Trends in meningococcal disease in Western Australia (WA)

Welcome to the Christmas edition of Disease WAtch with a focus on emerging issues in meningococcal disease. The number of cases of meningococcal disease in WA has stabilised over the last 3 years at around 50 cases. (see table). While the number of cases is stable, there has been a decline in the number of serotype C cases, reflecting the rollout of the vaccine against this type. The male preponderance (average rate ratio1.4:1) remains, as does the excess rate in Indigenous children. This bulletin includes new information about national deliberations, some exciting news about a possible serotype B vaccine, and also some news about the enhancement of genosubtyping capacity. This new work will help identify clusters and aid future discussions about transmission. Early in the New Year we will be looking for feedback about the revised Disease WAtch format. We hope you have found it useful.

<table>
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<tr>
<th>Year</th>
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<th>Ethnicity</th>
<th>Serotype</th>
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<tr>
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* includes 36 race not allocated in 2000-2002;   # Non-typeable includes 47 data not recorded

Transmission of meningococcal disease

Recently in the eastern states, there have been some high profile coronial investigations into meningococcal deaths. These investigations have made a number of recommendations, and have led to further work by the Communicable Disease Network of Australia (CDNA) Meningococcal Disease Working Group (MDWG). It is anticipated that revised guidelines for the management of meningococcal disease will be published in early 2007. In the interim the following are key outcomes of recent determinations.

- **Clinical Features**: Leg pain, cold extremities and abnormal skin colour are frequently seen in the first 12 hours of meningococcal disease, whereas the classic features (haemorrhagic rash, meningism, and impaired consciousness) are relatively late signs (median onset 13 to 22 hours).

- **Risk Factors**: There is a definite increased risk of further cases among the household contacts of a case of meningococcal disease, but there may also be an increased risk in child care facilities, schools or universities attended by a case, and among those in very close contact with a case after the onset of symptoms.

- There is a small but definite increased risk of transmission to health care workers. The risk is approximately 25 times the background risk of disease compared with the risk to household contacts (500 to 1200 times the background risk). Most public health policies recommended chemoprophylaxis only when there has been unprotected exposure to a case’s oronasopharyngeal secretions (for example in the performance of mouth-to-mouth resuscitation or the performance of intubation).

- There is little evidence to support the view that low level salivary contact is a means of transmission of meningococci, hence, sharing of drink bottles, cigarettes, communion cups, referees whistles, etc., does not elevate the risk enough to warrant the provision of clearance antibiotics.

- There is evidence to support the transmission of meningococci through intimate kissing.

- Clearance antibiotics given to a contact of a case are primarily aimed at eliminating the carrier state if she/he was the source of the index case’s illness. Additionally, if a close contact has recently acquired carriage from the same source as the index case, then the antibiotics would be expected to eliminate carriage and prevent potential disease. An index case is not an efficient transmitter of disease, therefore health care staff caring for patients require only a mask to be worn, and antibiotics are not recommended.
Meningococcal B vaccines – a new hope?

The successful introduction of meningococcal C conjugate vaccines in Australia has led to a dramatic reduction in meningococcal C disease. This highlights the need for an effective vaccine against meningococcal B disease, particularly in Western Australia (WA) where serogroup B now accounts for 90% of laboratory confirmed cases of meningococcal disease. Developing vaccines for group B disease has been difficult as the polysaccharide capsule resembles a molecule expressed in the developing brain, and the immune system does not produce a good antibody response against it. Other approaches have led to the development of strain specific vaccines such as the MeNZB vaccine that is being successfully used in New Zealand to deal with a particular group B strain that has caused problems for a number of years there, but is unlikely to provide protection against the other group B strains that cause disease in Australia.

Many alternative approaches have been tried with limited success, but recent advances presented at an international conference in Cairns suggest that a meningococcal B vaccine able to provide broad protection across different strains may soon be possible. Two vaccine manufacturers have developed vaccines that are now entering clinical trials in teenagers and children that use proteins on the surface of group B bacteria present on most strains. Although they have used very different approaches to develop the vaccines, they both contain a similar protein as part of the vaccine.

It is hoped that the current studies, some of which are being done here in Perth, will show that the vaccines enable the children in the trials to produce protective antibodies against a wide variety of group B strains, and potentially, other meningococcal strains as well. While both companies are in the early stage of vaccine development (Phase 1-2 trials), initial results are promising. Importantly the vaccines are being tested in both young children and adolescents, as children under 5, teenagers and young adults are at highest risk for meningococcal disease.

