West Middlesex University Hospital

Topic: Frequency of Clindamycin Resistance in Group B Strep

Date of Search: 10/06/2016

Sources Searched:
Medline
Embase
Public Health England
NHS Evidence

Summary:
The proportion of GBS bacteraemia reports (England, Wales and Northern Ireland) in 2014 accompanied by antimicrobial susceptibility test result data was 38%, 61% and 65% for clindamycin, erythromycin and tetracycline respectively. Clindamycin and erythromycin resistance increased in GBS bacteraemia isolates between 2010 and 2014, from 8% and 15% in 2010 to 18% and 23% resistant in 2014 respectively (table 3 below). Tetracycline resistance in GBS bacteraemia reports remains above 80% in 2014.

Table 3. Antimicrobial susceptibility for pyogenic streptococci causing bacteraemia, England, Wales and Northern Ireland; 2010 to 2014

		2010		2011		2012		2013		2014	
		No. tested	% resistant (R)	No. Tested	% R	No. Tested	% R	No. Tested	% R	No. Tested	% R
Group A	clindamycin	421	3%	463	3%	501	4%	677	4%	575	4%
	erythromycin	935	5%	851	5%	799	5%	955	5%	771	7%
	tetracycline	829	8%	726	13%	737	11%	891	10%	795	10%
Group B	clindamycin	452	8%	542	17%	620	13%	598	18%	634	18%
	erythromycin	1100	15%	1054	18%	1069	19%	1039	22%	1030	23%
	tetracycline	1011	82%	1004	83%	1016	85%	1008	86%	1089	83%
Group C	clindamycin	121	12%	182	12%	223	12%	258	13%	323	13%
	erythromycin	324	14%	325	18%	401	24%	393	23%	479	22%
	tetracycline	284	26%	275	27%	375	32%	386	30%	504	33%
Group G	clindamycin	226	8%	283	12%	327	20%	321	18%	387	22%
	erythromycin	648	26%	651	32%	621	37%	624	37%	633	38%
	tetracycline	569	48%	581	49%	561	50%	608	47%	692	52%

Source: *PHE. Voluntary surveillance of pyogenic and non-pyogenic streptococcal bacteraemia in England, Wales and Northern Ireland:* 2014. Health protection Report [serial online] 2015 [10/06/2016]; 9(44): infection report.
URL: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/478808/hpr4115_strptcccs.pdf

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Database Search History:

1. EMBASE; exp CLINDAMYCIN/; 40284 results.
2. EMBASE; Clindamycin.ti,ab; 10471 results.
3. EMBASE; 1 OR 2; 41816 results.
4. EMBASE; exp STREPTOCOCCUS AGALACTIAE/; 10209 results.
5. EMBASE; "group B strep*".ti,ab; 6695 results.
6. EMBASE; 4 OR 5; 11607 results.
7. EMBASE; resist*.ti,ab; 943383 results.
8. EMBASE; exp ANTIBIOTIC RESISTANCE/; 125355 results.
9. EMBASE; 7 OR 8; 977408 results.
10. EMBASE; pregn*.ti,ab; 499032 results.
11. EMBASE; exp PREGNANCY/; 617002 results.
12. EMBASE; 10 OR 11; 790077 results.
13. EMBASE; 3 AND 6 AND 9 AND 12; 187 results.
14. EMBASE; 1 AND 4 AND 8 AND 11; 46 results.
15. EMBASE; (Clindamycin adj2 resist*).ti,ab; 1363 results.
16. EMBASE; 12 AND 15; 73 results.
17. EMBASE; 9 AND 16; 73 results.
18. Medline; Clindamycin.ti,ab; 8598 results.
19. Medline; exp CLINDAMYCIN/; 5119 results.
20. Medline; 18 OR 19; 10147 results.
21. Medline; exp STREPTOCOCCUS AGALACTIAE/; 6949 results.
22. Medline; "group B strep*".ti,ab; 5919 results.
23. Medline; 21 OR 22; 8460 results.
24. Medline; resist*.ti,ab; 780120 results.
25. Medline; exp DRUG RESISTANCE, MICROBIAL/; 135845 results.
26. Medline; 24 OR 25; 815344 results.
27. Medline; pregn*.ti,ab; 403251 results.
28. Medline; exp PREGNANCY/; 786757 results.
29. Medline; 27 OR 28; 868694 results.
30. Medline; 20 AND 23 AND 26 AND 29; 133 results.
31. EMBASE; Clindamycin.ti; 2395 results.
32. EMBASE; 6 AND 9 AND 12 AND 31; 8 results.

Results:

Title: Antibiotic resistance profile and capsular serotyping of streptococcus agalactiae isolated from pregnant women between 35 to 37 weeks of pregnancy

Citation: Koomesh, December 2016, vol./is. 17/2(352-357), 1608-7046 (Winter 2016)

Author(s): Bornasi H., Rad E.G., Fard-Mousavi N., Zand S., Abtahi H.

Language: Persian

Abstract: Introduction: Streptococcus agalactiae (streptococcus group B (GBS)) is the natural inhabitants of the gastrointestinal and genitourinary tract and frequently is isolated from female reproductive tract. It is the most common cause of bacterial sepsis, meningitis, pneumonia and severe diseases in the newborn. Materials and Methods: Sixty Streptococcus agalactiae isolates were collected from 500 vaginal smear samples from pregnant women in their 35 to 37 weeks of pregnancy. The antibiotic susceptibility testing was performed by using disk diffusion method on Mueller Hinton agar medium with 5% sheep blood followed by capsular serotyping and PCR for 16Sr RNA, for final approval. Results: Antibiotic susceptibility test showed the lowest resistance was belong to Penicillin, ampicillin, vancomycin (0%), cefazolin (3/33%) and ceftazidime (5%).While the highest resistance was found for erythromycin (28/33%), clindamycin (15%) and tetracycline (96/66%) antibiotics. The frequency of capsular serotypes was as following: III=45%, Ia=18/33%, II=16/66%, V=13/33% and Ib=5%. Conclusion: Based on the current study, high raise in GBS isolates resistance to erythromycin and clindamycin in pregnant women (within the 35-37th weeks of pregnancy) is alarming and Markazi province demands for an expanded screening program in the ground of their GBS preventative plan.

Publication Type: Journal: Article

Source: EMBASE

Title: Maternal sepsis incidence, aetiology and outcome for mother and fetus: A prospective study

Citation: BJOG: An International Journal of Obstetrics and Gynaecology, April 2015, vol./is. 122/5(663-671), 1470-0328;1471-0528 (01 Apr 2015)

Author(s): Knowles S.J., O'Sullivan N.P., Meenan A.M., Hanniffy R., Robson M.

