

New Brunswick Disease Watch Bulletin

Office of the Chief Medical Officer of Health

Introduction:

Welcome to Disease Watch 3. In this edition, we update meningococcal disease, cases of which peak at about this time of year, often with serious consequences. Meningococcal C vaccines have reduced the incidence of meningococcal disease significantly, but we await further development on meningococcal B vaccines before we can achieve greater reductions. We also update a small increase in pneumococcal disease in the province and introduce our new provincial medical officer of health, Dr. Alexander Doroshenko. As always, we welcome comments to paul.vanbuynder@gnb.ca.

Meningococcal Disease

Meningococcal Disease is a contagious bacterial disease caused by aerobic gram-negative diplococcus *Neisseria meningitidis*. Thirteen serogroups of *N. meningitidis* have been identified. Most invasive disease is caused by serogroups A, B, C, Y and W-135.

N. meningitidis colonizes mucosal surfaces of the nasopharynx and is transmitted through prolonged direct contact with large droplet respiratory secretions from the patients or asymptomatic carriers. Nasopharyngeal carriage induces serogroup-specific immunity of variable duration. There is no maternal immunity.

In susceptible individuals, meningococcal infection may become invasive and manifest itself as meningitis and/or septicemia or other syndromes (for example, pneumonia, orbital cellulitis and septic arthritis). Risk groups include infants and young children, refugees, household contacts of case patients, military recruits, college freshmen who live in dormitories, microbiologists who work with isolates of *N. meningitidis*, patients without spleens, people exposed to active and passive tobacco smoke, and international travellers.

The disease generally occurs one to 14 days after exposure. People are usually

considered infectious from seven days before onset of symptoms to 24 hours after onset of effective treatment. The incubation period lasts on average four days (range: two to 10 days).

The case fatality rate is 10 to 14 per cent; up to 20 per cent of survivors can develop persistent neurological defects, including hearing loss, speech disorders, loss of limbs, mental retardation, paralysis and skin scarring.

Index case management

As soon as IMD is suspected, appropriate antibiotic treatment must be started. The patient must be immediately transferred to a hospital.



Could it be IMD?

Invasive Meningococcal Disease (IMD) occurs year-round with cases usually peaking in Canada during the winter or spring. The last IMD outbreak in New Brunswick was in the Moncton area in May 2005. Clinicians are urged to be on the look-out for patients presenting the following symptoms:

Early symptoms:

- Leg pain
- Cold extremities
- Abnormal skin colour

* frequently seen in the first 12 hours of meningococcal disease

Followed by:

- High fever
- Headache
- Stiff neck
- Vomiting
- Nausea
- Photophobia
- Confusion
- Drowsiness or confusion
- Irritability
- Excessive crying in young children
- Small purplish rash

Pre-hospital antibiotic therapy can halve the case fatality rate, and it should not be delayed while awaiting results of diagnostic tests. Several antibiotic choices are available (ceftriaxone, cefotaxime, benzylpenicillin) and chemoprophylaxis of contacts (ceftriaxone, ciprofloxacin, rifampin). In addition to therapeutic antibiotics, the case should receive chemoprophylaxis before hospital discharge unless the infection was treated with an antibiotic in nasopharyngeal eradication of *N. meningitidis*.

