Invasive Pneumococcal Disease (IPD) in Ireland, 2004

Key Points

- ***Streptococcus pneumoniae* is commonly associated with pneumonia, meningitis, bacteraemia, sinusitis or otitis media**
- **400 cases of invasive pneumococcal disease (IPD) were reported in Ireland through EARSS during 2004**
- **Highest incidence rates of IPD were found among the elderly and the very young**
- **Pneumococcal vaccine is recommended for individuals at increased risk of infection, including all individuals 64 years of age or older**

Introduction

Invasive pneumococcal disease (IPD) is caused by the organism *Streptococcus pneumoniae*. *S. Pneumoniae* is one of the most common bacterial causes of acute otitis media and invasive bacterial infections in children. It is commonly associated with sinusitis, community acquired pneumonia and conjunctivitis. It is also the second most common organism (after *N. Meningitidis*) causing bacterial meningitis in Ireland (accounting for 8% of all bacterial meningitis cases in 2004). Those most at risk of meningitis are young children and older age groups.

More than 90 serotypes of *S. pneumoniae* have been described since the organism was first identified by Pasteur in 1881. Although most serotypes have been shown to cause serious disease, only a few serotypes produce the majority of pneumococcal infections. The 10 most common serotypes are estimated to account for over 60% of invasive disease worldwide.

The true burden of disease associated with IPD in Ireland is evident with the information available from European Antimicrobial Resistance Surveillance System (EARSS). EARSS started in Ireland in 1999 and provides information on the number of isolates of *S. pneumoniae* from participating laboratories (see chapter on EARSS for additional information). EARSS participating laboratories are now estimated to cover approximately 98% of the Irish population. Additionally, since January 1st 2004 all invasive *S. pneumoniae* infections or laboratory confirmed diagnoses (isolation of *S. pneumoniae* or detection of *S. pneumoniae* nucleic acid from

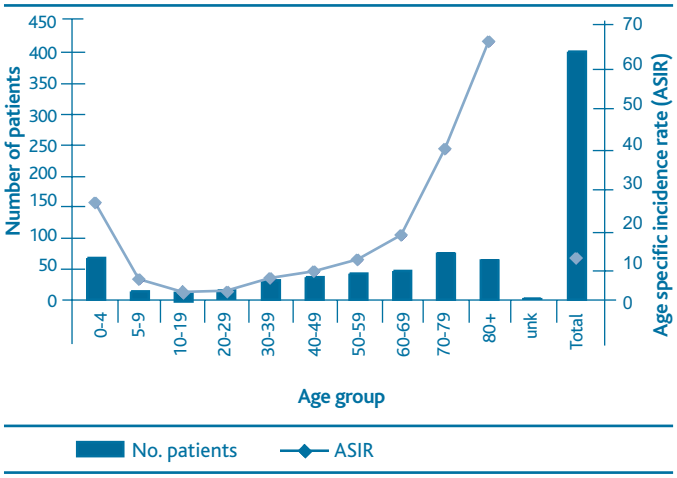

Figure 1. Invasive Streptococcus pneumoniae cases and age specific incidence rates (ASIR), by age group, notified in 2004

a normally sterile site) should be notified to the medical officer of health. A detailed description of the case definition is provided in the HPSC Case Definitions booklet.[1]

Information on the number of isolates of invasive *S. pneumoniae* during 2004 is more accurately reported through EARSS, therefore, the EARSS data is used in the following discussion of the epidemiology of IPD in Ireland during 2004. Reference is made to IPD notifications reported through the weekly notification system. Incidence rates are calculated using population data taken from the 2002 census.

Results

In 2004, four hundred cases of IPD were reported through EARSS. In contrast, 159 cases were reported through the weekly notification system. EARSS data clearly provides a more accurate reflection of disease incidence in the country than weekly IPD notifications made to the medical officer of health.

The 400 IPD cases reported through EARSS during 2004 represents an estimated crude incidence rate of 10.4 cases per 100,000 population (extrapolated from EARSS laboratories covering 98% of the population).

Males and females were similarly affected (ratio 1.06:1). The highest age specific incidence rates (ASIR) were reported among those greater than 64 years of age (37.6 per 1000,000; 164 cases) and among children in the 0-4 year age (24.1 per 100,000 population; 67 cases). Incidence rates are highest in the oldest age groups (≥ 85 years of age, ASIR of 64.6 per 100,000). The number of cases of IPD and the ASIRs are presented in Figure 1.

No serotype data was provided on any of the *S. pneumoniae* isolates in 2004.

Discussion

During 2004, IPD caused substantial morbidity, with 400 IPD cases reported through EARSS. The weekly notification system only identified 159 IPD cases, demonstrating substantial under-reporting to Medical Officers of Health (MoH). The reason for this under-reporting to the MoH is unclear. It may reflect either 1) lack of awareness among clinicians that all IPD cases should be reported or 2) inaccurate belief amongst clinical directors of laboratories that by reporting IPD isolates to EARSS that they are fulfilling their statutory obligation. It is most likely that under-reporting is related to a combination of these two factors.

IPD rates reported in Ireland in 2004, although less than those reported in the United States prior to introduction of a 7-valent pneumococcal conjugate vaccine for children (average 24.3/100,000 for 1998 and 1999)[2], are similar to those reported from the UK (9.9/100,000) in 2003/04.[3]

Two age groups are found to have the highest incidence of IPD, the 0-4 year age group and the over 64 year age group, a finding reported in other countries.[2,3] In recognition of the increased risk of infection among the elderly population, all individuals 65 years of age or older in Ireland are recommended pneumococcal vaccine to protect against IPD and its complications.

Other groups are also recognised at being at increased risk of infection or its complications and are recommended pneumococccal vaccination.[4] Those considered to be most at risk are those with the following conditions: no spleens or splenic dysfunction; chronic renal disease or nephrotic syndrome; chronic heart, lung or liver disease; diabetes mellitus; sickle disease; CSF leaks; cochlear implants; as well as the elderly (65 years of age or older). Two types of pneumococcal vaccine are available, 23-valent polysaccharide pneumococccal, recommended for those 24 months and older, and a 7-valent conjugate vaccine, recommended for infants and children at risk.

Currently in Ireland there are no national data available on vaccination uptake rates amongst these risk groups. Nor do current surveillance systems in place routinely identify whether or not an IPD case belongs to a risk group, or whether they were vaccinated. As information on serotypes was not available for any of the IPD isolates in 2004 it is difficult to estimate the potential vaccine efficacy in the Irish population even if vaccine uptake data were available.

IPD is a potentially vaccine preventable disease. Therefore, understanding the distribution of the disease, the risk factors for infection, vaccination uptake and the *S. pneumoniae* serotypes in circulation in Ireland is fundamental to improving control and preventing infection among those most at risk.

Recommendations

Improving information on IPD epidemiology will more accurately quantify the burden of disease, risk factors for infection and missed opportunities for immunisation.

All clinicians and laboratory directors should report IPD cases to the MoH. Additionally, laboratories should also report *S. pneumoniae* isolates to EARSS according to agreed protocols.

Developing laboratory capacity so that *S. pneumoniae* isolates can be serotyped is integral to any future surveillance programme.

References

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