Language: English

Abstract: Objective To determine the incidence of maternal bacteraemia during pregnancy and for 6 weeks postpartum, describe the gestation/stage at which sepsis occurs, the causative microorganisms, antibiotic resistance and review maternal, fetal and neonatal outcome. Design Prospective review. Setting Two tertiary referral, maternity hospitals in Dublin, Ireland. Population During 2005-2012 inclusive, 150 043 pregnant women attended and 24.4% of infants born in Ireland were delivered at the hospitals. Methods Demographic,

clinical, microbiological and outcome data was collected from women with sepsis and compared with controls. Main outcome measures Incidence, bacterial aetiology, gestation/stage at delivery, mode of delivery, antibiotic resistance, admission to augmented care, maternal, fetal and neonatal outcome. Results The sepsis rate was 1.81 per 1000 pregnant women. Escherichia coli was the predominant pathogen, followed by Group B Streptococcus. Sepsis was more frequent among nulliparous women (odds ratio [OR] 1.39; 95% confidence interval [CI] 1.07-1.79) and multiple births (OR 2.04; 95% CI 0.98-4.08). Seventeen percent of sepsis episodes occurred antenatally, 36% intrapartum and 47% postpartum. The source of infection was the genital tract in 61% (95% CI 55.1-66.6) of patients and the urinary tract in 25% (95% CI 20.2-30.5). Sepsis was associated with preterm delivery (OR 2.81; 95% CI 1.99-3.96) and a high perinatal mortality rate (OR =5.78; 95% CI 2.89-11.21). Almost 14% of women required admission to augmented care. The most virulent organisms were Group A Streptococcus linked to postpartum sepsis at term and preterm Escherichia coli sepsis. Conclusions Maternal sepsis is associated with preterm birth, a high perinatal mortality rate and nulliparous women.

Publication Type: Journal: Article

Source: EMBASE

Title: Antibiotic resistance patterns among group B Streptococcus isolates: implications for antibiotic prophylaxis for early-onset neonatal sepsis

Citation: Swiss medical weekly, 2013, vol./is. 143/(w13778), 1424-3997 (2013)

Author(s): Capanna F., Emonet S.P., Cherkaoui A., Irion O., Schrenzel J., Martinez de Tejada B.

Language: English

Abstract: STUDY/PRINCIPLES: Antibiotic prophylaxis of Group B Streptococcus (GBS) positive women during labour reduces the risk of early-onset neonatal sepsis. Penicillin is the first choice, and clindamycin and erythromycin are second choices for penicillin-allergic women. Resistance to these antibiotics is rising. The aims of this study were to evaluate the rates of clindamycin and erythromycin resistance among GBS-positive isolates cultures from pregnant women in the University Hospital of Geneva and to evaluate the legitimacy of new Centres for Disease Control and Prevention (CDC) recommendations for our context.METHODS: We collected a vagino-rectal swab from pregnant women at 35-37 weeks gestation. We recovered 124 GBS positive isolates. Identification was based on the characteristic of the colony on the chromogenic agar, the streptococcal agglutination test and confirmation by mass spectrometry. Antimicrobial susceptibility was determined by disk diffusion, according to CLSI guidelines 2010.RESULTS: The rate of resistance to clindamycin was 28% and to erythromycin was 30%. Only 3 of the 38 erythromycin resistant strains (7.9%) were susceptible to clindamycin, and only 3 out of the 35 clindamycin resistant GBS

(8.6%) were identified as "inducible resistance". The rate of co-resistance to clindamycin of erythromycin-resistant strains was 92%. Penicillin remained efficacious in all cases.CONCLUSION: Rates of clindamycin and erythromycin resistance are also increasing in our context. These antibiotics should not be used for GBS neonatal sepsis prevention, without adequate antimicrobial susceptibility testing. In case of penicillin allergy and lack of antibiogramm, cephalosporins or vancomycin should be used as recommended in CDC guidelines.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *Free Access Content* in Swiss Medical Weekly

Title: High prevalence of Streptococcus agalactiae from vaginas of women in Taiwan and its mechanisms of macrolide and quinolone resistance

Citation: Journal of Microbiology, Immunology and Infection, October 2015, vol./is. 48/5(510-516), 1684-1182;1995-9133 (October 2015)

Author(s): Lee W.-T., Lai M.-C.

Language: English

Abstract: Background/Purpose: Streptococcus agalactiae (GBS), is the most common pathogen causing infections among perinatal women and neonatal babies. Nonetheless, there are few studies on the occurrence of GBS among the pregnant women and the mechanisms of GBS resistance to quinolones and macrolides in Taiwan. Methods: GBS were isolated from vaginas of the pregnant and non-pregnant symptomatic women in Taiwan. The prevalence, antimicrobial susceptibility, and mechanisms of resistance against erythromycin and quinolone of total 188 isolates were studied. Results: The isolation rate of GBS from pregnant women was significantly higher at 21.8% compare with the non-pregnant women of 13.2%. Antibiotic susceptibility test of the 188 GBS isolates revealed a high non-susceptible rate for erythromycin (50.0%) while the rate for levofloxacin was only 4.8%. Among 94 erythromycin non-susceptible GBS isolates, ermB gene was detected 83.1% (59/71) for those GBS that were non-susceptible to both clindamycin and tetracycline, which was significantly higher than GBS that are susceptible to clindamycin but resistant to tetracycline at 43.8% (7/16). No ermA or mef gene was detected in any isolate. Mutations were detected in the parC and gyrA genes in 14 out of 18 levofloxacin non-susceptible isolates. The predominant mutation type was the combination of Ser79Tyr in parC and Ser81Leu mutations in gyrA. Conclusion: GBS is the most common isolated pathogens in vaginal infections in Taiwan, resistance to tetracycline and erythromycin is higher than the rate observed for other regions of the world**,** while the resistance rate for levofloxacin was relatively lower in Taiwan.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *Free Access Content* in Journal of Microbiology, Immunology and Infection

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Title: Decreased susceptibility to clindamycin, erythromycin and tetracycline of streptococcus agalactiae isolated from vaginal samples

Citation: Acta Microbiologica Hellenica, July 2015, vol./is. 60/3(180), 0438-9573 (July-September 2015)

Author(s): Evangelia K., Elisavet S., Iliana T., Evi C., Ioanna T., Vassiliki G., Stavroula B.

Language: English

Abstract: Object of the research: Streptococcus agalactiae has been associated with neonatal infections through vertical transmission and vaginitis in both adults and children. We aimed to evaluate its prevalence in vaginal secretions from different symptomatic patients. Materials and methods: A total of 1,618 vaginal cultures were obtained from outpatients presenting with symptoms of vaginitis, from October 2013 to May 2015. The cases were divided into four age groups: 183 girls (2-17y), 766 non pregnant reproductive age women (18-40y), 404 pregnant women and 265 menopausal women (50-65y). All samples were inoculated onto appropriate media and incubated for 24 hours under aerobic conditions. The identification of isolated strains and their susceptibility test to antibiotics were carried out with the API System and the automated system VITEK 2 (BioMerieux, Marcy l' Etoile, France). Results: S. agalactiae was isolated from 38 (2.3%) patients and specifically from 2/183 (1.0%) girls, 21/766 (2.7%) non pregnant women of reproductive age, 9/404 (2.2%) pregnant women and 6/265 (2.3%) menopausal women. All isolates were penicillin susceptible, whereas the resistance rates for clindamycin, erythromycin and tetracycline were strikingly high. Conclusions: S. agalactiae isolation rate was comparable between groups. The significant decreased susceptibility to clindamycin and erythromycin interferes with treatment options, especially in patients with penicillin allergy. These results emphasize the need to monitor the epidemiology of S. agalactiae resistance to antimicrobials.