Recruitment is ongoing in Perth and a number of other Australian centres for both toddlers 18 to 36 months of age and children between 10 to 12 years of age who are helping to try and beat this serious disease. For further information on these studies, contact the Telethon Institute for Child Health Research’s Vaccine Trials Group on (08) 9340 8542.

Hepatitis C: Liver Biopsy Guidelines

As reported in an earlier edition of Disease WAtch (available at www.population.health.wa.gov.au/Communicable/diseasewatch.cfm), as of 1 April 2006, patients wanting to access Pharmaceutical Benefits Scheme (PBS) Schedule 100 (S100) listed hepatitis C treatments are no longer required to undertake a liver biopsy as a prerequisite for treatment. While no longer an S100 requirement, liver biopsy remains an important diagnostic tool for assessing the degree and cause of liver damage, and may benefit some patients in the long-term, as the information obtained from biopsy can assist with determining the necessity, timing and duration of treatment. Biopsy may also provide additional information to determine the risk benefit of treating those with existing co-morbidities.

WA Health’s Sexual Health and Blood-borne Virus Program (in consultation with hepatitis C treatment centres at Royal Perth, Fremantle and Sir Charles Gairdner hospitals) have produced Hepatitis C – Liver Biopsy Guidelines, enclosed with this edition of Disease WAtch. Download additional copies at www.population.health.wa.gov.au.
Genosubtyping of Meningococcal strains from Western Australia (WA)
Dr David Speers, PathWest Laboratory Medicine WA

*Neisseria meningitidis* remains a leading cause of bacterial meningitis and septicaemia around the world, including WA. Local outbreaks and clusters draw much attention, but the majority of meningococcal disease in WA is endemic, mostly due to serogroup B infection. Since the currently licensed vaccines have no activity against these serogroup B strains due to the failure to generate a protective immune response to the type B polysaccharide capsule, there has been much research effort to find other vaccine targets. The *porA* gene product, an outer membrane protein (OMP) found in all meningococci, has been studied as this protein has been shown to elicit bactericidal antibody responses. Several such vaccines incorporating this OMP have undergone human clinical trials. However, the immune response elicited, and therefore the protection offered, is specific to the antigenic type (serosubtype) of the *PorA* protein. Knowledge of the serosubtypes of the *N. meningitidis* strains that cause disease in WA is therefore important to assess the usefulness of any such vaccines.

Genosubtyping the *porA* gene has emerged as a rapid and simple typing method for the study of endemic *N. meningitidis* disease in a number of countries. This method involves the sequencing of the *porA* gene segments responsible for the antigenic determinants bound by the serosubtyping monoclonal antibodies. Genotyping provides unambiguous digital data that can be compared to results from any laboratory around the world. A website exists for the deposition of the *porA* sequences such that local strains can be compared to those found around the world.

A genosubtyping project was therefore established at the PathWest Queen Elizabeth II (QEII) Molecular Diagnostic Laboratory. All meningococcal culture or PCR positive specimens received at the QEII laboratory are included. Since 2004, almost half of the results obtained were from culture-negative cases. Although this study is ongoing, the results for the first 87 cases (75% serogroup B) have been analysed. Ten major genosubtypes (and their variants) were found, however, two genosubtypes dominated making up over 50% of all the strains. One of these two genosubtypes is the same type as that causing the ongoing epidemic of serogroup B disease in New Zealand. The less common genosubtypes appeared to vary over time and were more likely to be restricted by geographical region of WA or age of the patient.

This ongoing project will result in a library of genosubtype data from cases of endemic disease and clusters in WA, even from cases where a culture has not been obtained. This data will allow the comparison of local *N. meningitidis* strains in the context of the global epidemiology of *N. meningitidis* disease and allow investigation of possible disease clusters. It will also permit the predominant genosubtypes in WA to be compared to the antigenic component of candidate *PorA* vaccines for endemic serogroup B disease.

(A fuller version of this article is available at www.population.health.wa.gov.au/Communicable/diseasewatch.cfm.)

Syphilis alert

There has been an increase in infectious syphilis (primary, secondary and early latent) cases in men who have sex with men (MSM) in the Perth metropolitan area. Some cases are also HIV positive and are having unprotected sex with other HIV positive males after disclosing their status. The disease is being spread through unprotected oral and anal sex, with most men presenting with clinical signs of secondary syphilis or as a result of contact tracing.

