EPI-INSIGHT

IONAD NAISIUNTA FAIRE GALAIR

Disease Surveillance Report of NDSC, Ireland

Volume 2, Issue 11, November 2001 ISSN: 1393-9548

IN THE NEWS

ANTHRAX

Anthrax is a zoonotic disease caused by *Bacillus anthracis*, a spore-forming rod, which occurs primarily in large herbivores. The reservoir of *B. anthracis* is soil and spores can remain viable for decades.[1] There have been no human or animal cases of anthrax notified in Ireland during the last 25 years.

Anthrax as a Bioterrorist Risk

Following the attacks in the US on 11th September and in the light of recent mail deliveries of anthrax spores in the US and Africa, there has been great interest and concern about anthrax as a biological weapon.

Anthrax spores are highly infective and small doses have the potential of producing considerable harm. Person to person transmission of inhalational disease does not occur. Direct exposure to vesicular secretions of cutaneous anthrax lesions may very rarely result in secondary cutaneous infection. If intentionally released, spores would most likely produce effects following inhalation. Much of our knowledge of inhalational disease comes from very rare sporadic cases and an outbreak at Sverdlovsk in Russia, in 1979, following an unintentional discharge of anthrax spores from a military research facility.[2]

Clinical Features

Human disease is potentially fatal. Anthrax can present in 3 ways:

• *Cutaneous*: follows inoculation of *B. anthracis* beneath the skin. It begins with itching at the point of contact, followed by a sore, which becomes fluid filled and over the next 2 - 6 days develops into a depressed, blackened scar. The skin form is less serious than the other forms and most people recover quickly after antibiotics are started.

• *Intestinal*: is generally due to eating infected meat. Initial signs of nausea, loss of appetite, vomiting, and fever are followed by abdominal pain, vomiting of blood, severe diarrhoea and shock. This is a very serious form of anthrax.

• *Respiratory*: is the least common (only 18 naturally occurring cases in the US during the 20th Century) but the most likely presentation following a bioterrorist attack. Mortality is about 90%. This prognosis is much improved if chemoprophylaxis can be initiated shortly after exposure. The incubation period can be 1-60 days (generally 1- 5 days). Early diagnosis is difficult and requires a high index of suspicion. There are 2 stages to the illness:

a. *Initial Phase*: Lasting hours to a few days. Symptoms are non-specific and may include fever, cough, headache, vomiting, rigors, chest and abdominal pain. Laboratory findings are non-specific. Some patients may appear to recover. The remainder progress to the second fulminant stage of the disease.

b. *Fulminant Phase*: With sudden onset of fever, dyspnoea, sweating, bacteraemia and septic shock. Stridor can develop as a result of adenopathic mediastinal compression. Up to 50% can develop haemorrhagic meningitis, with death generally following in 24-36 hours. The mortality rate is proportional to the incubation period – most fatalities occur in victims who develop symptoms within 3 days of exposure.

Diagnosis

A widened mediastinum on chest x-ray in a previously healthy individual who has symptoms of overwhelming flu-like illness is virtually pathognomic of inhalational anthrax. Detection at this stage is unlikely to be of benefit to such a patient but might lead to earlier diagnosis in others.

B. anthracis can be seen in peripheral blood smears. Culture of *B. anthracis* from blood is often only possible late in the disease.

Prevention and Control

1. *Immediate notification*: To the regional Director of Public Health of even a suspected single case of anthrax.

2. *Isolation*: Standard universal precautions for the duration of the illness. Antibiotic therapy sterilises skin lesions after 24 hours.

3. *Disinfection*: Of all discharges from lesions and dressings. Hypochlorite is the disinfectant of first choice. Spores require steam sterilisation, autoclaving or burning to effectively disinfect. Fumigation and chemical disinfection can be used for valuable equipment. Terminal cleaning (on discharge or death of patient).

4. *Quarantine*: None.

5. *Immunisation of contacts*: None.

6. *Treatment*: Penicillin is the treatment of choice for cutaneous anthrax. Tetracyclines, erythromycin and chloramphenicol are also effective. Parenteral ciprofloxacin (drug of first choice) or doxycycline for inhalational anthrax.

7. *Exposed People*:
   - No quarantine.
   - Post-exposure prophylaxis: Ciprofloxacin (or other 4-quinolones) is the drug of first choice: doxycycline is an alternative.

8. *Decontamination of exposed victim*:
   - Soap and copious showering.
   - Victim's clothes and jewellery should be removed, bagged and held for forensic/police examination.