Publication Type: Journal: Conference Abstract

Source: EMBASE

Title: Serotypes, antibiotic susceptibilities, and multi-locus sequence type profiles of Streptococcus agalactiae isolates circulating in Beijing, China

Citation: PLoS ONE, March 2015, vol./is. 10/3(no pagination), 1932-6203 (17 Mar 2015)

Author(s): Wang P., Tong J.-J., Ma X.-H., Song F.-L., Fan L., Guo C.-M., Shi W., Yu S.-J., Yao K.-H., Yang Y.-H.

Language: English

Abstract: Background: To investigate the serotypes, antibiotic susceptibilities, and multi-locus sequence type (MLST) profiles of Streptococcus agalactiae (S. agalactiae) in Beijing to provide references for the prevention and treatment of S. agalactiae infections. Methods: All isolates were identified using the CAMP test and the latex-agglutination assay and serotyped using a Strep-B-Latex kit, after which they were assessed for antibiotic susceptibility, macrolide-resistance genes, and MLST profiles. Results: In total, 56 S. agalactiae isolates were identified in 863 pregnant women (6.5%). Serotypes Ia, Ib, II, III, and V were identified, among which types III (32.1%), Ia (17.9%), Ib (16.1%), and V (14.3%) were the predominant serotypes. All isolates were susceptible to penicillin and ceftriaxone. The nonsusceptiblity rates measured for erythromycin, clarithromycin, azithromycin, telithromycin, clindamycin, tetracycline, and levofloxacin were 85.7%, 92.9%, 98.2%, 30.4%, 73.2%, 91%, and 39.3%, respectively. We identified 14 sequence types (STs) for the 56 isolates, among which ST19 (30.4%) was predominant. The rate of fluoroquinolone resistance was higher in serotype III than in the other serotypes. Among the 44 erythromycin-resistant isolates, 32 (72.7%) carried ermB. Conclusion: S. agalactiae isolates of the serotypes Ia, Ib, III, and V are common in Beijing. Among the S. agalactiae isolates, the macrolide and clindamycin resistance rates are extremely high. Most of the erythromycin-resistant isolates carry ermB.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *National Library of Medicine* in PLoS ONE
Available from *ProQuest* in PLoS One
Available from *National Library of Medicine* in PLoS ONE
Available from *Allen Press* in PLoS One

Title: Antibiotic resistance of Streptococcus agalactiae isolated from pregnant women in Garankuwa, South Africa.

Citation: BMC research notes, Jan 2015, vol. 8, p. 364., 1756-0500 (2015)

Author(s): Bolukaoto, John Y, Monyama, Charles M, Chukwu, Martina O, Lekala, Sebotse M, Nchabeleng, Maphoshane, Maloba, Motlatji R B, Mavenyengwa, Rooyen T, Lebelo, Sogolo L, Monokoane, Sam T, Tshepuwane, Charles, Moyo, Sylvester R

Abstract: This study was undertaken to determine the susceptibility profile and the mechanism of antibiotic resistance in Group B streptococcus (GBS) isolates detected in vaginal and rectal swabs from pregnant women attending Dr George Mukhari Academic Hospital, a University Teaching Hospital in Pretoria, South Africa. The samples were

collected over an 11-month period, cultured on selective media (colistin and nalidixic acid agar and Todd-Hewitt broth), and GBS positively identified by using different morphological and biochemical tests. The susceptibility testing was done using the Kirby-Bauer and E test methods according to CLSI guidelines 2012. The D test method was used for the detection of inducible clindamycin resistance. Multiplex PCR with specific primers was used to detect different genes coding for resistance. Out of 413 samples collected, 128 (30.9%) were positive with GBS. The susceptibility testing revealed that 100% of isolates were sensitive to penicillin, ampicillin, vancomycin and high level gentamicin. Erythromycin and clindamycin resistance was 21.1 and 17.2%, respectively, in which 69% had harboured constitutive macrolide, lincosamide and streptogramin B (MLS(B)), 17.4% had inducible MLS(B). The M and L phenotypes were present in 6.8% each. The methylation of target encoded by ermB genes was the commonest mechanism of resistance observed in 55% of isolates, 38% of isolates had both ermB and linB genes and efflux pump mediated by mefA genes was also distributed among the isolates. The study reaffirmed the appropriateness of penicillin as the antibiotic of choice for treating GBS infection. However it identified the challenges of resistance to macrolides and lincosamides used as alternative drugs for individuals allergic to penicillin. More GBS treatment options for penicillin allergic patients need to be researched on.

Source: Medline

Full Text:
Available from *National Library of Medicine* in BMC Research Notes
Available from *BioMed Central* in BMC Research Notes
Available from *National Library of Medicine* in BMC Research Notes
Available from *ProQuest* in BMC Research Notes

Title: Serotypes, antibiotic susceptibilities, and multi-locus sequence type profiles of Streptococcus agalactiae isolates circulating in Beijing, China.

Citation: PloS one, Jan 2015, vol. 10, no. 3, p. e0120035., 1932-6203 (2015)

Author(s): Wang, Ping, Tong, Jing-jing, Ma, Xiu-hua, Song, Feng-li, Fan, Ling, Guo, Cui-mei, Shi, Wei, Yu, Sang-jie, Yao, Kai-hu, Yang, Yong-hong

Abstract: To investigate the serotypes, antibiotic susceptibilities, and multi-locus sequence type (MLST) profiles of Streptococcus agalactiae (S. agalactiae) in Beijing to provide references for the prevention and treatment of S. agalactiae infections. All isolates were identified using the CAMP test and the latex-agglutination assay and serotyped using a Strep-B-Latex kit, after which they were assessed for antibiotic susceptibility, macrolide-resistance genes, and MLST profiles. In total, 56 S. agalactiae isolates were identified in 863 pregnant women (6.5%). Serotypes Ia, Ib, II, III, and V were identified, among which types III (32.1%), Ia (17.9%), Ib (16.1%), and V (14.3%) were the predominant serotypes. All isolates were susceptible to penicillin and ceftriaxone. The nonsusceptiblity rates measured for erythromycin, clarithromycin, azithromycin, telithromycin, clindamycin, tetracycline, and levofloxacin were 85.7%, 92.9%, 98.2%, 30.4%, 73.2%, 91%, and 39.3%, respectively. We identified 14 sequence types (STs) for the 56 isolates, among which ST19 (30.4%) was

predominant. The rate of fluoroquinolone resistance was higher in serotype III than in the other serotypes. Among the 44 erythromycin-resistant isolates, 32 (72.7%) carried ermB. S. agalactiae isolates of the serotypes Ia, Ib, III, and V are common in Beijing. Among the S. agalactiae isolates, the macrolide and clindamycin resistance rates are extremely high. Most of the erythromycin-resistant isolates carry ermB.

