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SURVEILLANCE OF ANTIMICROBIAL RESISTANCE IN *STREPTOCOCCUS AGALACTIAE* ISOLATED FROM PATIENTS IN BELGIUM (1989-1991 vs.1996-1999)

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ABSTRACT

Background: *Streptococcus agalactiae* is the major cause of early onset infectious disease (EOD) in neonates, but it is also responsible for severe infections among adults. Associated with high mortality and morbidity, empiric therapy can start before availability of susceptibility results and most of EOD can be prevented through intrapartum chemoprophylaxis.

Methods: Activity of 11 antibiotics was studied against 393 strains referred to the Belgian GBS reference laboratory. Their susceptibilities were determined by the agar dilution method according to NCCLS guidelines. Between 1989 – 1991, 158 strains (S1) were collected: 56 were recovered from infected adults and 102 from colonization. And between 1996 – 1999, 235 strains (S2) were collected: 67 were recovered from severe infections in neonates, 80 from invasive infections in adults and 88 from colonization.

Results: All strains were fully susceptible to the tested β -lactam antibiotics (penicillin, ampicillin and ceftriaxone) with MICs \leq 0.0625 mg/L. With 100 % of susceptibility, a MIC₉₀ \leq 0.25 mg/L was found for vancomycin; ciprofloxacin and rifampin showed MIC₉₀ \leq 0.5 mg/L and \leq 0.125 mg/L respectively. For erythromycin (E), R/intermediate rates detected were 3,2/1.9% and 6,8/2.1% for S1 and S2 isolates. For clindamycin, R rates were 1.9% and 3% respectively for S1 and S2. Tetracyclines remain active against 17.1% of S1 isolates and 17.9% of S2. No high level of -gentamicin or -amikacin resistance was observed: gentamicin MIC₉₀ was 8 mg/L for S1 and S2 and for amikacin MIC₉₀ was 8 mg/L for S1 and 16 mg/L for S2 isolates.

Conclusions: 1) Susceptibility patterns remained relatively constant between the S1 and S2 isolates. Any significant difference was observed but just a trend of increasing R to E. 2) β -lactams have maintained a high level of activity. 3) Ongoing surveillance for R and mechanisms of R to erythromycin – clindamycin is imperative.

MATERIAL & METHODS

Bacterial strains

Clinical isolates

A total of 393 isolates collected through the whole country during two periods, 1989-1991 and 1996-1999, and referred to the Belgian GBS reference laboratory were tested in this study. The isolates were maintained at -70°C.

Strains isolated from	1989-1991	1996-1999	Total
EOD and LOD in neonates	-	67	67
Invasive infections in adults	56	80	136
Colonization	102	88	190
TOTAL	158	235	393

Q.C. Strains

Streptococcus pneumoniae ATCC® 49619
Enterococcus faecalis ATCC® 29212
Staphylococcus aureus ATCC® 29213

Determination of MIC's

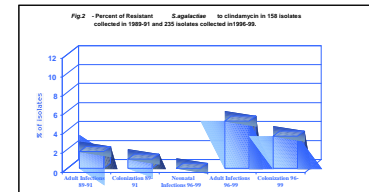
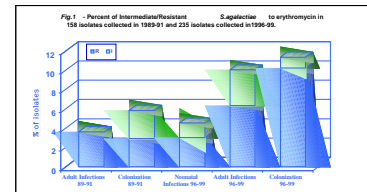
Susceptibilities to penicillin, ampicillin, ceftriaxone, vancomycin, erythromycin, ciprofloxacin, rifampicin, gentamicin, amikacin and tetracyclines were determined by the agar dilution technique according to criteria from the National Committee for Clinical Laboratory Standards, guidelines M-100-S8, for interpretation.

For clindamycin, susceptibility was evaluated by disk diffusion (2 μ g ; BBL). For all strains presenting a reduced susceptibility and for those which were intermediate or resistant to erythromycin, MIC's were further determined by the Etest technique (AB Biodisk, Sweden).

RESULTS

Table 1: Susceptibility profile and MIC 's (mg/L) of several antimicrobial agents for 393 *S.agalactiae* isolates from Belgium (158 isolates collected in 1989-91 vs. 235 isolates collected in 1996-99)

Antimicrobial agent	% Resistant isolates		% Intermediate isolates		MIC90	
	1989 - 91	1996 - 99	1989 - 91	1996 - 99	1989 - 91	1996 - 99
Penicillin	0	0	0	0	\leq 0.062	\leq 0.062
Ampicillin	0	0	0	0	\leq 0.062	\leq 0.062
Ceftriaxone	0	0	0	0	\leq 0.062	\leq 0.062
Vancomycin	0	0	0	0	0.25	0.25
Erythromycin	3.2	6.8	1.9	2.1	0.125	0.25
Clindamycin	1.3	3	0	0		
Ciprofloxacin	0	0	0	0	\leq 0.5	\leq 0.5
Rifampicin	0	0	0	0	0.125	0.125
Gentamicin	HLR: 0	HLR: 0			8	8
Amikacin	HLR: 0	HLR: 0			8	16
Tetracycline	82.9	82.1	0	0	\geq 8	\geq 8



INTRODUCTION

Streptococcus agalactiae (GBS) continues to be the major cause of early onset infectious disease (EOD) in neonates, but it is also responsible for late onset disease (LOD) in neonates and for severe infections among adults.

Associated with high mortality and morbidity, empiric therapy is usually started before availability of susceptibility results and most of EOD can be prevented through intrapartum chemoprophylaxis. Furthermore, increasing resistance in streptococci is currently becoming recognized, therefore surveillance for emerging resistance among GBS has to be conducted.

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DISCUSSION AND CONCLUSION

To prevent EOD in neonates, intrapartum chemoprophylaxis with penicillin or ampicillin is recommended; alternatively for penicillin allergic patient, clindamycin or erythromycin is used. And, for empiric therapy, penicillin and an aminoglycoside are frequently used for management of serious infections. As tolerance to penicillin, increased resistance to erythromycin - clindamycin and high level of resistance (HLR) to aminoglycosides are reported for GBS, our study was designed to determine and to compare susceptibilities of Belgian GBS isolates collected recently to isolates collected between 1989 - 91.

- ◆ No significant change was observed in the in vitro susceptibility of GBS strains to the 11 tested antibiotics.
- ◆ All isolates have remained uniformly susceptible to β -lactam antibiotics.
- ◆ No strains with HLR to aminoglycosides was detected.
- ◆ An increasing trend in the isolation rate of erythromycin resistant strains is shown.
- ◆ Ongoing monitoring for resistance and mechanisms of resistance to erythromycin and clindamycin is imperative.