Regional Public Health
Better Health For The Greater Wellington Region

Communicable Disease Bulletin

Circular letter to: General Practitioners and Practice Nurses

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Beware the Big (Reef) Fish

In December 2009 a local general practitioner notified Regional Public Health about two people in one family with lethargy, myalgia, arthralgia, numbness and tingling of the limbs, pruritis, and hot-cold temperature reversal. There were reports that other family and close contacts had similar symptoms.

It was established that there were six people in total reporting a similar constellation of symptoms, all of whom had partaken of a large 7.75kg fish from a local seafood retailer in the 48 hours before the symptoms began.

The family mentioned the fish because of its unusual size. The general practitioner had recently seen a case of histamine poisoning related to fish consumption and so was suspicious of a potential link. There were no gastrointestinal or typical allergic symptoms in any of these cases.

The public health registrar and health protection officers investigating the case contacted all those who had eaten the fish to clarify symptoms and to establish exactly what had been eaten by each. The involvement of a general practitioner who spoke the family's mother tongue greatly assisted the investigation.

Of the ten people who had eaten the fish, six had become unwell with the same symptoms. Three of the asymptomatic individuals had only eaten a very small amount of the fish and remained well. The remaining person had eaten two small pieces of fish, and reported abdominal and back pain, which was attributed to recent physical activity by the patient, and resolved rapidly. No one who had not eaten the fish had become unwell.

Donu

The fish had not tasted unusual in any way.

The tail and three steaks from the fish had been returned to the retailer by the family, and so were able to be taken for analysis. The fish was identified as a donu (plectropomus leopardus) which had been caught in Fijian waters. This fish is also known as a leopard coral trout or leopard coral grouper.

The public health registrar identified many of the symptoms as being those of ciguatera fish poisoning though the lack of gastroenterological symptoms went against the typical clinical picture.

The case symptoms were discussed with the National Poisons Centre in Dunedin. Then, on advice from the Ministry of Health, contact was made with a Fijian physician at Suva Hospital. He was able to confirm that the clinical presentation was consistent with their usual experience of ciguatera fish poisoning, and that locally it was common not to have gastrointestinal symptoms despite the general description of this type of poisoning.

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Interestingly locals were reportedly aware that this particular type of fish should not usually be eaten when it is large in size, because of the risk of poisoning.

The donu samples subsequently confirmed the diagnosis with ciguatoxin levels in the fish samples 60 to 100 times the concentration required to cause human illness. Other testing detected no histamine present in the fish samples. There is no test available for ciguatoxin in human cases so the only way of confirming the diagnosis was by testing the fish itself.

The donu fish had been imported in a shipment of 476Kg of Fijian reef fish, which were all subjected to a 'Seize and Detain' order followed by supervised disposal. A quantity had already been sold to the public so recall notices were issued and a public health alert was sent to all general practices, emergency departments, and after-hours medical centres in the Wellington region. There were no other reports of illness.

Ciguatera Fish Poisoning Information:

- Symptoms are caused by ciguatoxin (polyether toxins), which may be present in any of hundreds of species of tropical marine reef fish.
- The toxins are produced by dinoflagellate algae. These are eaten by small fish which in turn are eaten by bigger fish. The toxins accumulate at the top of the food chain.
- The dinoflagellates feed on dead or damaged coral, so events that cause such damage to reefs may provoke an increase in cases of poisoning.
- The toxins do not alter the taste of the fish and are heat-stable. Cooking does not neutralise the toxins.
- Clinical symptoms may be severe and neurological symptoms may last for weeks or up to several years in some cases. Deaths are reported as rare although there are exceptions. In 1994 in Madagascar 500 cases and 98 fatalities were reported after consumption of shark.
- Gastrointestinal and neurological symptoms predominate including: diarrhoea, abdominal pain and vomiting, paraesthesiae, numbness, myalgia, malaise, headaches, ataxia, dizziness and cold allodynia. Urinary symptoms, itching and sweating, rashes and other symptoms are also reported.

Supervised Disposal

- Treatment is supportive as there is no specific treatment or antidote. Medications such as mannitol and amitriptyline have been used. Recently however a trial of intravenous mannitol vs saline showed no significant improvement in patients receiving mannitol. Amitriptyline is sometimes used to reduce distressing acute or persistent neurological symptoms.
- General Practitioners should consider discussion of the potential risks of consuming (large) reef fish with people embarking on tropical holidays.
- Tips to reduce the risk of ciguatera fish poisoning include avoiding consumption of large (over 2kg) reef-dwelling fish, and only eating small portions of any one reef-dwelling fish.