Source: Medline

Full Text:
Available from *National Library of Medicine* in PLoS ONE
Available from *ProQuest* in PLoS One
Available from *National Library of Medicine* in PLoS ONE
Available from *Allen Press* in PLoS One

Title: Virulence factors, antimicrobial susceptibility and molecular characterization of Streptococcus agalactiae isolated from pregnant women.

Citation: Acta microbiologica et immunologica Hungarica, Dec 2014, vol. 61, no. 4, p. 425-434, 1217-8950 (December 2014)

Author(s): Beigverdi, Reza, Jabalameli, Fereshteh, Mirsalehian, Akbar, Hantoushzadeh, Sedigheh, Boroumandi, Shahram, Taherikalani, Morovat, Emaneini, Mohammad

Abstract: Forty-one Streptococcus agalactiae isolates collected from pregnant women at 35-37 weeks of gestation were analysed for their capsular types, antimicrobial resistance determinants, distribution of virulence factors and genetic relatedness using PCR and multiplex PCR. Capsular type III was predominant (65.8%), followed by capsular type II (14.6%), Ib (7.3%), and V(4.9%). All isolates were susceptible to penicillin, vancomycin, linezolid and quinupristin-dalfopristin. Resistance to tetracycline, erythromycin and clindamycin were found in 97.6%, 24.4%, and 14.6% of isolates, respectively. The most common antimicrobial resistance gene was tetM found in 97.6% of the isolates followed by ermTR and ermB found in 12% and 7.3% of isolates, respectively. The most common virulence gene was hly (100%), followed by scpB (97.6%), bca (97.6%), rib (53.65%) and bac (4.9%). The insertion sequence IS1548 was found in 63.4% of isolates. By multi locus variable number of tandem repeat analysis (MLVA) typing, 30 different allelic profiles or MLVA types (MTs) were identified. The most frequent was the MT1 (5/41, 12.2%) and followed by MT2 (4/41, 9.75%). Our data revealed that population structure of these isolates is highly diverse and indicates different MLVA types.

Source: Medline

Title: Epidemiology of Group B streptococcus isolated from pregnant women in Beijing, China.

Citation: Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases, Jun 2014, vol. 20, no. 6, p. O370., 1469-0691 (June 2014)

Author(s): Lu, B, Li, D, Cui, Y, Sui, W, Huang, L, Lu, X

Abstract: Group B Streptococcus (GBS) was the main causative organism of invasive infections in newborns due to vertical transmission from the colonized mothers. The study was undertaken to determine colonization rate, serotype distribution, genotypic characterization, antibiotic susceptibility profiles and molecular characteristics of erythromycin-resistant strains of GBS in pregnant women in Beijing, China. Vaginal-rectal swabs were collected from a total of 2850 pregnant women at 35-37 weeks of gestation, in which 7.1% were GBS positive. Serotypes III, Ia and V predominated. All isolates were penicillin susceptible, whereas the resistance rates for erythromycin and clindamycin were strikingly high. © 2013 The Authors Clinical Microbiology and Infection © 2013 European Society of Clinical Microbiology and Infectious Diseases.

Source: Medline

Title: First clinical isolate in Europe of clindamycin-resistant group B Streptococcus mediated by the lnu(B) gene.

Citation: Revista española de quimioterapia : publicación oficial de la Sociedad Española de Quimioterapia, Jun 2014, vol. 27, no. 2, p. 106-109, 1988-9518 (June 2014)

Author(s): Arana, David M, Rojo-Bezares, Beatriz, Torres, Carmen, Alós, Juan Ignacio

Abstract: We characterize the mechanisms implicated in an unusual phenotype of resistance to macrolides-lincosamides (no halos of inhibition around clindamycin and lincomycin discs, and a 15 mm halo around erythromycin disc) in a Streptococcus agalactiae isolate recovered in Spain. The presence of macrolide or lincosamide resistance genes [erm(A), erm(B), erm(C), erm(T), mef(A), mrs(A), lnu(A), lnu(B), lsa(B), lsa(C) and vga(C)] was investigated by PCR and sequencing. The strain showed a resistant phenotype to erythromycin and clindamycin (MIC = 2 mg/L and MIC = 8 mg/L, respectively) and the presence of lnu(B) and mef(A) genes was demonstrated. Clinical microbiology laboratories should be aware of this unusual phenotype due to the association of two mechanisms mediated by lnu(B) and mef(A) genes. This constitute, to our knowledge, the first report of lnu(B) in S. agalactiae in human isolates in Europe.

Source: Medline

Title: Streptococcus agalactiae in Brazil: serotype distribution, virulence determinants and antimicrobial susceptibility.

Citation: BMC infectious diseases, Jan 2014, vol. 14, p. 323., 1471-2334 (2014)

Author(s): Dutra, Vanusa G, Alves, Valéria M N, Olendzki, André N, Dias, Cicero A G, de Bastos, Alessandra F A, Santos, Gianni O, de Amorin, Efigênia L T, Sousa, Meireille Â B, Santos, Rosemary, Ribeiro, Patricia C S, Fontes, Cleuber F, Andrey, Marco, Magalhães, Kedma, Araujo, Ana A, Paffadore, Lilian F, Marconi, Camila, Murta, Eddie F C, Fernandes, Paulo C, Raddi, Maria S G, Marinho, Penélope S, Bornia, Rita B G, Palmeiro, Jussara K, Dalla-Costa, Libera M, Pinto, Tatiana C A, Botelho, Ana Caroline N, Teixeira, Lúcia M, Fracalanzza, Sérgio Eduardo L

Abstract: Group B Streptococcus (GBS) remains a major cause of neonatal sepsis and is also associated with invasive and noninvasive infections in pregnant women and non-pregnant adults, elderly and patients with underlying medical conditions. Ten capsular serotypes have been recognized, and determination of their distribution within a specific population or geographical region is important as they are major targets for the development of vaccine strategies. We have evaluated the characteristics of GBS isolates recovered from individuals with infections or colonization by this microorganism, living in different geographic regions of Brazil. A total of 434 isolates were identified and serotyped by conventional phenotypic tests. The determination of antimicrobial susceptibility was performed by the disk diffusion method. Genes associated with resistance to erythromycin (ermA, ermB, mefA) and tetracycline (tetK, tetL, tetM, tetO) as well as virulence-associated genes (bac, bca, lmb, scpB) were investigated using PCR. Pulsed-field gel electrophoresis (PFGE) was used to examine the genetic diversity of macrolide-resistant and of a number of selected macrolide-susceptible isolates. Overall, serotypes Ia (27.6%), II (19.1%), Ib (18.7%) and V (13.6%) were the most predominant, followed by serotypes IV (8.1%) and III (6.7%). All the isolates were susceptible to the beta-lactam antimicrobials tested and 97% were resistant to tetracycline. Resistance to erythromycin and clindamycin were found in 4.1% and 3% of the isolates, respectively. Among the resistance genes investigated, tetM (99.3%) and tetO (1.8%) were detected among tetracycline-resistant isolates and ermA (39%) and ermB (27.6%) were found among macrolide-resistant isolates. The lmb and scpB virulence genes were detected in all isolates, while bac and bca were detected in 57 (13.1%) and 237 (54.6%) isolates, respectively. Molecular typing by PFGE showed that resistance to erythromycin was associated with a variety of clones. These findings indicate that GBS isolates circulating in Brazil have a variety of phenotypic and genotypic characteristics, and suggest that macrolide-resistant isolates may arise by both clonal spread and independent acquisition of resistance genes.

