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Notes from the Editor

There is a new virus in the Caribbean. Most people in Canada have never heard of chikungunya virus. Until recently it was one of those obscure vector-borne diseases found largely in Asia and Africa. But now it is a little closer to home. In December 2013, an outbreak of this dengue-like illness was identified in several Caribbean countries. And how many Canadians go to the Caribbean in the winter-time? Suddenly it is very possible that we will see chikungunya in Canada. It is not a nice disease; and it can linger. In this issue we have an Early Communication article on what you need to know to prevent, detect and manage it. Also in this issue, we offer some insights into how vaccine recommendations are made in Canada through two abstracts of statements from the Canadian Immunization Committee.

Early Communications

Summaries

Public Health Agency of Canada / Agence de la santé publique du Canada

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Early Communications

CHIKUNGUNYA OUTBREAK IN THE CARIBBEAN 2013-2014

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ABSTRACT

Background: In December 2013, the local transmission of the mosquito-borne chikungunya virus was confirmed for the first time in several Caribbean islands.

Objective: To outline what is known to date on the outbreak of chikungunya in the Caribbean, and identify what is being done to detect and limit this infection.

Results: PAHO/WHO has recommended that chikungunya surveillance be set up in countries where there is existing dengue surveillance. Prospective travellers should be advised to take personal protective measures to avoid mosquito bites to decrease risk of exposure. Patients typically present with fever and arthralgia. If there is a positive travel history, serology for both chikungunya and dengue virus infection should be considered after consultation with local public health officials. Treatment is supportive. Transmission in Canada is not expected.

Conclusion: Clinicians and public health professionals in Canada should be on the alert for sporadic cases of chikungunya virus in patients who present with fever and arthralgias after a stay in an affected Caribbean island.

INTRODUCTION

Chikungunya fever is a dengue-like illness caused by a virus transmitted to humans by the Aedes mosquitoes, primarily Aedes aegypti and Aedes albopictus. The name "chikungunya" is derived from the Makonde language (Tanzania and northern Mozambique) meaning « that which bends up » referring to the severe arthralgias that manifest with infection. The virus typically circulates in Africa and parts of Asia. However, sporadic imported cases and occasional outbreaks of chikungunya fever have occurred in other geographical regions such as in Italy in 2007 (1) and in France in 2010 (2, 3). Previously, only imported cases of chikungunya virus-associated illness with travel or infection abroad were reported in the Americas. Recently it has been reported in the Caribbean and for the first time local transmission has been verified in the western hemisphere.

Event description

On December 6, 2013, the Pan American Health Organization (PAHO)/World Health Organization (WHO) was notified of two confirmed cases of chikungunya virus on the Caribbean island of Saint-Martin/Sint Maarten (4). These were detected amidst a dengue fever outbreak, following an investigation of cases for whom the diagnosis of dengue was excluded. The health authorities of Saint Martin (northern French part) and Sint Maarten (southern Dutch part) are cooperating closely to respond to this outbreak.

In consultation with PAHO, a "suspect " case of travel-related chikungunya disease has been defined as a patient with acute onset of fever >38.5ºC (101.3ºF) who exhibits severe arthralgias or arthritis not associated with other medical conditions and has visited epidemic or endemic areas within two weeks prior to the onset of symptoms (5).

As of January 17, 2014, there have been 480 confirmed human cases of chikungunya virus in the Caribbean reported to PAHO/WHO with many additional cases under investigation (6). Indigenous cases of chikungunya virus have been confirmed on the islands of Saint Martin/Sint Maarten, Martinique, British Virgin Islands, Guadeloupe and Saint Barthélemy. An additional case from French Guiana has been associated with travel to Martinique and one from Dominica with travel to St Martin. Results are pending on two suspected travel-related cases in the United States (1 to Saint Martin and 1 to St Lucia). To date, there have not been any human cases of chikungunya virus reported among Canadian travellers returning from the Caribbean. The recent outbreak in the Caribbean islands marks the first indigenous transmission of chikungunya in the Region of the Americas.

Investigations and response

Working closely with PAHO, actions implemented by local authorities to date include:

- Epidemiological surveillance including syndromic surveillance and surveillance of severe cases.
- Vector control activities in the affected area that will rapidly be extended to the entire island, including around airports, schools, day nurseries, and hospitals.
- Communication and social mobilization: Information is being disseminated to health professionals, to the public (on individual protection and how to eliminate larvae breeding grounds), and to travellers by specific information in the airports.

PAHO/WHO has recommended that chikungunya virus surveillance be set up in countries where there is an existing dengue surveillance system taking different clinical presentations into account. Surveillance should be carried out to determine whether chikungunya virus may have been introduced, to track chikungunya virus once it has been introduced and then to track the disease once it is established (4).

