

09/01/10

New Brunswick Disease Watch Bulletin

Office of the Chief Medical Officer of Health

Introduction:

Welcome to the 5th Disease Watch bulletin for 2010. In this bulletin we outline some key changes to the eligibility for the influenza vaccination and the priority groups for improved influenza vaccination coverage in New Brunswick. The influenza vaccination campaign will commence on October 18, 2010. Other articles provide an update on Legionnaires' disease after the recent notification of a case due to the uncommon "soil type" L, longbeachae, information on the importance of the post-partum follow up of gestational diabetics and an item on the emergence of a new multi resistance bacterial gene associated with medical tourism. As always, I welcome feedback to Paul.VanBuynder@gnb.ca

Priority Target Groups for Influenza Vaccination in 2010

The pandemic vaccination campaign in New Brunswick was a dramatic success particularly in vaccinating difficult to reach, but high-priority sub-groups. Over 80% of pregnant women were vaccinated against the pandemic virus, over 85% of young children and 153 % of health care workers (*a figure probably elevated by loose definitions at a time when health care workers were offered priority access*).

This year, the pandemic virus strain will be in the seasonal influenza vaccine. Protection will be available against pandemic H1N1 as well as the predicted seasonal H3N2 and seasonal influenza B strains most likely to arrive in Canada. It is hoped to now build on the success of the pandemic campaign to improve influenza vaccination in groups traditionally failing to access it in significant numbers.

Pregnant Women

Public opinion research conducted after the pandemic vaccine campaign identified the primary care provider as the critical factor in determining

whether pregnant women accessed the vaccine. Despite mixed messaging regarding the safety of adjuvanted vaccine in pregnancy and when to prioritize pregnant women, obstetric care providers in New Brunswick sent a strong message about the risks of pandemic influenza to pregnant women and their patients responded to the advice. The research found that pregnant women vaccinated themselves because:

- They were told about the severity of the disease for pregnant women.
- They had a desire to protect themselves and their unborn child.
- They had received advice about the importance of vaccination from their care giver.
- Sufficient vaccination clinics were available to make accessing vaccine relatively simple.

Seasonal influenza has been shown consistently to similarly adversely effect pregnant women particularly in the latter stages of pregnancy. Pregnant women are much more likely to have severe illness and to be hospitalized. Despite these facts and recommendations by the US CDC for over a decade for pregnant women to be vaccinated, seasonal influenza vaccine coverage rates in surveys have been as low as 14% and last year, even with the heightened awareness, seasonal influenza vaccine coverage was only 50% for NB pregnant women.

There appears to be less emphasis placed on seasonal vaccine by obstetric care givers and greater difficulty accessing seasonal vaccine which is usually not available in obstetric offices. This year, the NB Department of Health is appealing to all medical practitioners involved in antenatal care, to ensure that pregnant women receive a strong recommendation to access seasonal vaccine and that obstetric care providers are aware of where influenza clinics are available in their area so they can appropriately direct their patients.

No vaccine currently exists for children under the age of six months but, a recent study showed increased protection for these very high risk individuals if their mother was vaccinated during pregnancy. Eligibility for free vaccine in New Brunswick now extends to the families of young children and pregnant women. Please advise your pregnant patients that their whole family is entitled to free vaccine and should access it to increase the protection for the newborn.

Practice Points

- A recommendation by an obstetric care giver is a key factor in encouraging pregnant women to seek out influenza vaccination;
- Pregnant women should be advised that their whole family should be vaccinated in order to protect the newborn and that vaccination for this group is free;
- Obstetric care givers should be aware of the available local influenza clinics in order to provide information for their patients.

Health Care Workers

Reviews of health-care worker coverage for influenza vaccination consistently estimate coverage at below 50% of those eligible.

Health-care workers particularly those in regular contact with vulnerable individuals, the elderly in long term care facilities, and, the immune-suppressed in acute care institutions are a potential source of transmission of influenza infection to these patients. It is an ethical responsibility for these health-care workers to vaccinate themselves against influenza in the same way that neonatal intensive care staff should ensure they have had appropriate pertussis vaccinations.