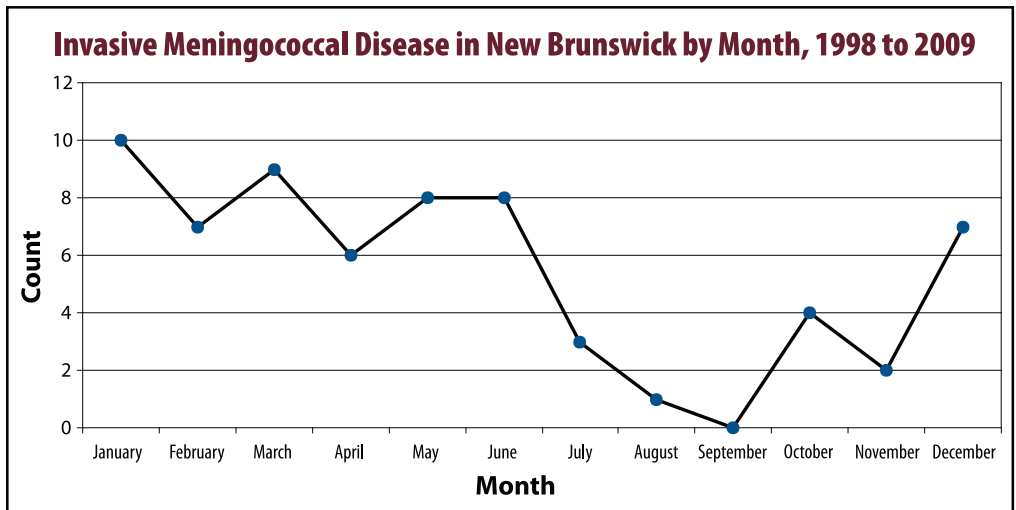
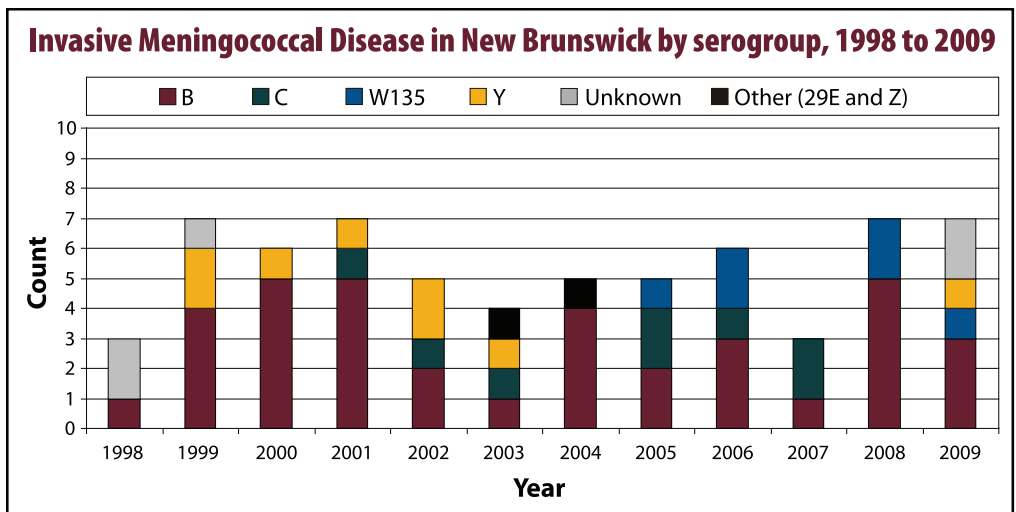
Contact management

As close contacts of an IMD case during the infectious period are at increased risk of secondary disease, chemoprophylaxis should be offered to them regardless of their immunization status. Chemoprophylaxis should be administered within 24 hours of case identification but can be given up to 10 days after the last contact with an infectious case.

Diagnosis

Initial diagnosis of IMD can be made by clinical examination and confirmed by tests:

Test name	Specimens to take	Utility
Gram stain	CSF, joint fluid or other sterile site, or skin lesion.	Rapid results. Positive result confirms diagnosis. Sensitivity in CSF 65 per cent; from skin lesions 30 per cent to 70 per cent.
Culture	CSF, blood, joint fluid or other sterile site, or skin lesion	Results in 24 to 48 hours. Positive result confirms diagnosis. Sensitivity in CSF 95 per cent - if no prior antibiotics; in blood 50 per cent - if no prior antibiotics, five per cent if prior antibiotics
PCR	CSF, blood	Positive result confirms diagnosis. Can determine serogroup without a positive culture. Sensitivity 96 per cent, specificity up to 100 per cent.
Serology	Blood	Single positive IgM or rising convalescent titer to outer membrane protein antigen confirms diagnosis. Sensitivity in adults and older children >97 per cent.



In 2006, there were:

- 210 meningococcal cases diagnosed in Canada; six from New Brunswick;
- 113 cases caused by serogroup B: three from New Brunswick;
- 43 cases in serogroup C; one from New Brunswick;
- 27 cases in serogroup Y; none from New Brunswick;
- six cases of serogroup W-135; two from New Brunswick; and
- two cases of serogroup A; none from New Brunswick.

The remaining 19 cases were due to other serogroups. New Brunswick averages fewer than 10 IMD cases annually.

Disease surveillance

Both confirmed and probable cases of IMD are nationally notifiable in Canada. As per the New Brunswick Public Health Act, IMD should be reported to a medical officer of health orally within 24 hours of identification, followed by a written report within

one week after identification. Early case recognition and rapid reporting of IMD is important to ensure optimal treatment of the index case and prevention of secondary cases through timely initiation of chemoprophylaxis of close contacts.

Immunization

Three meningococcal vaccines are used in New Brunswick in the publicly funded program. Meningococcal conjugate C vaccine (Menjugate® or Neis Vac®) is provided routinely to infants at 12 months of age while students in Grade 9 receive meningococcal conjugate ACYW-135 (Menactra®) vaccine through school-based programs.