9. *Healthcare Staff Managing Suspected Cases*:
   - Standard universal precautions.

More detailed information is available at the Department of Health and Children's website at http://www.doh.ie/publications/antrax.html

Dr Paul McKeown, NDSC

References

1. Chin J. Control of Communicable Diseases Manual. American Public Health Association, Washington. 2000.

2. Inglesby TV, Henderson DA, Bartlett JG, Ascher MS, Eitzen E, Friedlander AM, et al. Anthrax as a biological weapon: medical and public health management. Working Group on Civilian Biodefense. *JAMA* 1999; **281**(18): 1735-45.

Contents:

National Disease Surveillance Centre,
Sir Patrick Dun's Hospital,
Lr. Grand Canal Street,
Dublin 2, Ireland
Tel: +353 (0)1 661 7346
Fax: +353 (0)1 661 7347
info@ndsc.ie
www.ndsc.ie

Invasive Meningococcal Disease in Ireland 2000/2001

Introduction

Invasive meningococcal disease (IMD) is still a public health problem in developed as well as developing countries and is an important cause of morbidity and mortality. It is the leading cause of bacterial meningitis in Ireland, accounting for approximately 90% of cases. The highest rates of IMD are seen in pre-school children (<5 years) and in adolescents (15-19 years).

IMD is caused by the bacterium *Neisseria meningitidis*, consisting of a number of different serogroups. Group B and C are the predominant ones seen in Ireland, accounting for approximately 60-65% and 30-35% of cases, respectively. However, the epidemiology of IMD is expected to change in Ireland over the coming years due to the introduction of the meningococcal group C conjugate (MCC) vaccine in October 2000. Everyone under the age of 23 years will be offered the vaccine, with the overall aim of eliminating group C disease from this age group, reducing it in older age groups and reducing the overall incidence of IMD in Ireland.

Methods

All cases of bacterial meningitis including IMD should be reported through the enhanced surveillance system in operation in Ireland. Through this system all suspected cases are notified by the Community Care Areas to the relevant Department of Public Health and NDSC. At NDSC data are inputted in an MS Access database. The NDSC database is reconciled monthly with the Meningococcal Reference Laboratory database and quarterly with the Departments of Public Health databases. Data analysis is performed using MS Access, MS Excel and Epi-Info. As the meningococcal season generally straddles the winter period in the northern hemisphere, July to June is now generally accepted as the epidemiological year for IMD. Data were therefore analysed according to epidemiological year July 2000 and June 2001 (2000/01) and compared with the same period the previous year (1999/00). Population data were taken from the 1996 census.
For surveillance purposes the diagnosis of IMD is classified as definite, presumed or possible as outlined in the Department of Health and Children's Working Group Report.[1]

Results

For the epidemiological year 2000/01, 405 cases of IMD were notified in Ireland. These notifications included four imported cases, three group B cases [1 each in the Eastern Regional Health Authority (ERHA), North-Western Health Board (NWHB) and Southern Health Board (SHB)] and one group C case (SHB). These four imported cases will be excluded from further analysis in this report, thereby leaving 401 cases for analysis. A case is classified as imported if the infection is known to have been acquired abroad or that the disease developed within two days of arrival in the country. Of the 401 cases notified, 288 of these were classified as definite, 40 as presumed and 73 as possible. The male: female ratio was 1.2:1.0.

There was a 28% decrease in IMD notifications in the 2000/01 period compared with the same period the previous year. The crude incidence rate dropped to 11.1 per 100,000 population from 15.3 per 100,000 population (554 cases in 1999/00, excluding 2 imported cases) (Figure 1). In 2000/01 the breakdown by serogroup was, 237 group B, (213 definite, 21 presumed, 3 possible), 66 group C, (63 definite, 3 possible), and the following definte cases, seven non-groupable (NG), four group W135 and three group Y.
Group B accounted for 75% of the serogrouped cases. The incidence of group B IMD dropped by 14.4% to 6.5 per 100,000 population in 2000/01 from 7.6 per 100,000 population in the 1999/00 period (Figure 1). The incidence of group C IMD dropped dramatically in the 2000/01 period, a 61% reduction being observed. The incidence of group C IMD decreased from 4.6 per 100,000 (167 cases, excluding 1 imported case) in 1999/00 to 1.8 per 100,000 population in 2000/01 (66 cases, excluding 1 imported case) (Figure 1).