In some jurisdictions, health-care worker vaccination has been made mandatory under legislation in order to protect the patients they come in contact with.

Most hospitals and health facilities provide influenza vaccine through staff clinics free of charge to staff. Previous studies have shown however, that providing free vaccination in itself is insufficient to attract health staff and a number of incentives are being explored to encourage improved coverage. These incentives will include having vaccine available in the ward at different times of the day so that night shift staff can access vaccine when returning to the hospital and a marketing campaign to stress the importance of vaccination.

While programs are being developed to assist acute care institutions, support is needed to ensure high vaccine uptake in long term facilities.

Many primary care practitioners in New Brunswick are currently engaged in looking after the elderly who have a high risk or severe

complications from influenza infection in a variety of care settings. These primary care practitioners have worked hard to ensure that the coverage of patients in these institutions is usually over 80%. We now appeal to these doctors to work with the institutions they visit to ensure that similar coverage occurs in the staff as well as the patients.

Due to a combination of immune-senescence and viral drift influenza vaccination is often much less effective in the very elderly. Ensuring all staff with regular patient contact are vaccinated is critical to protecting these individuals.

Practice Point

- Vaccination of health care workers is an important protection for the vulnerable in a range of hospitals and other care settings. This is particularly important in long-term care facilities. Primary care practitioners are encouraged to ensure patients and staff in these facilities access influenza vaccine in a timely fashion.

The H1N1 influenza pandemic is officially over and so is pre-loading of vaccine in syringes. Pre-loading syringes was acceptable during H1N1 mass immunization clinics because:

- stability data on the H1N1 vaccine in the syringe was known;
- professional accountability for pre-loaders and administrators of vaccine was established prior to the commencement of mass clinics; and,
- protocols were implemented to ensure the cold-chain was maintained.

Pre-loading syringes is discouraged in a routine clinic setting because of the:

- uncertainty of the vaccine stability in syringes;
- risk of contamination; and,
- increased potential for vaccine administration errors and vaccine wastage.

Ref: The Canadian Immunization Guide 2006, 7th Edition, page 39

The risk of developing Type 2 diabetes in women who had gestational diabetes

Gestational Diabetes Mellitus (GDM) can occur in non-diabetic women during pregnancy, usually in the fifth or sixth month. Glucose tolerance often then returns to normal after delivery. In New Brunswick, gestational diabetes occurs in about four per cent of pregnancies, with an average of 280 cases per year recorded.

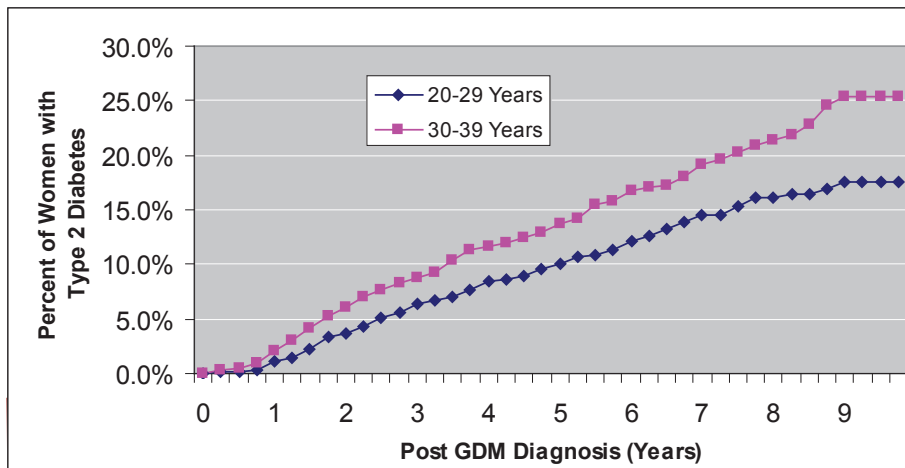
Women with GDM show, however, a substantially higher risk of developing Type 2 diabetes later in life. Five years after being diagnosed with GDM, 10 per cent of women who were 20 to 29 at the time of diagnosis with GDM and 14 per cent of women 30 to 39 developed Type 2 diabetes. Nine years after being diagnosed with GDM, 18 per cent of the women 20 to 29 and 25 per cent of women 30 to 39 were living with diabetes.