Secondary syphilis may present in a variety of ways including fever, malaise, rash (on any part of the body, including the face, palms and soles), condylomata lata (may be mistaken for genital warts), alopecia and snail-track ulcers in the mouth/tongue.

Medical practitioners should offer opportunistic testing for syphilis to sexually active, MSM, HIV-positive male patients, and those who believe themselves to be at risk of a sexually transmitted infection (STI). If your patient is at risk and their first syphilis test is negative, it is worthwhile repeating the test one month, as well as three months, later.

It is possible for a chancre of primary syphilis to appear before seroconversion.

Appropriate STI testing (with consent) includes:
- First void urine for chlamydia and gonorrhoea
- Blood for syphilis, hepatitis B and HIV (consider hepatitis C if there is a history of injecting drug use or sexual practices in which exposure to blood is likely).

The recommended treatment for infectious syphilis is 1.8 g benzathine penicillin IMI.

Doctors are reminded to report all suspected and confirmed infectious syphilis cases to Communicable Disease Control by faxing a disease notification form to (08) 9388 4848. If you require telephone advice regarding syphilis, call (08) 9388 4868.
Increased risk of listeriosis in elderly and/or immunocompromised over the festive season.

Pregnancy-related listeriosis rates have dramatically reduced as a result of successful listeria campaigns. Elderly and/or immunocompromised individuals now account for more than three-quarters of listeriosis cases in WA. Of the 52 non-pregnancy-associated cases notified between 2000 and 2006, approximately 30% were being treated for cancer (mainly haematological), and the remainder were associated with a range of other immunocompromising conditions including autoimmune disorders, organ transplantation, cardiomyopathy, emphysema and renal dialysis, or were undertaking immunosuppressive treatments such as corticosteroids and chemotherapy. There was a 12% case fatality rate in the non-pregnancy-associated cases.

Interviews with patients revealed that a large proportion had consumed foods considered to be high risk for listeria and that many were not aware that their condition(s) made them more susceptible to this infection.

With the onset of the festive season, elderly and/or immunocompromised people are more likely to be exposed to listeria-risky foods, such as pre-prepared dips and salads, soft cheeses, patés, cold/smoked/ raw seafood, and left-over cold meats. Elderly and/or immunocompromised people should avoid these foods unless they are freshly cooked or heated to a steaming hot temperature.


Converting high-Listeria-risk foods to low-Listeria-risk foods

The Listeria bacteria is killed by normal cooking temperatures, so most high-risk foods (such as salami, ham, mortadella, cold chicken, cold casseroles/stews, and other leftovers including chicken, pizza and yesterday’s roast) can be made low risk for Listeria by following these instructions.

- Slice the food or put a small amount in a microwave oven, pre-heated convection oven, or in a pan on the stove.
- Reheat or cook until food is hotter than 70°C all the way through. The food must be steaming/boiling hot – too hot to eat immediately. This hot food is safe to eat now or you can cool it down in the fridge and eat it cold, providing you eat it within 24 hours. After that throw it out.
- Soft cheeses can be used in cooking if they also reach the temperatures listed above.
- Home made paté that is thoroughly cooked and consumed in less than 24 hours of cooking if stored safely in the fridge is also safe. After that time throw it out!

Erratum: Rickettsial Spotted Fever in Western Australia (WA)

Last month Communicable Disease Control sent a letter to GPs advising them to collect blood in an EDTA tube. This is incorrect. Blood for rickettsial serology, like all other serology, should be collected in a plain, clotted blood tube. Rickettsial infection is a notifiable disease in WA. Although the Disease Notification form lists typhus only, you should notify all Rickettsial infections using this form by writing “Rickettsial infection” next to the typhus box.

If you suspect rickettsial infection:
- Take an initial 10 ml of blood in a plain, clotted blood tube for rickettsia serology
- Refer to the Antibiotic Guidelines for treatment
- Refer to an infectious diseases physician for further testing or advice if required.
- NOTIFY using the disease notification form by writing "Rickettsial infection" next to the typhus box.

All the staff at WA Health’s Communicable Disease Control Directorate wish you a very safe and happy Christmas and New Year. We look forward to working with you again in 2007 and beyond.