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Bloodstream infections: epidemiology and management

Changing serotypes of *Streptococcus agalactiae* causing invasive infections in adults in Portugal (2009-2014)

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Background: In the past decades Lancefield group B streptococci (GBS) has been increasingly associated with invasive disease in adults. We have characterized n=397 GBS isolates recovered from invasive infections in adults in Portugal. Our aim was to document the prevalence of serotypes and antimicrobial resistance patterns and to compare them with our previous study (2001-2008).

Material/methods: The number of infections reported per year was compared to the adult population in Portugal in the study period. All GBS isolates were serotyped by agglutination with specific sera (Ia, Ib, II-IX). Susceptibility to penicillin, erythromycin and clindamycin was tested by disk diffusion according to the CLSI guidelines. Presence of macrolide resistance conferring genes was determined by PCR.

Results: The number of hospitals in our surveillance network was stable but the number of GBS infections increased throughout the study period (P=0.014). Serotype Ia was the most frequent in our collection (34.3%), similarly to what we found in our previous study (2001-2008) (Figure). Serotypes III and V also did not show significant changes between the two studies. However, the relative frequency of two other serotypes changed between the two periods (Figure). Serotype Ib was now the second most prevalent, showing a significant increase from 8.9% in 2001-2008 to 21.9% in 2009-2014 (P<0.001). In contrast, serotype II decreased in frequency in the population (P=0.03). We have also identified a small fraction of isolates presenting serotype IX (1.3%), which may have been missed and considered non-typeable in the previous study since specific sera for this serotype was not used.

All isolates were susceptible to penicillin. Overall macrolide resistance was 34%, substantially higher than that found in the previous study (13%). Macrolide resistance increased throughout this study period and was statistically associated with serotype Ib (n=74/87, P<0.001). This is in contrast to 2001-2008 when macrolide resistance was overrepresented in serotype V. Among the n=134 resistant isolates, n=108 (81%) presented the cMLS_B phenotype, in most cases (n=103) associated with the *erm(B)* gene, 23 the iMLS_B phenotype and 3 the M phenotype. The *erm(TR)* and *mef(E)* genes, and gene combinations were also found.

Conclusions: The characterization of GBS isolates recovered from invasive infections among adults in Portugal (2009-2014) revealed that some serotypes remained stable over a significant time-span, such as Ia, III and V. On the other hand, serotype Ib increased considerably in recent years and is now the second most frequent serotype causing invasive disease in adults. Furthermore, the high proportion of macrolide resistance found in these isolates, in spite of a decreasing trend in macrolide consumption in Portugal since 2009; raise the possibility of ongoing selection and expansion of a specific virulent GBS genotype that is also macrolide resistant.

