Pneumococcal infections in neonatal period

EV1007

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Introduction

Streptococcus pneumoniae **remains the major cause of severe invasive infections especially among the very young and the elderly world-wide, including mostly bacteremic pneumonia, sepsis and meningitis. In the neonatal period, pneumococcal infections are infrequent but generally related with high mortality and may have an early or late onset.**

The objective of the study was to characterise isolates of *S.pneumoniae* responsible for invasive infections in neonates in Poland, where mass vaccination against pneumococci has not been implemented.

Material and methods

Pneumococcal database of the National Reference Centre for Bacterial Meningitis (NRCBM) in Warsaw was screened for laboratory-confirmed neonatal invasive infections. Isolates were identified based on typical morphology, Gram stain, susceptibility to optochin and bile solubility. Serotypes were determined by the Pneumotest-Latex kit, a PCR or the Quellung reaction. MICs were determined by the Etest or M.I.C.Evaluator methods and interpreted according to the EUCAST criteria. Selected isolates were characterised by multilocus sequence typing.

Table 1. Characteristics of neonatal cases

No	Year	Age in days	Sex	Material	Region	Diagnosis	Serotype	ST
1	2004	25	m	CSF	mazowieckie	meningitis	3	180
2	2006	1	m	blood	wielkopolskie	sepsis	19F	66
3	2007	1	m	blood	wielkopolskie	septic pneumonia	3	505
4	2008	2	f	blood	mazowieckie	IPD	8	1480
5	2009	1	m	blood	mazowieckie	pneumonia	1	306
6	2009	1	f	blood	śląskie	sepsis	12F	218
7	2009	1	m	blood	opolskie	pneumonia	3	4735
8	2010	28	m	pleural fluid	mazowieckie	pneumonia	3	505
9	2011	2	m	blood	śląskie	bacteremia	31	nd
10	2011	1	m	blood	opolskie	sepsis	3	nd
11	2011	1	f	blood	opolskie	sepsis	3	nd
12	2011	2	m	blood	podkarpackie	bacteremia	11A	nd
13	2012	1	f	blood	dolnośląskie	bacteremia	11A	nd
14	2012	1	f	blood	śląskie	sepsis	9V	nd
15	2014	27	f	blood	mazowieckie	pneumonia	3	nd

nd – not done

Results

Between 2004 and 2014 among 2349 confirmed invasive cases 15 (0.64%) were diagnosed in neonates, including 9 boys. Of these, 12 had early-onset; including 9 and 3 newborns with symptoms in first and second day of life, respectively. The remaining 3 newborns developed symptoms in 24th, 27th and 28th day of life. Five newborns were diagnosed as having bacteremic/septic pneumonia, 5 sepsis, 4 bacteraemia and 1 meningitis. Late-onset infections contained 2 pneumonia cases and 1 meningitis. Outcome of infections was known for 9 patients; all of them recovered. Among 15 pneumococcal isolates seven belonged to serotype 3 (46.7%) and two to 11A (13.3%). Serotypes 1, 8, 9V, 12F, 19F and 31 were represented by single isolates. All late-onset infections were caused by isolates of serotype 3. PCV10, and PCV13 covered theoretically 20%, and 67% of cases, respectively. All isolates were susceptible to penicillin, cefotaxime, vancomycin, meropenem, chloramphenicol and rifampicin. The isolates of serotype 3 represented different sequence types (180, 505, 4735) of the same clonal complex, CC180 (PMEN global clone Netherlands 3-31).

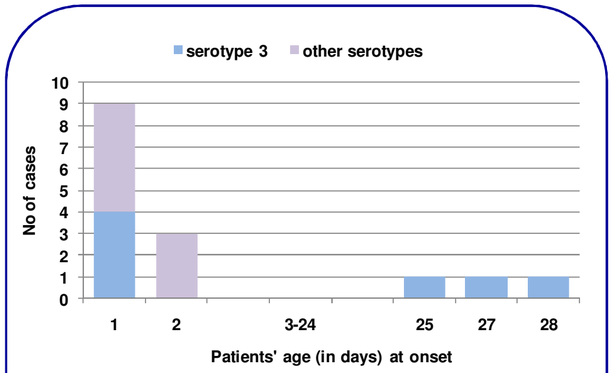

Fig. 1. Patients' age at pneumococcal infection onset

Conclusions

Streptococcus pneumoniae **should be considered as a possible cause of invasive infection in neonates. Surprisingly, almost half of invasive cases among Polish newborns were caused by isolates of serotype 3, which is generally rare cause of disease in children.**

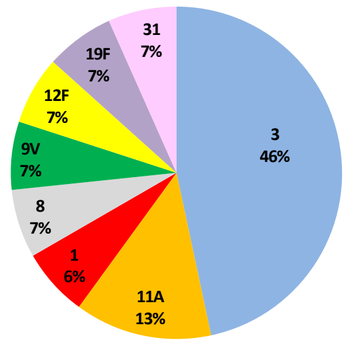

Fig. 2. Serotypes distribution among *S.pneumoniae* responsible for neonatal cases

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