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- Leo J. Schep, Robin J. Slaughter, D. Michael G. Beasley. Ciguatera poisoning; an increasing phenomena in New Zealand. NZMJ 29 January 2010, Vol 123 No 1308; ISSN 1175 8716 Page 101. URL: http://www.nzma.org.nz/journal/123-1308/3958
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- Donu image: www.murchisonboathire.com.au/fish_species2.htm

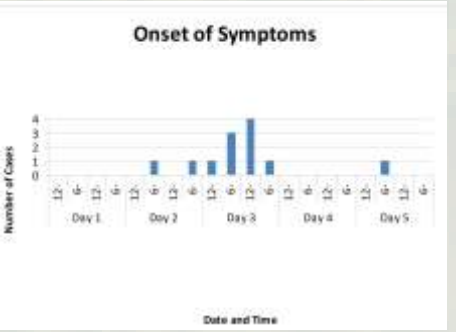
Food-Borne Norovirus No Surprise

Two recent outbreaks illustrate a disease pattern that may come as a surprise to those who only think of norovirus as being a disease in rest homes or on cruise ships.

Outbreak 1:

In September 2009 attendees at a buffet conference dinner got more than they ordered when at least 16 of the 83 attendees came down with illness. 12 of these eventually met the case definition for the gastroenteritis outbreak and six cases were laboratory confirmed as norovirus. Interestingly, one conference attendee was found to have been unwell early on the first day of the conference. As such, the possibility of person-to-person spread as the cause of the outbreak was initially considered to be a likely scenario. However, this case subsequently tested positive for a different norovirus genogroup to that identified in the remainder of cases tested. Therefore this case was excluded as a source of the outbreak, and a foodborne outbreak was considered more likely.

Conference Dinner Outbreak:



Epidemiological investigation revealed that consumption of raw oysters on the first night of the conference was the most likely source of the infection with a rate ratio of 7.95; 95% confidence interval 1.92 – 32.96. The attack rate for infection among those who consumed oysters was 45.5% (ten out of 22). Samples of the oysters and other foods consumed at the conference were not able to be obtained due to the delay between the event and notification, with no food items served at the conference remaining. Samples of similar food items (but different batches) were tested, and came back negative for pathogens, including norovirus. In the subsequent investigation some food handling procedures were highlighted as needing improvement. Test results from the producer raised the possibility of faecal contamination at the supply level. However, repeat e.coli testing (used as an indicator organism) on the batch was within the acceptable range. Based on the investigation findings, it was decided to take a collaborative precautionary approach, and conduct a recall on the implicated batch of oysters.

Outbreak 2:

In February 2010 a large group of university students and university staff attending a marae in the Manawatu developed diarrhoea and vomiting. Two groups of students and staff attended the marae with only the first group becoming unwell. The first group arrived on the Wednesday and left the marae on the Thursday. The diarrhoea and vomiting began on the Friday with 32 of the 72 people questioned becoming sick. The symptoms lasted approximately 24 hours. The second group arrived on the Thursday and remained well.

Food questionnaires were returned by a high proportion of the group. These indicated that a seafood salad eaten on the Wednesday night was the likely source of the outbreak. MidCentral Health Public Health subsequently narrowed the highest risk food item down to the prawns in the seafood salad. The prawns unusually had reportedly been added raw. The other ingredients to the seafood salad; surimi and marinated mussels, were considered very low risk. Only one faecal specimen was obtained in this outbreak, from a marae food handler, and this tested positive for norovirus. The handler developed symptoms midway through the outbreak and so was considered a case rather than a source.

Norovirus Information

The Public Health response to these cases illustrates the type of approach used to follow up such cases. Norovirus is now one of the most common pathogens causing gastroenteritis outbreaks in New Zealand. While it is notifiable, the number of cases reported is a large underestimate because testing for norovirus is only available through Public Health Units. Medical practitioners are encouraged to contact Regional Public Health if there is any suspicion of linked cases of gastroenteritis.

- Norovirus has an incubation period of 10 to 50 hours, followed by an illness lasting between 12 to 60 hours .
- Symptoms include nausea, vomiting, diarrhoea and fever .
- Humans are the only known reservoirs of norovirus .
- Norovirus is known to be transmitted by the faecal-oral route, and by airborne transmission (usually from vomitus) .
- Consumption of raw oysters as a cause of norovirus outbreaks has been well-documented previously in the New Zealand setting . Simmons et al. performed a combined analysis of ten retrospective outbreak investigations occurring in Auckland between 1 September 1999 to 31 December 1999. The authors noted that there is a consistent association with consumption of raw or lightly cooked bivalve molluscan shellfish, especially oysters, and norovirus outbreaks. Oysters, as filter-feeders, have the ability to filter and concentrate viruses present in the surrounding water . The study found that the combined relative risk of illness for oyster consumption in these ten outbreaks (including those where consumption was not associated with a significant increase in risk) was 8.23 (95% CI 4.55 – 14.90; $p<0.001$). There was no evidence of a dose-response relationship in regards to the number of oysters consumed by each individual when information from the outbreaks was combined .