Source: Medline

Title: Serotype distribution and antimicrobial susceptibility of group B streptococci in pregnant women: results from a Swiss tertiary centre

Citation: Swiss medical weekly, 2014, vol./is. 144/(w13935), 1424-3997 (2014)

Author(s): Frohlicher S., Reichen-Fahrni G., Muller M., Surbek D., Droz S., Spellerberg B., Sendi P.

Language: English

Abstract: To evaluate the rates of penicillin, clindamycin and erythromycin resistance and the serotype distribution among isolates of group B streptococcus (GBS) obtained from pregnant women at the University Hospital of Bern in Switzerland. We prospectively collected screening samples for GBS colonisation at the University Women's Hospital Bern, Switzerland, between March 2009 and August 2010. We included 364 GBS isolates collected from vaginal, cervical or vaginal-perianal swabs at any gestation time. The minimal inhibitory concentrations for penicillin, clindamycin and erythromycin were established using Etest with 24 hours of incubation, and inducible clindamycin resistance was tested with double disk diffusion tests. Serotyping was done with a rapid latex agglutination test or, if not conclusive, with polymerase chain-reaction (PCR) testing. We looked for significant associations between resistance patterns, age groups, serotype and ethnicity. All isolates were susceptible to penicillin. Resistance rates were 14.5% for erythromycin and 8.2% for clindamycin. Of 364 isolates, 5.8% were susceptible to clindamycin but not to erythromycin, although demonstrating inducible clindamycin resistance. Hence, the final reported clindamycin resistance rate was 14%. Serotype III was the most frequent serotype (29%), followed by V (25%) and Ia (19%). Serotype V was associated with erythromycin resistance ($p = 0.0007$). In comparison with all other ethnicities, patients from Asia showed a higher proportion of erythromycin and clindamycin resistance ($p = 0.018$). No significant association between resistance patterns and age groups was found. In pregnant women with GBS colonisation, penicillin is the antibiotic of choice for intrapartum prophylaxis to prevent neonatal early-onset GBS sepsis. In women with penicillin allergy and at high risk for anaphylactic reaction, clindamycin may be an alternative. The resistance rate for clindamycin at our institution was 14%; therefore, susceptibility must be tested before administration.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *Free Access Content* in Swiss Medical Weekly

Title: Antimicrobial susceptibility and genetic diversity of Streptococcus agalactiae recovered from newborns and pregnant women in Brazil

Citation: Scandinavian Journal of Infectious Diseases, October 2013, vol./is. 45/10(780-785), 0036-5548;1651-1980 (October 2013)

Author(s): Souza V.C., Kegele F.C.O., Souza S.R., Neves F.P.G., De Paula G.R., Barros R.R.

Language: English

Abstract: Background: Streptococcus agalactiae is known to be the major cause of neonatal infections and also causes complications during pregnancy. Methods: One hundred and six strains of Streptococcus agalactiae recovered from clinical specimens of newborns (n = 18) and pregnant women (n = 88) were submitted to antimicrobial susceptibility testing and investigation of genetic determinants of macrolide resistance, capsular type, and virulence factors. Genetic diversity was evaluated by pulsed-field gel electrophoresis (PFGE) analysis. Results: Strains were susceptible to ceftriaxone, levofloxacin, penicillin G, and vancomycin and resistant to tetracycline (85.8%) and erythromycin (4.7%). Erythromycin-resistant strains presented iMLSB phenotype, harbored the ermA gene, and were closely related by PFGE. Both bac and bca genes were found in low frequencies. PFGE analysis yielded 11 DNA restriction profiles among 35 selected isolates. The major clonal group, designated as A, was composed predominantly of strains belonging to capsular type Ia. Clonal group B was composed predominantly of strains with capsular type V, including all erythromycin-resistant isolates. Conclusions: Although low levels of erythromycin resistance have been observed, this is a fact of concern because this phenotype also confers resistance to clindamycin, an alternative agent for intrapartum prophylaxis. Despite the diversity of capsular types, Ia and V were among the most common and were significantly associated with distinct clonal groups. In a few cases, different capsular types were clustered into a single clonal group, which may be related to capsular switching. © 2013 Informa Healthcare.

Publication Type: Journal: Article

Source: EMBASE

Title: Risk factors associated with group B streptococcus resistant to clindamycin and erythromycin in pregnant korean women.

Citation: Infection & chemotherapy, Sep 2013, vol. 45, no. 3, p. 299-307, 2093-2340 (September 2013)

Author(s): Yook, Ji-Hyoung, Kim, Moon Young, Kim, Eun Ju, Yang, Jae Hyug, Ryu, Hyun-Mee, Oh, Kwan Young, Shin, Jung-Hwan, Foxman, Betsy, Ki, Moran

Abstract: The prevalence of group B streptococcus (GBS) among pregnant women and neonates in the Republic of Korea has increased. In addition, rates of resistance to antibiotics recommended for pregnant women allergic to penicillin, such as clindamycin and erythromycin, have increased. The aim of this study was to evaluate subject characteristics associated with GBS resistance to clindamycin and erythromycin. A total of 418 clinical

isolates from pregnant women in Korea were screened for antibiotic resistance from January 2006 to December 2011. Sociodemographic information, medical and obstetric history, and details of events during the previous 2 weeks were recorded using a standardized questionnaire. The resistance rates were 39.5% for clindamycin and 23.0% for erythromycin. In multiple logistic regression analysis, the subject characteristic significantly associated with resistance to both antibiotics was a history of symptomatic sore throat in the 2 weeks before obtaining the specimen (erythromycin: odds ratio [OR]: 2.13, 95% confidence interval [CI]: 1.10 to 4.13; clindamycin: OR: 2.31, 95% CI: 1.21, 4.42). Premature rupture of membranes (PROM) had an association of borderline significance. In the urgent treatment of GBS-colonized pregnant women, the subject's history of previous sore throat and PROM should be considered when choosing appropriate antibiotics.

Source: Medline

Full Text:
Available from *National Library of Medicine* in Infection and Chemotherapy

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Title: High rates of inducible clindamycin resistance among prenatal group B streptococcal isolates in one northwest Louisiana academic medical center.

Citation: Journal of clinical microbiology, Jul 2013, vol. 51, no. 7, p. 2469., 1098-660X (July 2013)

Author(s): Capraro, Gerald A, Rambin, Ellen D, Vanchiere, John A, Bocchini, Joseph A, Matthews-Greer, Janice M

Source: Medline

Full Text:
Available from *Free Access Content* in Journal of Clinical Microbiology
Available from *National Library of Medicine* in Journal of Clinical Microbiology
Available from *Highwire Press* in Journal of Clinical Microbiology
Available from *National Library of Medicine* in Journal of Clinical Microbiology

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Title: Outcomes of alternative antibiotic regimen in penicillin allergic pregnant women with group b streptococcal colonization of the birth canal

Citation: Journal of Investigative Medicine, April 2013, vol./is. 61/4(776-777), 1081-5589 (April 2013)

Author(s): Sundareshan V., Vishnumolakala P., Khardori N.