Recognition that gestational diabetes places women at a higher risk of developing Type 2 diabetes later in life is an important step in reducing diabetes. Family doctors and specialists can play a key role in advising women with gestational diabetes about the risks, consequences and prevention of developing Type 2 diabetes.

Practice Point

- GDM is a strong marker for subsequent development of diabetes.
- Post-partum: all GDM patients should be followed up with:
 - A formal glucose tolerance test.
 - Advice about the risks of developing diabetes.
 - Advice about nutrition and exercise to decrease the risk.

Percentage of women 20 to 29 and 30 to 39, in New Brunswick, diagnosed with gestational diabetes who developed Type 2 diabetes within nine years, 1998 to 2007.



Emergence of organisms with new antibiotic multi-resistance patterns

Bacteria from clinical and non-clinical settings are becoming increasingly resistant to conventional antibiotics. Previously, concern centered on Gram-positive bacteria, particularly MRSA and VRE. Now, however, multidrug resistant Gram-negative bacteria are emerging as a risk to public health. Not only is the increase in resistance in Gram-negative bacteria occurring faster than in Gram-positive bacteria, but there are also fewer new and developmental antibiotics active against these Gram-negative bacteria.

The recent increase in resistance in Gram-negative bacteria is mainly due to a mobile element – a gene blaNDM-1 that jumped from the chromosome of its natural hosts to plasmids that can readily spread between bacteria. This gene blaNDM-1 is coding the unique enzyme - New Delhi Metallo-beta-lactamase (NDM-1) that belongs to a Carbapenemase class of enzymes that can hydrolyze all Carbapenem antibiotics (except aztreonam), rendering them ineffective. Carbapenems (imipenem, ertapenem, meropenem, doripenem) are a class of beta-lactam antibiotics with a broad spectrum of activity against gram-positive, gram-negative and anaerobic bacteria.

This new mechanism, NDM-1, is linked to receipt of medical care in India or Pakistan, where it is common among enteric bacteria. So far, NDM-1 has been isolated from *Klebsiella pneumoniae*, *Escherichia coli*, *Citrobacter freundii*, *Enterobacter cloacae*, and *Morganella morganii*. *Klebsiella*

pneumoniae is already causing a major problem in the USA, Greece, Turkey and Israel. Widespread presence of NDM-1-positive bacteria in the UK prompted the Department of Health to issue a National Resistance Alert 3 notice in July 2009. Carbapenem resistance in Enterobacteriaceae had also caused concern in Sweden, Australia and the Netherlands. Two cases of NDM-1 were reported in Canada so far, one in Alberta and one in British Columbia. Treatment of infections caused by these pathogens poses a serious challenge as these infections are resistant to all commonly used antibiotics.

Unprecedented human air travel and migration allow bacterial plasmids and clones to be transported rapidly between countries and continents. Much of this dissemination is undetected, with resistant clones carried in the normal human flora and only becoming evident when they are the source of infections. In order to prevent transmission of bacteria possessing NDM-1 in Canada, PHAC is alerting clinicians to be aware of NDM-1-producing Enterobacteriaceae in patients who have recently received medical care in India or Pakistan. Clinicians should specifically inquire about this risk factor when carbapenem-resistant Enterobacteriaceae are identified.

Current CDC (USA) infection control guidance for NDM-1-producing isolates includes recognizing carbapenem-resistant Enterobacteriaceae when cultured from clinical specimens, placing patients colonized or infected with these isolates in contact precautions, and in some circumstances, conducting point prevalence surveys or active-surveillance testing among other high-risk patients. Laboratory identification of the carbapenem-

resistance mechanism is not necessary to guide treatment or infection control practices but should instead be used for surveillance and epidemiologic purposes. Infection control interventions, aimed at preventing transmission, should be implemented when NDM-1-producing isolates are identified.

Legionnaires' disease

A case of *L. longbeachae* was detected in the Saint John region in June 2010. Infections with this *Legionella* species, *L. longbeachae*, are associated with gardening and use of potting soil or compost and are particularly common in Australia and Japan. Few cases are reported in New Brunswick.