Assessment

In 2012, Canadians made over 2.5 million visits to Caribbean countries (7). Therefore, travel-related cases of chikunguya chikungunya virus returning from the Caribbean can be expected. There is a risk to travellers going the Caribbean islands and they should be advised to practice personal protective measures against mosquito bites.

The current risk in Canada of local transmission of chikunguya chikungunya virus is low as the mosquitoes that typically transmit it among humans are not found in Canada.

RECOMMENDATIONS

Prevention

There is no effective vaccine or preventive medicine for chikungunya virus therefore preventive measures such as avoidance of mosquito bites and mosquito vector control should be implemented. (Table 1) These preventive measures are similar to those that are used to prevent other common mosquito transmitted diseases such as dengue and West Nile virus (8).

Travellers should be advised to contact their health care professional if they develop flu-like symptoms while they are travelling or within 12 days after their return to Canada.

Table 1: Personal Protective Measures against mosquito bites (8)

Avoiding mosquitoes:	Reduce exposure by avoiding times or places when/where mosquitoes are known to be active (e.g., by staying indoors during peak activity periods, minimizing exposure in rural areas or other habitats associated with specific vectors).
Physical Barriers:	Use screens on doors and windows. Wear appropriate clothing (e.g., full length, loose fitting and light-coloured garments). Use insecticide treated clothing, gear and bed nets.
Topical Repellents or Insecticides:	Use topical repellents that are registered in Canada on exposed areas of skin. Repellents that contain DEET (20-30%) or picaridin (20%) should be the first choice for adults. Repellents that contain picaridin (20%) should be the first choice for children aged six months to twelve years. For travel outside of Canada to endemic/epidemic areas, the risk for arthropod-associated diseases likely outweighs the risk of an adverse reaction to DEET or picaridin. In such situations, and if vectors cannot be otherwise excluded (e.g., through use of insecticide-treated netting), use of up to 10% DEET or 10% picaridin should be considered for infants under six months of age. Do not use repellent and sunscreen combination products. It is preferable to apply sunscreen first and allow it to penetrate the skin before applying repellent. Where this is not possible, apply both products even if such is done contemporaneously Use insecticide-treated clothing, gear and bed nets. Products treated with insecticides that repel and kill mosquitoes are not currently registered for use by the public in Canada. However, they can be purchased from on-line retailers in the United States or from travel medicine clinics in Canada prior to departure

	from Canada. United States Environmental Protection Agency registered products are preferred over those available in other non-Canadian jurisdictions (i.e., in countries of destination).

Early detection

It is important to obtain a travel history for anyone presenting with fever and arthralgia. Typically, after a 3 to 7 day incubation period (range 1-12) there is abrupt onset of fever and arthralgia with constitutional symptoms such as chills, headache, photophobia, conjunctival injection, anorexia, abdominal pain, and nausea. Migratory polyarthritis primarily involves the small joints of the hands, wrist, ankles, and feet with lesser involvement of larger joints. Rash may appear several days after disease onset and typically correlated with defervescence. The rash is most prominent on the trunk and limbs and may desquamate lasting for 1-7 days. Leucopenia and mild thrombocytopenia can be found. Neurological, cardiac, and hepatic complications are rare. (Table 2) Older patients may develop persistent stiffness, arthralgia, and joint effusions for several years, especially in HLA-B27 patients. Chronic inflammatory joint symptoms were observed in up to 50% of adult cases, and after two years in some outbreaks (4, 5). It is typically a self-limited illness and is rarely fatal.

Previous studies have shown that a combination of fever and polyarthralgia had the best sensitivity and specificity at 84% and 89%, respectively, and correlated with the correct classification 87% of individuals with serologically confirmed chikunguya virus infection.

Table 2: Presenting symptoms of chikungunya infection and differential diagnosis

Common sympoms	Rare symptoms	Differential diagnosis
Sudden onset of fever Severe polyarthralgia, mainly involving distal joints Headache, back pain, myalgia Rash (50% of cases)	Neurologic (meningoencephalitis, encephalopathy, seizures, Guillain-Barré syndrome, paresis, palsies & neuropathy) Ocular (optic neuritis, iridocyclitis, episcleritis, retinitis & uveitis) Dermatologic (photosensitive hyperpigmentation, intertriginous aphthous-like ulcers & vesiculobullous dermatosis) Renal (nephritis, acute renal failure) Other (bleeding dyscrasia, pneumonia, respiratory failure, hepatitis, pancreatitis, syndrome of inappropriate secretion of antidiuretic hormone (SIADH) & hypoadrenalism) (6).	Symptoms of chikungunya virus infection can be clinically indistinguishable from dengue fever. Co-infection of chikungunya virus and dengue fever has been reported. Other acute febrile illnesses similar to chikunguny avirus including: O'nyong-nyong virus infection, Sindbis virus infection, leptospiroris, and post-infection arthritis (11, 12).