Language: English

Abstract: Background: Group B Streptococcal (GBS) infections are a leading cause of mortality in neonates acquiring infection through vertical transmission from mothers with vaginal colonization with the bacteria. Newborns may manifest with early-onset infections,

late onset infections or infections beyond early infancy as children. It is therefore recommended to screen pregnant women at 35- 37 weeks of gestation for colonization (estimated at less than 10%) for administration of prophylactic antibiotics given intrapartum. One hundred percent of GBS are known to be susceptible to penicillin which is the drug of choice for antibiotic prophylaxis in women colonized with GBS. However in women that are allergic to penicillin, susceptibility testing for clindamycin and erythromycin is performed. Clindamycin or erythromycin is recommended in penicillin allergic women with history of anaphylaxis. Alternatively, vancomycin should be used in penicillin allergic women with clindamycin and erythromycin resistance or unknown susceptibility. Objective: To study the pattern of antibiotics administered as prophylaxis for GBS colonization in pregnant woman allergic to penicillin that were admitted to Memorial Medical Center in 2011-2012 as well as compare clinical outcomes in their newborns. Methods: We conducted a retrospective chart review of pregnant women allergic to penicillin and colonized with GBS that were admitted between January 2011 and September 2012 to Memorial Medical Center as well as St. Johns Hospital in Springfield, IL. Outcome measures considered include clinical course in the pregnant women and incidence of early-onset infections in the newborns (bacteremia, septicemia without a focus, pneumonia and meningitis). The data on antibiotic susceptibilities was available from Clinical Microbiology Laboratory at Memorial Medical Center. Results: A total of 80 women were identified with stated penicillin allergy. 50 out of 80 women reported the type of allergy as an unknown type of reaction. 4 women who reported nausea with Penicillin were included as an allergic reaction and did not receive penicillin for prophylaxis. 56.2% of the isolates were resistant to clindamycin. 4 women received clindamycin although their isolate was resistant to clindamycin. Table 1 below summarizes the antibiotic usage in these women. There were no early or late infections identified in neonates of the women in whom these alternative antibiotics were used. Conclusion: This study elucidates that it is important to obtain a complete and accurate history of penicillin allergy in pregnant women withGBS colonization. In cases of unknown allergy to penicillin, there may be a role for penicillin skin testing to rule in true allergy. Despite specific protocols/guidelines and availability of susceptibility data, prophylactic antibiotic choices were not optimal. We also conclude that clindamycin and vancomycin are non inferior to betalactams for GBS in prophylaxis since there were no adverse outcomes in the neonates whose mothers received these intrapartum. (Table presented).

Publication Type: Journal: Conference Abstract

Source: EMBASE

Full Text:
Available from *Ovid* in Journal of Investigative Medicine

Title: Antibiotic resistance patterns among group B Streptococcus isolates: Implications for antibiotic prophylaxis for early-onset neonatal sepsis

Citation: Swiss Medical Weekly, March 2013, vol./is. 143/(no pagination), 1424-7860;1424-3997 (25 Mar 2013)

Author(s): Capannaa F., Emonet S.P., Cherkaoui A., Irion O., Schrenzel J., De Tejada B.M.

Language: English

Abstract: Study/principles: Antibiotic prophylaxis of Group B Streptococcus (GBS) positive women during labour reduces the risk of early-onset neonatal sepsis. Penicillin is the first choice, and clindamycin and erythromycin are second choices for penicillin-allergic women. Resistance to these antibiotics is rising. The aims of this study were to evaluate the rates of clindamycin and erythromycin resistance among GBS-positive isolates cultures from pregnant women in the University Hospital of Geneva and to evaluate the legitimacy of new Centres for Disease Control and Prevention (CDC) recommendations for our context. METHODS: We collected a vagino-rectal swab from pregnant women at 35-37 weeks gestation. We recovered 124 GBS positive isolates. Identification was based on the characteristic of the colony on the chromogenic agar, the streptococcal agglutination test and confirmation by mass spectrometry. Antimicrobial susceptibility was determined by disk diffusion, according to CLSI guidelines 2010. RESULTS: The rate of resistance to clindamycin was 28% and to erythromycin was 30%. Only 3 of the 38 erythromycin resistant strains (7.9%) were susceptible to clindamycin, and only 3 out of the 35 clindamycin resistant GBS (8.6%) were identified as 'inducible resistance'. The rate of co-resistance to clindamycin of erythromycin-resistant strains was 92%. Penicillin remained efficacious in all cases. CONCLUSION: Rates of clindamycin and erythromycin resistance are also increasing in our context. These antibiotics should not be used for GBS neonatal sepsis prevention, without adequate antimicrobial susceptibility testing. In case of penicillin allergy and lack of antibiogramm, cephalosporins or vancomycin should be used as recommended in CDC guidelines.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *Free Access Content* in Swiss Medical Weekly

Title: Carriage of group B streptococci in pregnant women from the region of Krakow and their antibiotic resistance in the years 2008-2012

Citation: Polish Journal of Microbiology, 2013, vol./is. 62/4(427-433), 1733-1331 (2013)

Author(s): Brzychczy-Wloch M., Ochonska D., Bulanda M.

Language: English

Abstract: The aim of the study was a retrospective analysis of the frequency of group B streptococci (Streptococcus agalactaie; GBS) carriage in pregnant women from the region of Krakow, together with an analysis of their drug resistance, carried out between 2008-2012. The study included 3363 pregnant women between 35 and 37 weeks of gestation, studied in accordance with the guidelines of the Polish Gynecological Society (2008). A high

percentage of pregnant women who are carriers of group B streptococci was demonstrated. Each year covered by the study, it was in the range of 25-30%, with an average value equal to 28%. The results confirm the need for taking swabs from both the vagina and anus, since 15% of GBS positive patients showed only rectal carriage. High percentage of isolates resistant to erythromycin was detected, which ranged from 22% to 29%, with an average value equal to 25%, as well as a high proportion of isolates resistant to clindamycin being 17-25%, with an average of 20%. The results indicate the need to standardize the methodology of collecting samples for GBS testing and introduce microbiological diagnostic standards in all gynecological and obstetric centers in Poland, in order to carry out a detailed epidemiological analysis in our country.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *Free Access Content* in Polish Journal of Microbiology

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Title: Penicillin susceptibility and macrolide-lincosamide-streptogramin B resistance in group B Streptococcus isolates from a Canadian hospital

Citation: Canadian Journal of Infectious Diseases and Medical Microbiology, December 2012, vol./is. 23/4(196-198), 1712-9532 (Winter 2012)

Author(s): Sherman K., Whitehead S., Blondel-Hill E., Wagner K., Cheeptham N.

