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Group B streptococcal neonatal infections in Iceland : 1979 – 2014

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Background: Group B Streptococcus (GBS) is a leading cause of neonatal invasive infections in developed countries. The aim of this study was to determine the serotype distribution, molecular characteristics and antimicrobial resistance of invasive GBS isolates recovered from neonates in Iceland in the years 1979 to 2014.

Material/methods: A total of 95 isolates were available. Serotyping was performed by latex agglutination. Multilocus sequence typing (MLST) was performed by PCR and isolates were assigned to clonal complexes (CC) according to their sequence types (ST). PCR was used to determine the presence of surface protein encoding genes bca, eps, alp2, alp3, alp4 and rib and of pilus islands PI-1, PI-2a and PI-2b. Susceptibility to penicillin, erythromycin, clindamycin, streptomycin and tetracycline was tested by disc diffusion and macrolide and tetracycline resistance genes were detected by PCR.

Results: A total of 115 invasive neonatal infections where found over the study period, 64 from early-onset disease (EOD) and 51 from late-onset disease (LOD), for an average incidence of 0.7/1000 live births (0.4 and 0.3/1000 live births in EOD and LOD, respectively). The isolates grouped into 7 CCs with 22 STs. Serotypes III and Ia were the most frequent in the population, together accounting for over 70% of the isolates. While in EOD serotype III was evenly distributed between CC17 and CC19 (42% and 58%, respectively), in LOD CC17 was much more frequent than CC19 (78% and 22%, respectively), reflecting an overrepresentation of CC17 in LOD cases (P=0.03). Almost 30% of serotype Ia isolates were part of the ST7/bca clone which is often associated with disease in fish, and all carried the PI-1+P1-2b combination, usually found in isolates of serotype III/CC17. Throughout the study period both serotypes III and Ia increased but the changes were not statistically supported. In contrast, the decrease in serotype Ib was significant (P=0.01) All isolates were susceptible to penicillin and only one was resistant to streptomycin. Erythromycin and clindamycin resistance rates were 7%, with most isolates displaying the $cMLS_B$ phenotype. Tetracycline resistance was 85%, mostly associated with the tetM gene.

Conclusions: Serotype distribution, antimicrobial susceptibility, and sequence type characterization in invasive neonates infections in Iceland is similar to what has been described elsewhere. The most common ST types and serotypes, ST17/III, ST19/III and ST23/Ia are responsible for about 70% of all infections.