Investigation

Suspected cases of chikungunya virus should be discussed with local public health authorities who can help arrange testing through provincial or territorial public health laboratories. The National Microbiology Laboratory (NML) is currently the only laboratory in Canada with the capacity to test for chikungunya virus and will provide support to the provinces and territories by carrying out diagnostic procedures for documenting infections by chikungunya virus. NML can also provide training to staff in provincial public health laboratories so that they have the capacity to do their own testing for chikungunya virus.

The laboratory testing criteria for identifying cases include viral isolation, detection of viral RNA, and presence of viral specific IgM or IgG / neutralizing antibody. Viral isolation and RT-PCR can be used to detect virus or viral RNA in serum or blood samples collected within 7 days of symptom onset. IgM antibodies are detectable in in serum samples collected 5-7 days post onset.

Testing for chikungunya virus should be considered every time a suspect dengue cases is tested to rule out or identify co-existant disease.

Treatment

There is no specific treatment and supportive care, such as fluids, analgesia and NSAIDs, with rest is indicated during the acute symptoms. Patients with severe joint pain can be treated with narcotics or short-term corticosterioids. Mortality is rare and recovery without sequalae is expected in most cases. Occasionally, arthralgia can persist for months to over a year (6, 7).

Reporting

Chikungunya virus and dengue are not nationally notifiable diseases in Canada but detecting and reporting this disease are very useful in tracking its reach. It is recommended that cases diagnosed with chikungunya virus be reported to local public health authorities, who can report to provincial/territorial health authorities, who can in turn report nationally. The Public Health Agency of Canada can in turn report to PAHO/WHO.

Conclusion

Clinicians and public health professionals in Canada should be on the alert for sporadic cases of chikungunya virus in patients who present with fever and arthralgia after a stay in an affected Caribbean island.

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Summary

RECOMMENDATIONS FOR ROTAVIRUS IMMUNIZATION PROGRAMS

Canadian Immunization Committee*

BACKGROUND

Rotavirus is a common cause of gastroenteritis in children and can vary from asymptomatic to severe disease. Based on scientific evidence, the National Advisory Committee on Immunization (NACI) recommends rotavirus vaccine in infants for the prevention of this common viral gastroenteritis. The Canadian Immunization Committee (CIC) considered the programmatic issues of this vaccine and its appropriateness for inclusion in provincial and territorial routine immunization schedules. This document is a brief summary of the full CIC rotavirus vaccine statement. (1)

APPROACH

A Task Group of the CIC considered the burden of illness, vaccine safety and efficacy, cost-effectiveness, acceptability and feasibility, and ethical and legal considerations. It then made recommendations on a universal rotavirus vaccine program, an evaluation strategy and future research questions.

FINDINGS

Rotavirus is a common cause of gastroenteritis in children and can have serious sequelae, especially for those less than 2 years of age. In Canada, 1 in 7 children with rotavirus will seek health care, 1 in 20 will visit an emergency department or be hospitalized, and 1 in 62 will be hospitalized. Two oral rotavirus vaccines approved for use in Canada, RotaTeq® and Rotarix™, are both effective and safe against the common serotypes. Intussusception rarely occurs following immunization, and may also occur with infection. A careful safety evaluation has concluded that the benefits of rotavirus vaccine outweigh this risk. A systematic review of cost-effectiveness studies suggested that these vaccines are cost-effective even when herd immunity is not considered. Rotarix™ was found to be more cost-effective than RotaTeq® in the Canadian studies. Acceptability studies have found that parents like the fact that rotavirus vaccine is oral and effective at preventing severe disease and would rely on physician recommendation regarding its use. Rotavirus vaccination is feasible as it fits well into the current routine immunization schedule.

RECOMMENDATIONS

The CIC supports the routine use of rotavirus vaccines in infants without contraindications based on the recommendations of NACI, Canadian studies demonstrating its cost-effectiveness and Canadian studies indicating a high degree of acceptability and feasibility. An evaluation framework for rotavirus immunization programs is recommended to:

1. monitor the burden of disease in Canada;
2. assess severity of infections;
3. track vaccine coverage in the target population; and
4. monitor vaccine safety.

Additional identified areas of research include uptake studies, assessing herd immunity and the use of rotavirus vaccine in premature infants.

REFERENCE

1. Canadian Immunization Committee (CIC). (2013). Recommendations for Rotavirus Immunization Programs.

* The Canadian Immunization Committee (CIC) provides operational and technical advice related to immunization policies and programs in Canada. CIC consists of representatives from provincial and territorial jurisdictions, the National Advisory Committee on Immunization (NACI), the American Advisory Committee on Immunization Practices (ACIP) and Health Canada's Biologics and Genetics Therapies Directorate (BGTD), Marketed Health Products Directorate (MHPD), and First Nations and Inuit Health Branch.

