

P0188

Paper Poster Session I

Focus: Pneumococcus

Surveillance of invasive pneumococcal disease and antimicrobial resistance in the adult population in Ireland from 2007 - 2014

I. Vickers¹, M. Corcoran¹, M. McElligott¹, J. Mereckiene¹, M. Fitzgerald¹, S. Murchan¹, S. Cotter¹, M. Cafferkey^{1,3,4}, D. O'Flanagan¹, C. Robert^{1,2,3}, H. Humphreys^{1,4,5}

¹*Pneumococcal Reference Laboratory- Epidemiology and Molecular Biology Unit EMBU Laboratory, Temple Street Childrens University Hospital, Dublin, Ireland*

²*Department of Microbiology- Beaumont Hospital, Dublin, Ireland*

Objectives: The majority of invasive pneumococcal disease (IPD) infections are caused by a subset of predominant *Streptococcus pneumoniae* serotypes, which are included in pneumococcal conjugate vaccines (PCV's) and pneumococcal polysaccharide vaccines (PPV). PPV vaccination is recommended for all adults over 65 years old and those who may have an increased risk of contracting IPD. PCV vaccines are part of the childhood immunisation programme and may reduce the overall burden of IPD through a herd-effect. The objective of this study was to assess the serotype distribution and antimicrobial resistance associated with IPD in adults, i.e. those ≥ 18 years of age.

Methods: *S. pneumoniae* isolates from sterile-sites were submitted for serotyping using multiplex-PCR and serological co-agglutination. Susceptibilities to penicillin, cefotaxime and erythromycin were determined using the E-test method and interpreted according to CLSI guidelines. Reduced susceptibility to penicillin was reported if the minimum inhibitory concentration (MIC) was ≥ 0.12 mg/L and cefotaxime or erythromycin if the MIC's were ≥ 0.5 mg/L.

Results: There was a total of 1852 IPD isolates from adults between July 2007 and June 2014, i.e. seven epidemiological years, with a range of 230-298 isolates typed annually. There was an increase in the number of non-PPV vaccine associated serotypes, which increased by almost 50% from $n=43$ in 2007-08 to $n=85$ in 2013-2014 ($p < 0.001$). There was a 26% decline in the number of PPV vaccine associated serotypes from $n=234$ to $n=173$ over the same period. PCV7 associated serotypes fell by 83% over the same period ($p < 0.001$), while the additional PCV13 associated serotypes (PCV13-7) increased marginally. There were 229 IPD isolates from adults aged between 18-39 years old, 586 in adults 40-64 years, 399 in adults 65-74 years old, 412 in adults aged 75-84 years and 226 in adults ≥ 85 years old. The proportion of IPD isolates covered by PCV7, PCV13 and PPV were 27%, 31% and 76% respectively. The five predominant serotypes which accounted for 38% of all IPD isolates were 7F, 19A, 22F, 14 and 8, all of which are included in the PPV vaccine. Serotypes 7F and 19A are also in PCV13 while serotype 14 is included in PCV7, PCV13 and PPV. Penicillin non-susceptible pneumococci (PNSP) increased gradually with age: 11% in patients 18-39 years old to 29% in patients ≥ 85 years old ($p < 0.001$). Reduced susceptibility to cefotaxime and erythromycin was 13% and 6%, respectively for all adults.

Conclusion: The results demonstrate that PCV7, PCV13 and PPV have a potential coverage 27%, 31% and 76%, respectively for adult IPD infections. Also, increased antimicrobial resistance is associated with the elderly population, which is of concern.