It is recommended that individuals at increased risk of IMD, including those with functional or anatomic asplenia, or those with complement, properdin, or factor D deficiency, receive the quadrivalent meningococcal conjugate or polysaccharide (Menomune®) vaccine, depending on their age.

All three vaccines are used in outbreak management. Travel vaccines are not provided through the publicly funded programs, so travelers should consult a travel medicine clinic for information on what meningococcal immunization may be required.

Developing vaccines for group B disease has been difficult because the polysaccharide capsule resembles a molecule expressed in the developing brain and the immune system does not produce a good antibody response against it. However, Novartis and Wyeth have developed a Meningococcal B vaccine that uses proteins found on the surface of most group B bacteria strains. Although they have used very different approaches to develop the vaccines, they both contain a similar protein as part of the vaccine. A new meningococcal conjugate ACYW-135, Menveo® has recently been approved by the Biologics and Genetic Therapies Directorate (BGTD).

Introducing Dr. Alex Doroshenko

The Office of the Chief Medical Officer of Health is pleased to announce the appointment of Dr. Alexander Doroshenko as the new provincial medical officer of health.

Dr. Doroshenko will work across the Office of the Chief Medical Officer of Health in Fredericton. His responsibilities will include communicable disease control and prevention; and infectious diseases epidemiology and surveillance.



After obtaining a medical degree, Dr. Doroshenko undertook further public health study in the United States. He is trained in pediatrics and public health medicine in the United Kingdom, where he worked as a consultant medical epidemiologist with the UK Health Protection Agency. He moved to Canada in 2007 and most recently worked at the Canadian Centre for Vaccinology, IWK Health Centre in Halifax, as a fellow in pediatric infectious diseases.

Dr. Doroshenko is an author of a number of scientific articles on infectious disease epidemiology.

Dr. Doroshenko is based in Fredericton and may be reached at 506-444-3044, alex.doroshenko@gnb.ca.

Prevnar 13 and Pandemic H1N1 Vaccine

Prevnar 13 will replace Prevnar 7 in the routine childhood immunization program on July 1st. Please order your July requirements by June 21st. Information regarding your remaining Prevnar 7 supply will follow.

Pandemic H1N1 Vaccine: Immunization against the H1N1 influenza virus has now been completed. Immunization providers who have any unused H1N1 vaccine are requested to contact the centre they received vaccine from to arrange for its return. Thank you

Announcing the NIAW poster competition winners

This year, Grade 6 students throughout the province participated in a poster competition to promote immunization as part of National Immunization Awareness Week, April 26 to May 1.

All posters entered in the competition were of a very high standard, and it was difficult to pick a winner. Choosing the provincial winner ended in a tie. The winner from Fredericton was Gabrielle Dupuis, who attends École Sainte-Anne, and the winner from Campbellton was Darien Driscoll, who attends Jacquet River School, Belledune. They each received an Ipod Touch, and their schools received a Touchscreen computer and immunization literature for the schools library.

The zone winners from Moncton, Saint John, Edmundston, Bathurst and Miramichi each received an Ipod Nano.



Fredericton Zone 3 - Michel Chenard - Art Instructor École Ste-Anne School Erica Jomphe - Honourable Mention (pink) Gabrielle Dupuis (first place for Fredericton area and 1st place Provincially; Dr. Cristin Muecke, Regional Medical Officer of Health; Kim Greechan. RHA B Public Health Nurse and Immunization Coordinator



Campbellton Zone 5 - Thérèse Maltais Aubé, Zone 5, RHA A Public Health Nurse and Immunization coordinator, Darien Driscoll, winning competition student from Jacquet River School, Haley Taylor, Grade 6 teacher, Gordon MacDougall, Jacquet River School Principal and Pauline Godbout-Santerre, Zone 5, RHA A Public Health Nurse and School District 5 Healthy Learner Program.

Invasive Pneumococcal Disease (IPD) update

There were 28 cases of invasive pneumococcal disease (IPD) reported in New Brunswick in the first quarter of 2010. This was the highest quarterly number since 2007. The quarterly rate of IPD for New Brunswick was 3.74 per 100,000 population. The Saint John region had the highest number of cases and the highest quarterly rate in New Brunswick (10 cases and 5.71 per 100,000, respectively). Cases of IPD were over-represented in people 60 years and older, with the provincial quarterly rate among individuals older than 60 years being 8.88 per 100,000. Three cases of serotype 7F IPD and two cases of 19A serotype were reported in the Saint John region. This information emphasizes a need for immunization of elderly people (older than 65) and adults of any age with chronic conditions (as noted in the Canadian Immunization Guide and provided through the New Brunswick publicly funded immunization program for individuals at increased risk) with 23-valent polysaccharide pneumococcal vaccine (Pneumovax).