Language: English

Abstract: BACKGROUND: Intrapartum antibiotic prophylaxis (IAP) is recommended for pregnant women who test positive for group B Streptococcus (GBS) in their genitourinary tract to prevent GBS-induced neonatal sepsis. Penicillin G is used as the primary antibiotic, and clindamycin or erythromycin as the secondary, if allergies exist. Decreased susceptibility to penicillin G has occasionally been reported; however, clindamycin and erythromycin resistance is on the rise and is causing concern over the use of clindamycin and erythromycin IAP. METHODS: Antibiotic resistance was characterized phenotypically using a D-Test for erythromycin and clindamycin, while an E-Test (E-strip) was used for penicillin G. GBS was isolated from vaginal-rectal swabs and serologically confirmed using Prolex (Pro-Lab Diagnostics, Canada) streptococcal grouping reagents. Susceptibility testing of isolates was performed according to the Clinical Laboratory Standards Institute guidelines. RESULTS: All 158 isolates were penicillin G sensitive. Inducible macrolide-lincosamide-streptogramin B (MLSB) resistance was observed in 13.9% of isolates. Constitutive MLSB resistance was observed in 12.7% of isolates. M phenotype resistance was observed in 6.3% of isolates. In total, erythromycin resistance was present in 32.9% of the GBS isolates, while clindamycin resistance was present in 26.6%. DISCuSSIoN: The sampled GBS population showed no sign of reduced penicillin susceptibility, with all being well under susceptible minimum inhibitory concentration values. These data are congruent with the large body of evidence showing that penicillin G remains the most reliable clinical antibiotic for IAP. Clindamycin and

erythromy-cin resistance was higher than expected, contributing to a growing body of evidence that suggests the re-evaluation of clindamycin and erythromycin IAP is warranted. © 2012 Pulsus Group Inc.

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Title: Point prevalence study of antibiotic susceptibility of genital group B streptococcus isolated from near-term pregnant women in Calgary, Alberta

Citation: Canadian Journal of Infectious Diseases and Medical Microbiology, September 2012, vol./is. 23/3(121-124), 1712-9532 (Autumn 2012)

Author(s): Church D., Carson J., Gregson D.

Language: English

Abstract: BACKGROUND: Genital group B streptococcus (GBS) may be transmitted from a colonized mother to her infant if appropriate intrapartum antibiotic prophylaxis is not given. A recent case of GBS neonatal sepsis occurred due to an erythromycin-intermediate strain after empirical use of this drug as intrapartum prophylaxis. OBJECTIVE: To determine the regional antibiotic resistance rates of genital GBS isolates to penicillin, erythromycin and clindamycin. METHODS: A total of 309 genital GBS strains cultured from vaginal/rectal swabs were prospectively isolated and randomly selected between March and May 2011. Etest strips (bioMerieux, France) were used to determine the minimum inhibitory concentrations to penicillin, erythromycin and clindamycin according to standard methods. All isolates that either demonstrated intermediate or full resistance to erythromycin had a D-test performed to detect inducible resistance to clindamycin. The resistance mechanism for each isolate was inferred from its antibiogram phenotype. Results: All genital GBS isolates were susceptible to penicillin, but high rates of resistance were found to both erythromycin (25%) and clindamycin (22%), mainly due to acquisition of erythromycin ribosomal methylation genes (erm) that result in the MLS<inf>B</inf> resistance phenotype. Most often the MLS<inf>B</inf> resistance phenotype was constitutive (MLS <inf>B</inf>-C; 14.2%) rather than inducible (MLS<inf>B</inf>-I; 8.1%), and an efflux mechanism (msrA; 3%) was much less common. Discussion: The present article is the first point prevalence study of genital GBS antibiogram profile that has been reported from a Canadian health care region. The high rates of resistance of genital GBS to both erythromycin and clindamycin is mainly due to the acquisition and spread of erm genes conveying the MSL<inf>B</inf> phenotype.

Conclusion: Changes to clinical and laboratory practice in the Calgary, Alberta, region were made to prevent additional cases of neonatal GBS sepsis due to inappropriate intrapartum antibiotic prescription. ©2012 Pulsus Group Inc. All rights reserved.

Publication Type: Journal: Article

Source: EMBASE

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Title: Prevention of perinatal group B streptococcal disease: Updated CDC guideline

Citation: American Family Physician, July 2012, vol./is. 86/1(59-65), 0002-838X;1532-0650 (July 2012)

Author(s): Cagno C.K., Pettit J.M., Weiss B.D.

Language: English

Abstract: Group B streptococcus is the leading cause of early-onset neonatal sepsis in the United States. Universal screening is recommended for pregnant women at 35 to 37 weeks' gestation. The Centers for Disease Control and Prevention recently updated its guideline for the prevention of early-onset neonatal group B streptococcal disease. The new guideline contains six important changes. First, there is a recommendation to consider using sensitive nucleic acid amplification tests, rather than just routine cultures, for detection of group B streptococcus in rectal and vaginal specimens. Second, the colony count required to consider a urine specimen positive is at least 10⁴ colony-forming units per mL. Third, the new guideline presents separate algorithms for management of preterm labor and preterm premature rupture of membranes, rather than a single algorithm for both conditions. Fourth, there are minor changes in the recommended dose of penicillin G for intrapartum chemoprophylaxis. Fifth, the guideline provides new recommendations about antibiotic regimens for women with penicillin allergy. Cefazolin is recommended for women with minor allergies. For those at serious risk of anaphylaxis, clindamycin is recommended if the organism is susceptible or if susceptibility is unknown, and vancomycin is recommended if there is clindamycin resistance. Finally, the new algorithm for secondary prevention of early-onset group B streptococcal disease in newborns should be applied to all infants, not only those at high risk of infection. The algorithm clarifies the extent of evaluation and duration of observation required for infants in different risk categories. © 2012 American Academy of Family Physicians.

Publication Type: Journal: Article

Title: Prevalence of Streptococcus agalactiae colonisation in pregnant women and antimicrobial resistance profiles

Citation: Clinical Microbiology and Infection, April 2012, vol./is. 18/(231-232), 1198-743X (April 2012)

Author(s): Prifti E., Papanagiotou A., Kyriakopoulos T.H., Vlachos S., Lianos S., Metzidaki E., Tsetsa P., Apostolou D., Tzanetou K.