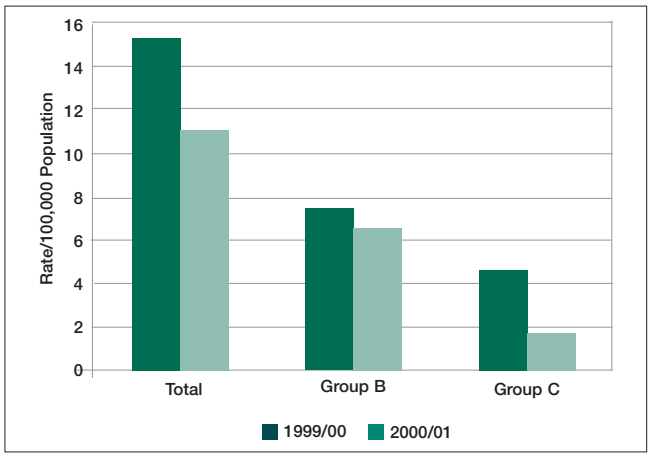

Figure 1: The incidence rates of total, group B, and group C IMD in Ireland for the epidemiological years 1999/00 and 2000/01.

The age standardised incidence rate (ASIR) for IMD varied from 7.6 per 100,000 population in the NWHB to 16.6 per 100,000 population in the SEHB. However, only the ASIR for the SEHB (16.6/100,000; 95% CI = 12.6-20.7) was regarded as significantly different from the national rate (11.1/100,000; 95% CI = 10.0-12.2), being significantly higher.

The ASIR for group B IMD ranged from 3.8 per 100,000 in the NWHB to 7.9 per 100,000 in the SEHB (Figure 2). There was no statistical difference between ASIR for group B IMD reported by each health board when compared with the national rate (6.5/100,000; 95% CI = 5.7-7.4). The ASIR for group C IMD was highest in the SHB (3.1/100,000; 95% CI = 1.65-4.65) and lowest in the WHB (0.3/100,000; 95% CI = 0.3-0.8) (Figure 2). The ASIR for group C IMD in the WHB was significantly lower than the national rate (1.8/100,000, 95% CI = 1.38-2.26), whereas the ASIR for the other health boards were not statistically different from the national rate.

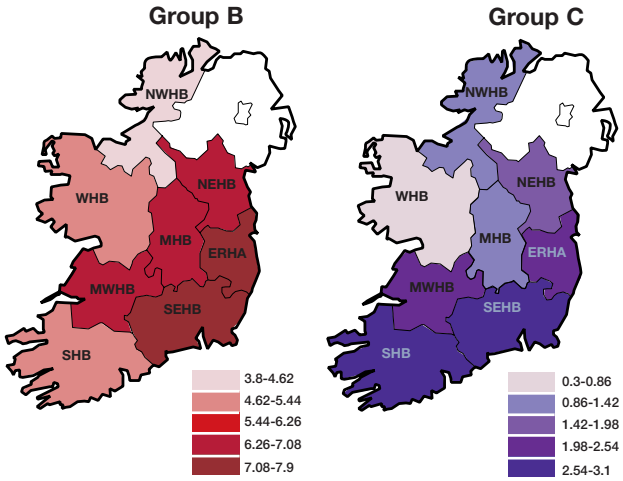

Figure 2: The age standardised incidence rates of group B and group C IMD by health board in 2000/01.

As seen in previous years the age specific incidence rates due to IMD were highest in the less than one year olds (184.2/100,000) and the 1-4 year olds (64.5/100,000). For group B IMD the age specific incidence rates were 112.6 and 43.2 per 100,000 population in these age groups, while for group C disease these rates were 24.6/100,000 and 9.4 per 100,00 population for these age groups (Table 1). The increase in incidence rate normally seen in the 15-19 years old age group for group C disease was not observed in the 2000/01 period. Apart from the over 24 years age group, the incidence of group C had declined in all the other age groups during this period.

Table 1: Number of cases, age-specific incidence rates, number of deaths and case fatality rates for group B and group C IMD between July and June 2000/01.

Age group	Group B				Group C			
	No. Cases	Rate*	No. Deaths	CFR**	No. Cases	Rate*	No. Deaths	CFR**
<1	55	112.6	5	9.1	12	24.6	0	0.0
1-4	87	43.2	1	1.1	19	9.4	0	0.0
5-9	27	9.5	0	0.0	5	1.8	0	0.0
10-14	17	5.2	1	5.9	9	2.8	2	22.2
15-19	29	8.5	1	3.4	12	3.5	2	16.7
20-24	12	4.1	1	8.3	1	0.3	0	0.0
25+	10	0.5	0	0.0	8	0.4	0	0.0
Total	**237**	**6.5**	**9**	**3.8**	**66**	**1.8**	**4**	**6.1**