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Summary

RECOMMENDATIONS FOR VARICELLA TWO-DOSE IMMUNIZATION PROGRAMS

Canadian Immunization Committee*

BACKGROUND

One-dose varicella immunization programs began across Canada in the early 2000s. This decreased serious complications, but breakthrough disease was observed, likely due to primary vaccine failure and waning immunity. Based on scientific evidence, the National Advisory Committee on Immunization (NACI) now recommends a two-dose schedule. The Canadian Immunization Committee (CIC) considered the programmatic issues of this vaccine and the appropriateness of two doses for inclusion in provincial and territorial routine immunization schedules. This document is a brief summary of the full CIC two-dose varicella vaccine statement. (1)

APPROACH

A Task Group of the CIC considered the burden of illness, vaccine safety and efficacy, cost effectiveness, acceptability and feasibility, and ethical and legal considerations. It then made recommendations on a two-dose varicella vaccine program, an evaluation strategy and future research questions.

FINDINGS

Between 1995 and 2005, there was an increase in the proportion of varicella cases with a previous history of immunization. By 2005, the proportion of immunized cases 1 year of age or older ranged from 57% to 64%. Immunized children typically have milder disease with few lesions, shorter duration of illness and lower incidence of fever. A two-dose program has been shown to have significantly higher vaccine efficacy rates than one dose. There may be a slightly elevated risk of benign febrile seizure when taking the combination vaccine compared to administering MMR + varicella vaccine separately; however, a Canadian study found no statistically significant risk. Therefore, larger post-licensure studies may be needed to document if there is any increase in febrile seizure rates with a combination vaccine. The sensitivity analysis of an unpublished cost-effectiveness study of one- and two- dose varicella immunizations demonstrate cost-effectiveness of a two-dose immunization schedule under many model and parameter assumptions. Implementing a second dose of varicella in grade 4 was shown to be more cost effective than implementing a second dose at 18 months. However, there is a need for more analysis on the economics of chickenpox and shingles, and to understand the benefits of one approach over another for a two-dose program. Acceptability of a second dose program is likely to mirror that of the single dose program.

RECOMMENDATIONS

The CIC supports the routine use of a 2-dose varicella vaccine schedule on a voluntary basis based on the recommendations of NACI, initial evidence for cost-effectiveness, and anticipated acceptability. Each jurisdiction can decide on whether, when and how to implement a second dose program. An evaluation is required:

1. to monitor the changing epidemiology of varicella and herpes zoster infections in both children and adults;
2. to assess the best timing of the second dose, its effectiveness and cost-effectiveness;
3. to track vaccine coverage; and

4. to monitor vaccine safety especially with respect to febrile seizures.

Research is needed to assess the length of protection, the effectiveness of catch-up programs, and the interchangeability of different varicella vaccines.

REFERENCE

1. Canadian Immunization Committee. (2014). Recommendations for Varicella Two-Dose Immunization Programs.

***** The Canadian Immunization Committee (CIC) provides operational and technical advice related to immunization policies and programs in Canada. CIC consists of representatives from provincial and territorial jurisdictions, the National Advisory Committee on Immunization (NACI), the American Advisory Committee on Immunization Practices (ACIP) and Health Canada's Biologics and Genetics Therapies Directorate (BGTD), Marketed Health Products Directorate (MHPD), and First Nations and Inuit Health Branch.

What's new

Emerg Inf Dis Feb 2014 Investigation of Inhalation anthrax case. United States. Griffith J, Blaney D, Shadomy S,Lehman M, Pesik N, Tostenson S, Delaney L, Tiller R, DeVries A, Gomez T,Sullivan M, Blackmore C, Stanek D,Lynfield R, and the Anthrax Investigation Team. http://wwwnc.cdc.gov/eid/article/20/2/13-0021_article.htm

A 61 year old man developed anthrax likely due to inhalation of spore-contaminated soil after travelling through 4 states in the US. (pre-print)

Eurosurv Jan 2014 Conclusions of the fourth CONSISE international meeting. Van Kerkhove M, Wood J, on behalf of CONSISE. http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20668

The Consortium for Standardization of Influenza Seroepidemiology has developed study protocol templates to evaluate the seroprevalence of seasonal, pandemic and zoonotic influenza viruses in specific human populations and standardised the international serology laboratory response to a new emerging influenza virus. http://consise.tghn.org/

Useful links

Rotavirus vaccine. National Advisory Committee on Immunization. Canadian Immunization Guide Part 4. 2012. http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-rot-eng.php

Varicella vaccine National Advisory Committee on Immunization. Canadian Immunization Guide Part 4. 2012. http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-vari-eng.php