Invasive meningococcal disease - focus on Meningococcal B - epidemiology, international and Ireland

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Scope presentation

• Meningococcal disease epidemiology-general
• Meningococcal B disease epidemiology-Ireland
• Rationale for introduction of MenB vaccine
Worldwide distribution of major meningococcal serogroups

L.Harrison. The Epidemiology of Meningococcal Disease in the United States
IMD in Europe*

- IMD is rare in Europe:
  - 0.68 cases per 100 000 population in 2012
  - country-specific rates confirmed IMD: 0.11 to 1.77 cases per 100 000 population
- Infants < 1 year of age highest risk of infection
  - followed by 15–24 year old age group.
- Serogroup B and C dominant
  - Serogroup Y has been increasing, but less frequent than B and C.
- Overall case fatality ~10%,
  - with many survivors suffering serious long-term sequelae.
- Overall decreasing trend in last 10 years;
  - serogroup C conjugate vaccine introduced to national immunisation schedules in some countries.

*ECDC Annual epidemiological report 2014
Annual Epidemiological Report - vaccine-preventable diseases - invasive bacterial diseases. Date publication 11/2/2015
Source: Country reports from Austria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom.
Rates of confirmed IM, by serogroup, EU/EEA, 2008-2012 (n=20,161)

Source: Country reports; NGA: non-groupable; Unk: unknown. The specific codes are kept for the most common serogroups. Others are the remaining/other groupable serogroups that should be reported. Apart from serogroups reported as ‘other’ (n=42), it includes cases of serogroups 29E (13), X (n=13) and Z (n=5) reported during the period 2008-2012.

Annual Epidemiological Report - vaccine-preventable diseases - invasive bacterial diseases. Date publication 11/2/2015
Rates of confirmed IMD, by age and serogroup, EU/EEA, 2012 (n=3 233)

Source: Country reports; NGA: non-groupable; 'Other' includes confirmed cases reported as serogroup 'other' (n=15), as serogroup A (n=12), serogroup 29E (n=3) and serogroup Z (n=1). The specific codes are kept for the most common serogroups. Others are the remaining/other groupable serogroups that should be reported.

Annual Epidemiological Report - vaccine-preventable diseases - invasive bacterial diseases. Date publication 11/2/2015
Selected Rates of confirmed invasive meningococcal disease reported cases, EU/EEA, 2008, 2012

IMD by Serogroup in Ireland, 1999 - 2015* (Rate per 100,000)

*2015 data provisional
Proportion of IMD by serogroup, ROI 1999-2015*

% all notifications

Year


No org detected
Non-groupable
Y
W135
C
B
### IMD in Ireland, 1999 - 2015*

#### Annual Number of Cases by Serogroup

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<th>B</th>
<th>C</th>
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<th>Y</th>
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*2015 data provisional
Incidence rates /100,000 IMD in Ireland by Serogroup, 1999 - 2015*

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<th>Total</th>
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*2015 data provisional
IMD Deaths Ireland, total and serogroup B, 1999-2015

- Total IMD deaths
- Serogroup B deaths
- % total that were B
ASIR* MenB disease 2011-2015

*2011 census data
Recent epidemiology of IMD / relevance to new vaccines

• In recent years > 80% of IMD cases due to serogroup B infection

• Majority of IMD deaths are caused by MenB disease
  – Between 1999- 2015 : 76% of all IMD deaths
  – Between 2004-2015 : 82% of all IMD deaths
Novartis ‘Bexsero’ (4CMenB) Meningitis B Vaccine

Re-evaluating cost effectiveness of universal meningitis vaccination (Bexsero) in England: modelling study

- Case reduction greatest with routine infant immunisation (26.3% of cases averted in first five years).
- Strategy could be cost effective at £3 (€3.8, $4.9) a vaccine dose
- If vaccine can disrupt meningococcal transmission more cases are prevented in long term with infant and adolescent combined programme (51.8% after 30 years), could be cost effective at £4/vaccine dose.
- Assuming vaccine reduces acquisition by 30%, adolescent vaccination alone is most favourable strategy economically, but takes more than 20 years to substantially reduce the number of cases.

- Conclusions: Routine infant vaccination most effective short term strategy and could be cost effective with a low vaccine price. Critically, if the vaccine reduces carriage acquisition in teenagers, the combination of infant and adolescent vaccination could result in substantial long term reductions in cases and be cost effective with competitive vaccine pricing.

Countries that have introduced MenB vaccine into national programme

• New Zealand – Specific vaccine
• Brazil/Cuba
• UK - 2015
• Czech Republic
• Ireland
Conclusion

• Despite decrease in IMD in recent years, Ireland continues to have high incidence of IMD caused by serogroup B
• Introduction of MenB vaccine expected to further decrease serogroup B incidence
• Need to monitor
  – impact on IMD in Ireland
  – molecular characteristics of strains in circulation
  – Vaccine safety (Health Products Regulatory Authority)
Acknowledgements

- Dr Piaras O’Lorcan (Phd) HPSC
- Departments of Public Health
- Microbiology Laboratories
- Irish Meningococcal and Meningitis Reference Laboratory (IMMRL) in the CUH, Temple Street
- National Pneumococcal Typing Project (RCSI/Beaumont)
- Department of Health and Children