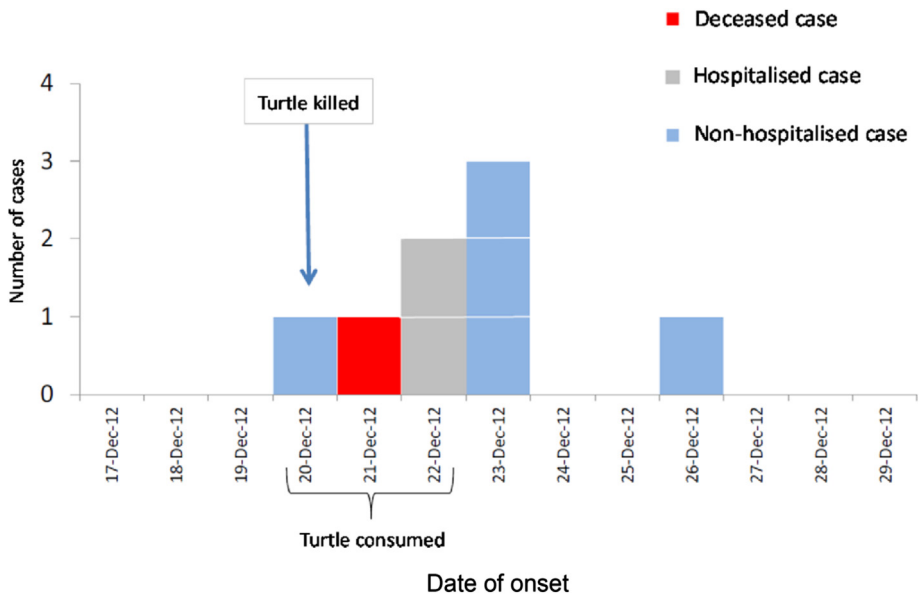

Fig. 1. Probable cases (N = 8) of food-poisoning, by date of onset, Ndrondroni village, Comoros, December 2012.

reporting at least two of the following symptoms between 19 December 2012 and 1 January 2013, with no other known diagnosis: malaise, chills, abdominal pain, nausea, myalgia, asthenia, diarrhoea, vomiting, dizziness, rash, itching, neurological signs, shortness of breath, fever, paresthesia, memory loss.

The outbreak investigation team visited all the households in the affected area and interviewed all probable cases after informed consent. In each household, the authors randomly selected two people who did not report any symptoms between 19 December 2012 and 1 January 2013 (controls). After informed consent, they collected demographic and socio-economic data, information on symptoms (including date of onset, outcome and health care utilization), food and water consumption for the week prior to symptom onset (for cases) and between 16 December 2012 and 1 January 2013 (for controls). They also collected information on the species and number of animals present in and around the houses. They computed the odds of exposure among cases and controls, and calculated the corresponding odds ratios (ORs) for each exposure with 95% confidence intervals (95% CI). To assess the presence of a dose-response with food items, they calculated ORs for different quantities of food consumed. They did a cohort study among members and guests of the households in which turtle meat was cooked. For each exposure the authors calculated attack rates and the corresponding relative risks (RR) with a 95% CI. They used the statistical package STATA 12 (TX: StataCorp LP). The authors interviewed employees from the local protected marine park. This investigation was part of public health response activities and complied with ethical standards of the Ministry of Health.

Table 1
Frequency of symptoms among probable cases (n = 8) of food-poisoning, Ndrondroni, December 2012.

Symptoms	Frequency (%)
Itching	5 (63)
Asthenia	4 (50)
Vomiting	3 (38)
Abdominal pain	3 (38)
Rash	2 (25)
Myalgia	2 (25)
Shortness of breath	2 (25)
Nausea	2 (25)
Itching of the month/throat	2 (25)
Fever	1 (13)
Diarrhoea	1 (13)
Vertigo	1 (13)
Paresthesia	1 (13)
Dysphagia	1 (13)
Mouth burn	1 (13)
Sore throat	1 (13)
Erectile dysfunction	1 (13)

3. Results

The authors identified 49 suspected cases from registers at Fomboni hospital and Nioumachoua district health centre. All suspected cases were coming from a neighbourhood of Ndrondroni village with twenty-nine households (estimated population of 125 inhabitants). The team visited 21 households (eight empty at the time of the survey). The twenty-one households (72.5%) accepted to participate to the study. Based on the door-to-door survey the authors identified eight cases (the attack rate in the affected area was 6.4%). The onset of symptoms of the first and last cases occurred on 20 and 26 December 2012, respectively (Fig. 1.). The median age was 21.5 years (range: [0–40]). Itching (5) (including of the mouth and throat), asthenia (4), vomiting (3) and abdominal pain (3) were the most frequently reported symptoms (Table 1.). Two patients also reported paresthesia (1), dysphagia and mouth burn (1). One female infant aged 6 months died. Two cases aged 18 and 27 years were admitted to Nioumachoua district health centre as inpatients, located 6 km away from Ndrondroni.

The authors included all eight probable cases and 30 controls in the case control study. The median age of controls was 20 years, (range: [2–60]). None of the adult cases and 12/20 (60%) adult controls had no formal schooling. Six cases (75%) and 4 controls (13%) reported having consumed turtle meat (OR = 19.5, 95%CI [2.2–233.5]) (Table 2.). One case and 3 controls reported having consumed 1 to 5 pieces (OR = 4.3, 95%CI [0.05–103]), 3 cases and 1 control more than 5 pieces (OR = 39, 95%CI [1.7–2118]).

The authors included 11 inhabitants in the cohort study (7 cases, attack rate 64%). Compare with those who had consumed 1 to 5 pieces of turtle meat (attack rate of 25% (1/4)), those who had consumed more than 5 pieces were 3 times more likely to develop