* Rate = Age specific incidence rate per 100,000 population

** CFR = case fatality rate [(no. deaths/no. cases)*100] - %

There were 14 deaths due to IMD in the 2000/01 period, which was equivalent to a case fatality rate (CFR) of 3.5%. Nine of these deaths occurred in group B cases (CFR=3.8%), four in group C cases (CFR=6.1%) and one in a group Y case (CFR=33.3%). For group B IMD the CFR was highest in the less than one year olds at 9.1% (Table 1). Deaths due to group C occurred only in the 10-14 years (CFR=22.2%) and the 15-19 years age groups (CFR=16.7%) (Table 1).

Discussion

The introduction of the MCC vaccine appears to be having a very positive impact on the epidemiology of IMD in Ireland. The incidence of group C disease has been dramatically reduced from 4.6 per 100,000 population in 1999/00 to 1.8 per 100,000 in the 2000/01 period – a reduction of 61%. Prior to the introduction of the MCC vaccine, the epidemiology of group C disease had remained largely unchanged over the previous years, with an average of 134 cases being reported for each epidemiological year between 1997 and 2000. The reduction in the number of group C cases is even more impressive if the time period since the MCC was introduced is analysed. Between October 2000 and June 2001, 42 group C IMD cases were notified compared to 142 cases in the same period the previous year - indicating a reduction of 70.4%. Forty of the 42 group C cases occurred in unvaccinated individuals, while two cases had been vaccinated. One case, a 12-year old female had received the vaccine just one day prior to the onset of symptoms and therefore would not have been protected. The other case, an 18-year old male had been vaccinated 23 days prior to becoming ill, but since the patient's serum bactericidal antibody level was quite elevated within a few days of acquiring the infection, it is felt that the vaccine greatly assisted in the patient's speedy and complete recovery.

The overall incidence of IMD has also been reduced in Ireland in 2000/01 period when compared with previous years. There are no indications to date that the incidence of IMD due to non-B, non-C serogroups is increasing in Ireland. In the 2000/01 period four group W135 and three group Y cases were reported compared to three group W135 and three group Y cases in the same period the previous year. In 2000 and 2001 an outbreak of a specific serotype of group W135 (2a:P1.2, 5) occurred in some European countries. This was associated with pilgrims returning from The Hajj in Saudi Arabia. No Hajj related strains were reported in Ireland.

The number of deaths due to IMD dropped from 26 in 1999/00 to 14 in 2000/01, thereby reducing the CFR from 4.7% to 3.5%. There were 11 deaths due to group C IMD in 1999/01 compared to four in 2000/01, further highlighting the positive impact the MCC vaccine is having on group C IMD in Ireland. However, for the MCC vaccine to continue having a positive impact in reducing/eliminating morbidity and mortality due to group C IMD, it is vital that high uptake rates for the vaccine are achieved and maintained. The uptake rates should be monitored on an ongoing basis, so that problem areas or age groups can be identified and the necessary steps taken to encourage uptake in these groups.

Dr Margaret Fitzgerald & Dr Darina O'Flanagan, NDSC.
Dr Mary Cafferkey and Ms Karen Murphy, MRL.

Acknowledgements

The authors wish to thank all those involved in the surveillance of meningococcal disease in Ireland – Community Care Areas, Departments of Public Health and Microbiology Laboratories.

References

1. The Department of Health and Children. Working Group Report on Bacterial Meningitis and Related Conditions, July 1999. Available at http://www.doh.ie/publications/bm99.html

HEAD LICE 'PEDICULUS HUMANUS CAPITIS'

Each school year, infestations by head lice cause parents, carers and teachers to seek information and solutions to this burdensome common problem.

Characteristics

Head lice live on the scalp and neck hairs. They are small ectoparasites with six legs (for grasping hair shaft) and are 2mm long. The female louse has a 30-day life span, laying up to 10 eggs per day, which attach firmly approximately 1mm from the scalp (where the temperature is optimal for incubation). Larvae emerge 8 to 10 days later. Generally, infected people have less than 12 active lice on the scalp at any one time. The hatched eggs start to feed and grow by deriving nutrients by blood feeding at least once a day. Lice will perish when separated from the human host for more than 24 hours. Eggs will lose viability within one week.

Transmission

Lice do not fly or jump but are acquired by direct head to head contact. Infrequently, they can be transferred with shared combs, hats and hair accessories or may remain on bedding/furniture for a brief period. They are not transmitted from household pets/animals. Children are prone to infestation, as they have close contact with each other at school or when playing.