Annual outbreak surveillance reports show that norovirus is the most common infectious agent in all reported outbreaks (enteric and non-enteric). For example in 2008 norovirus was implicated in 33.9% of all enteric outbreaks and 29.2% of all foodborne outbreaks Also in 2008, consumption of oysters was implicated in eight out of 26 foodborne norovirus outbreaks.

Studies indicate that norovirus is a commonly implicated organism in foodborne outbreaks, and that seafood is a recognised vector of foodborne norovirus outbreaks in New Zealand.

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- Oyster image: scienceblogs.com

Campylobacter Notifications

Please remember that with all notifications of infectious gastroenteritis, the up to date occupation of the case and their worksite are very important pieces of information. Public Health staff use this to determine how rapid and how extensive a follow up is required.

Shigellosis: A Case for Handwashing

In March 2010 Regional Public Health was notified of two cases of shigellosis from the Naenae area of Lower Hutt. Regionally there have been 118 cases of shigellosis notified to Regional Public Health in the last 10 years from the Wellington, Hutt and Wairarapa regions together. This compares with a national figure of 1244 for the same time period. The cases are distributed across all ethnic groups with even spread between males and females, and with cases in all age groups from under 1 year olds to those older than 70 years. The recent cases should raise suspicion for this disease locally and are being investigated and followed up by Regional Public Health.

Shigellosis is by no means as common as campylobacter or salmonella but is considered significant because of the potential for severe disease in individuals, its high infectivity and the risk of epidemic spread. The infective dose is very low with 10-100 bacteria shown to cause disease in volunteers.

There are an estimated 600 000 deaths worldwide each year as a result of shigellosis, with two thirds of the cases and most deaths in children under 10 years old. Outbreaks are associated with crowding and with institutions particularly when hygiene is inadequate. Breastfeeding is protective for young children and infants. Shigella can affect primates but the only known significant reservoir is in humans.

The illness usually lasts 5 to 7 days if untreated. The incubation is normally 1 to 3 days but may be as short as 12 hours or as long as 7 days. Typical symptoms are of small volume loose bowel motions, often with blood or mucus, with fever and nausea. Strong cramps, vomiting and tenesmus may also be present. The diarrhoea may be watery. Convulsions may be a serious complication, in particular in children.

The severity of the illness and of an outbreak in general is dependant on factors such as the serotype of the shigella and on the background health of affected individuals and of the population. There are 4 species (serogroups) and multiple serotypes and subtypes. Shigella dysenteriae (shiga bacillus) spreads in an epidemic pattern and more often causes severe disease complications such as intestinal perforation, haemolytic uraemic syndrome and toxic megacolon, with mortality as high as 20% even in recent outbreaks. Shigella sonnei has a short clinical course and negligible mortality apart from in immunocompromised individuals. Some shigella strains can cause reactive arthropathies especially in predisposed HLA-B27 antigen positive individuals. Testing for shigella can be problematic because of short viability outside the human body requiring rapid processing of stool specimens.

Transmission is by the faecal – oral route. When handwashing is poor the bacteria can be transmitted from the hands including under fingernails to food. Faecally contaminated water or milk may directly transmit the disease. Flies can spread the infection to uncovered food.

The most important control measure in an epidemic is the provision of soap and clean water with an organised effort to promote effective handwashing.

Cases are infectious during the illness and while the bacteria are still present in the stools. This usually becomes clear within 4 weeks but may become chronic. Some asymptomatic individuals are infective. Appropriate antibiotic treatment usually reduces the infectivity to a period of a few days.

There are high levels of resistance to typical antibiotics such as cotrimoxazole, ampicillin and tetracyclines, and resistance also occurs to quinolones, so treatment choice for individuals should be made after consultation with infectious disease specialists or once sensitivities are available. Importantly, antimotility agents should only be given to adults receiving antibiotic treatment, and limited to 1 or 2 doses if absolutely required because of the risk of complications and of prolonging the illness.

Infected individuals are excluded from food handling, care of children or care of patients until there have been two clear faecal samples (or rectal swabs) taken 48 hours apart, with the first sample taken at least 48 hours after the completion of antibiotic treatment if this has been given.

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