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Macrolide and lincosamide resistance amongst Group B Streptococci – a growing concern?

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Group B Streptococcus (GBS) is the leading cause of invasive neonatal disease worldwide, with fatality rates of up to 10%. It colonizes the genitourinary tract of approximately 30% of pregnant women and in recent years it has become a growing concern amongst non-pregnant adults. Penicillin remains the first line of treatment for GBS infections, however there have been reports of reduced sensitivity in some countries. Clindamycin and erythromycin are used in cases of beta-lactam allergy, with rates of resistance to these antibiotics continuing to rise. This study aimed to investigate the incidence of antimicrobial resistance in a clinical population of GBS isolates (n=235). Antimicrobial susceptibility testing was performed according to EUCAST guidelines and the underlying mechanism of resistance was determined, both phenotypically and genotypically. Isolates were further characterized based on their serotype using molecular methods and the prevalence of the hyper-virulent ST-17 clone was investigated. Resistance to erythromycin and clindamycin was observed in 21.3% and 20.4% of the total population respectively. The c-MLSB phenotype was the most common, detected in 62% of isolates, followed by i-MLSB (20%) and M (18%) phenotypes. The rare L phenotype was also confirmed in the clinical population. *ErmB* was the predominant genetic determinant, identified in 84% of isolates. Both *mef*A/E and *erm*TR were each present in 18% of the isolates. Molecular serotyping analysis revealed capsular types Ia, III and II were the most common serotypes (28.1%, 24.7% and 14% respectively). Evidence of capsular switching was observed in one GBS isolate, which has implications for vaccines that target the capsular polysaccharide. This work highlights emerging trends in antimicrobial resistance amongst the Irish GBS population and emphasizes the need for continued monitoring of antibiotic resistance and serotype distribution in the population.

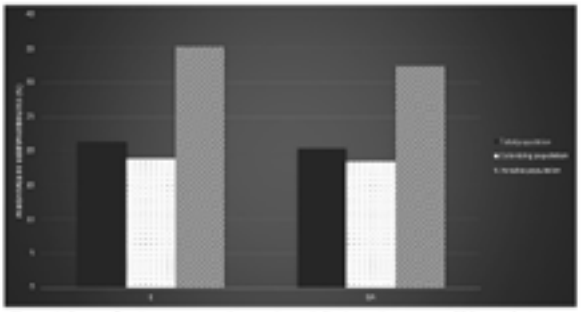

Figure 1: Rates of resistance to erythromycin and clindamycin amongst GBS populations.
E, erythromycin; CA, clindamycin.
Total no. of isolates, n=235; E-resistance, 21.3%; DA-resistance, 20.4%. Colonizing isolates, n=201; E-resistance, 18.9%; DA-resistance, 18.4%. Invasive isolates, n=34; E-resistance, 35.3%; DA-resistance, 32.4%.

Biography

Katherine Hayes is a Postgraduate student in the Biological Sciences at the Department of Cork Institute of Technology. Upon completion of her undergraduate degree in Biomedical Science, she was awarded a RÍSAM Scholarship by CIT. With interests in clinical microbiology and molecular biology, she is undertaking research on Group B Streptococci with a project entitled "Group B Streptococci - molecular epidemiology, pathogenic profiling and control strategies" under the joint supervision of Dr. Lesley Cotter and Dr. Fiona O' Halloran.

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