Clinical Features

Head lice are not known to transmit infectious agents from person to person. Initial symptoms include itching particularly behind the ear and the back of the neck with potential loss of sleep. Lice saliva and faeces may sensitise people to their bites, exacerbating the irritation and increasing the chance of secondary infection from excessive scratching. The eyelashes may be involved.

Chemical Treatment

There are two main groups of chemicals used to treat head lice:

1. Pyrethroids

Permethrin – Lyclear cream rinse 1%
Phenothrin – Headmaster lotion 0.2%

2. Non Pyrethroids

Organo Phosphates (Malathion)
Liquid 0.5% (in an aqueous basis) – 'Derbac M', 'Quellada M'
Lotion 0.5%(in an alcoholic basis) – 'Prioderm'
(Quellada M, Prioderm are also available as a shampoo).

Carbamates (Carbaryl)
'Carylderm', 'Derbac C' , 'Suleo-C'
(removed from market here)

Points to consider when choosing treatments

- Lotion, liquid or cream rinse formulation should be used in preference to shampoo (too dilute).
- Alcohol based lotions may aggravate asthma and eczema.
- Permethrin should be avoided in pregnancy and during lactation.
- Malathion and Carbaryl are not excreted in breast milk.
- Carbaryl is available here on a named patient basis only.
- Only Malathion is available on the medical card.
- "Full Marks" (phenothrin) is not licenced in Ireland.
- Persistent use of one preparation encourages the emergence of resistant strains especially if the treatment is inadequate. If one insecticide fails or re-infection occurs, a different preparation should be used. When choosing a preparation, local resistance patterns should be considered.

Treatment failure

Failures of treatment are usually due to misdiagnosis, non-compliance, resistance by lice to insecticides, or new infestation. The British National Formulary recommends that a course of treatment for head lice should be two applications of the product, seven days apart to prevent lice emerging from any eggs that survive the first application.[1] All members of an infected person's household should be checked. Only those who have living moving lice should be treated.

Mechanical Methods

'Bug busting' involves wet combing with a 'fine toothed' or 'nit comb' and conditioner (some suggest olive oil or grape seed oil as a preferred lubricant). The method requires meticulous combing from the root upwards over the whole scalp, checking the comb for lice and clearing away after each sweep. It should be done at 3 to 5 day intervals for a minimal of two weeks, for at least 30 minutes each time. Electronic combs are also available at a cost, but offer little advantage.

A study comparing malathion with wet combing found malathion twice as effective. Mechanical methods should not be recommended as first-line treatment, but remain reasonable approaches when insecticides continue to fail or when families refuse insecticide treatment.

Repellents

Repellents such as Rappell (piperonal 2%) may protect individuals from becoming infested but do not treat existing infestations.

Alternative "Cures"

Many claims have been made about the effectiveness of various "cures" such as herbal extracts, suffocation agents and essential oils, however there is no published evidence of their efficacy. Some essential oils can be toxic especially as concentrates.

Key Points

- Head lice are a common problem and can be a nuisance.
- Particular risk groups are pre-school and primary school children.
- No link exists between head lice and lack of hygiene.
- Of all treatments available, Permethrin stands up best to scientific scrutiny.
- The evidence for use of the 'Bug Busting' method is mainly anecdotal.
- The misguided use of caustic or toxic substances to eliminate the lice can be harmful.
- Head lice should not cause a child to be isolated or sent home from school.

Dr Louise Kyne, RCPI (Paeds)

Reference
1. British National Formulary (No. 41), March 2001. Available at http://bnf.vhn.net/home/

Salmonella Monthly Report (September 2001):

Strains are allocated to months based on the date of receipt of the isolate from the referring laboratory. These figures are provisional as work may not be finished on particular strains at the time of publication. Data are provided courtesy of Prof Martin Cormican and Dr Geraldine Corbett-Feeney, INSRL.

Health Board	E	M	MW	NE	NW	SE	S	W	Total
S. Typhimurium	6	0	2	0	3	2	1	0	14
S. Enteritidis	18	3	4	3	3	1	11	4	47
S. Agona	0	0	0	0	0	0	1	0	1
S. Anatum	1	0	0	0	0	0	0	0	1
S. Kentucky	0	0	0	0	0	0	0	1	1
S. Stanley	0	0	0	0	0	0	0	1	1
S. Uganda	0	0	0	0	0	0	0	1	1
S. Virchow	0	2	0	0	0	1	0	0	3
Total	25	5	6	3	6	4	13	7	69