Legionnaires' disease was first reported in 1976. An outbreak of a mysterious pneumonic disease occurred at a convention of the American Legion in Philadelphia, PA, that sickened 221 individuals and caused 34 deaths. The identified causal agent, previously unidentified, was subsequently named *Legionella*. A clue to the ultimate epidemiology of the organism was found when the only non American Legion member affected was the air conditioner repairman there to fix the coolers. Additional investigation linked this pathogen to previous outbreaks as far back as 1947.

Legionella is a Gram-negative bacterium, and it typically causes legionellosis or legionnaire's disease as well as the milder form, pontiac fever. The most common causative *Legionella* species, observed in New Brunswick and throughout the world, is *Legionella pneumophila*, an aquatic organism that thrives in temperatures between 25 and 40 °C with a growth facilitated by stagnation, scale and sediment. *Legionella* is very common in many settings with more than 50 species and 70 subtypes documented. It has been identified in many countries and continents, including North America, Europe, Australia, Africa and South America. Cases are observed primarily in the summer and fall. Increasingly it is recognized as a significant cause of both nosocomial and community acquired pneumonia; a situation likely to increase with increasing numbers of immune-compromised persons in the community.

Legionella originates from a variety of natural and man-made aquatic environments, including hot water

tanks, air conditioning cooling towers, humidifiers, spas, swimming pools and hot tubs. *Legionella* will attach to any surface submerged in water to form a slime-like layer called biofilm. *Legionella* appear to survive in nutritionally deficient environments by parasitizing amoebae found in soil and water. These organisms phagocytize the *Legionella* bacteria that then multiply intracellularly. Besides observing strictly aquatic habitats, investigators have recovered the organism in mud, soil, potting mixtures and pine sawdust.

Modern inventions and lifestyle have provided new habitats for *Legionella*. Because *Legionella* can withstand the chlorine level achieved by most water treatment facilities, it may be present in tap water and has been cultured from showerheads and water faucets.

The primary mode of transmission of *L. pneumophila* is believed to be by inhalation of waterborne droplets containing the bacteria into the respiratory tract by way of aerosols. Person-to-person transmission has not been documented.

Clinical symptoms of *Legionella* infection occur two to 10 days after exposure. Patients with legionnaires' disease experience headache, fever and chills, myalgia and a progressive pneumonia. Other symptoms include abdominal pain and diarrhea, loss of appetite and a general sense of not feeling well. The spectrum of legionnaires' disease is broad and

ranges from mild cases with no or few symptoms to a rapidly progressive pneumonia and sometimes death. Legionnaires' disease carries a case-fatality rate of five to 30 per cent with prompt treatment directly affecting outcome. Pontiac fever has an attack rate as high as 95 per cent and a very short incubation period. Patients report influenza-like illness with fever, muscle pains, and cough, but no signs of pneumonia show up on X-rays. Recovery from this form is within five days without treatment.

The illness most often affects middle-age and the elderly, and those who smoke cigarettes, have diabetes and/or chronic lung disease.

Legionella can be community acquired, nosocomial or travel related. Many travel related outbreaks have been observed among cruise ship passengers or persons staying overnight in large hotels. Risk factors for hospital-acquired legionnaires' disease include recent surgery, intubation, mechanical ventilation, aspiration, presence of nasogastric tubes, and the use of respiratory therapy equipment. The most susceptible hosts are those who are immunocompromised, organ transplant recipients and those receiving corticosteroid treatments. Compared to hospital-related cases, community-acquired infections have more severe clinical manifestations, probably due to the delay in diagnosis and concomitant delay in treatment.

Legionellosis national case definition:

Confirmed case:
Laboratory confirmation of infection from respiratory secretions, lung tissue, pleural fluid or other normally sterile fluids

- Significant (e.g. fourfold or greater) rise in *Legionella* species IgG titre between acute and convalescent sera
- IgG titre > 1:128 against *Legionella* species
- Demonstration of *L. pneumophila* antigen in urine

Probable case:

Clinical illness with demonstration of *Legionella* species DNA.

There is no vaccine currently available for Legionnaires' disease.