Language: English

Abstract: Background: Group B Streptococcus (GBS) is a cause of early neonatal morbidity and mortality. Maternal vaginal colonization with GBS is a risk factor for invasive disease in the first week of newborn life. Objectives: To study the prevalence of vaginal colonization by GBS in pregnant women and to determine the antibiotic susceptibility pattern of the isolates. Material and methods: During a 2 year period from October 2009 through October 2011, 2793 pregnant women attending the department of Obstetrics and Gynecology of "Alexandra" Hospital of Athens were examined for GBS colonization as a part of routine culture of vaginal swabs for common bacterial and fungal pathogens. A vaginal swab obtained in Stuart transport medium was cultured onto Columbia CNA blood agar with colistin and nalidixic acid for Streptococcus isolation. A rapid latex agglutination test was performed for identification of Lancefield A, B, C, D, F and G group antigens of streptococci. Antibiotic susceptibility testing was performed by disc diffusion technique on Mueller-Hinton agar with 5% sheep blood according to CLSI recommendations and MICs were determined by Etest (AB Biodisk, Solna, Sweden). Results: During the study period 93 (3.33%) out of 2793 pregnant women were found positive for GBS. Susceptibility testing of 93 isolates to penicillin, ampicillin, erythromycin, clindamycin, tetracycline, levofloxacin, vancomycin and linezolid showed the following resistance rates: 0% (MICs of 0.094-0.12 mug/mL), 0% (MICs of 0.023-0.032 mug/mL), 26.88% (MICs >256 mug/mL), 19.36% (MICs >256 mug/mL), 92.48% (MICs of 8-12 mug/mL), 3.23% (MICs of 12-24 mug/mL), 0% (MICs of 0.75-1 mug/mL), and 0% (MICs of 0.75- 1.5 mug/mL) respectively. The susceptible isolates to penicillin can be considered susceptible to all beta-lactams (cefazolin cephalothin, cefuroxime, ceftriaxone, cefotaxime, cefepime, imipenem) according to CLSI guidelines. Inducible clindamycin resistance was not detected by D-test. Conclusions: (i) The prevalence of GBS in pregnant women of our study is low. (ii) Penicillin or ampicillin remain the drugs of choice for intrapartum antibiotic prophylaxis as isolates with increasing MICs to both agents were not detected. (iii) Clindamycin, the drug of choice for penicillin-allergic women at high risk for anaphylaxis, demonstrates a significant resistance rate. (d) GBS show an unusually very high resistance rate to tetracycline.

Publication Type: Journal: Conference Abstract

Source: EMBASE

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Title: High rates of perinatal group B Streptococcus clindamycin and erythromycin resistance in an upstate New York hospital.

Citation: Antimicrobial agents and chemotherapy, Feb 2012, vol. 56, no. 2, p. 739-742, 1098-6596 (February 2012)

Author(s): Back, Ephraim E, O'Grady, Elisa J, Back, Joshua D

Abstract: The objective of this study was to evaluate the rates of clindamycin and erythromycin resistance among group B Streptococcus (GBS)-positive isolates cultured from pregnant women in an upstate New York community hospital. All GBS-positive perinatal rectovaginal cultures obtained from January 2010 through October 2011 were tested for resistance to erythromycin and clindamycin. Among the 688 GBS-positive cultures, clindamycin resistance was found in 38.4% and erythromycin resistance was found in 50.7%. Rates of GBS resistance to clindamycin and erythromycin are much higher than reported in earlier U.S. studies, suggesting both increasing resistance and regional variation in resistance. These findings lend strong support to the CDC and American College of Obstetricians and Gynecologists (ACOG) recommendations that clindamycin use for intrapartum antibiotic prophylaxis be restricted to penicillin-allergic women at high risk of anaphylaxis and that GBS isolates be tested for antibiotic resistance prior to the use of clindamycin in these women.

Source: Medline

Full Text:
Available from *National Library of Medicine* in Antimicrobial Agents and Chemotherapy
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Available from *Highwire Press* in Antimicrobial Agents and Chemotherapy
Available from *Free Access Content* in Antimicrobial Agents and Chemotherapy

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Title: Capsular serotype and antibiotic resistance of group B streptococci isolated from pregnant women in Ardabil, Iran

Citation: Iranian Journal of Microbiology, 2012, vol./is. 4/3(130-135), 2008-3289;2008-4447 (2012)

Author(s): Arzanlou M., Jannati E., Roshani M., Habibzadeh S., Rahimi G., Shapuri R.

Language: English

Abstract: Background and Objectives: Group B Streptococci (GBS) is a major cause of neonatal and maternal infections. The aim of this study was to determine the serotype distribution and antibiotic resistance profile of GBS strains isolated from pregnant women in Ardabil. Materials and Methods: Antibiotic resistance of 56 GBS isolates was investigated using E-test strips and disk-diffusion method. Serotyping was performed using capsular antiserum. Results: The results of MIC tests showed all isolates were susceptible to ampicillin, vancomycin and penicillin. One isolate (1.7%) showed reduced susceptibility pattern to penicillin (MIC; 0.25 mug/ml). There were 3 (5.3%) isolates semi-sensitive (0.25-1 mug/ml) to erythromycin (2; 0.5 mug/ml and 1; 0.38 mug/ml) and 2 (3.5%) isolates to clindamycin (1; 0.5 mug/ml, 1; 0.38 mug/ml). Additionally, 2 (3.5%) isolates were resistant to clindamycin (1; 16 mug/ml, 1; 2 mug/ml). According to the disk diffusion test, 47 (83.9%), 8 (14.2%) and 7 (12.5%) isolates were resistant to Co-trimoxazole, ciprofloxacin and ceftriaxone respectively. Serotypes V (19.6%), II (12.5%) and IV (12.5%) were the most frequent followed by serotypes III (10.7%) and VI (10.7%), Ib (8.9%), Ia (7/1%), VII (5/3%) and VIII (5/3%); 7.1% of strains were nontypeable. Conclusions: In this study, most isolates were sensitive to common antibiotics, but increased resistance to other antibiotics indicates the importance of monitoring of antibiotic resistance in group B streptococci over time.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
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Title: Antibiotic resistance of Group Beta Streptococcus in Coastal North Carolina: Detection of penicillin resistance

Citation: American Journal of Obstetrics and Gynecology, January 2012, vol./is. 206/1 SUPPL. 1(S265-S266), 0002-9378 (January 2012)

Author(s): Mandel D., Patel A., Rickman C., Stinson J.

Language: English

Abstract: OBJECTIVE: Group Beta Streptococcus (GBS) is an important pathogen in both mother and neonate, causing significant morbidity and mortality. The antibiotic resistance profile for GBS may change given established recommendations including; 1) universal screening in pregnancy and use of antibiotics in colonized individuals during labor to reduce morbidity, 2) routine use of erythromycin in patients with premature rupture of membranes for prolongation of the latent period. The purpose of this study is to assess antibiotic resistance profiles for maternal GBS isolates in coastal North Carolina. STUDY DESIGN: Retrospective review at a single tertiary care center. ICD-9 codes were used to identify obstetrical deliveries occurring calendar year 2005-2009, collated by screening culture

result. All cases with positive culture results were subjected to medical record review to collect data on antibiotic sensitivity testing and population demographics. RESULTS: 20,042 obstetrical deliveries occurred during the five-year period under study. Carrier prevalence was 23.6% (n=4,738). Antibiotic sensitivity results were available for 812 isolates. 51.6% of isolates were universally-sensitive to penicillin, clindamycin, erythromycin and vancomycin. Individual antibiotic resistance prevalence rates were 3.7%, 25.2%, 46.4% and 0.0% respectively. Of those with penicillin resistance, 66.7% were also to resistant to clindamycin and erthyromycin. CONCLUSION: We report a regional subset of GBS isolates with penicillin resistance, and an increased rate of resistance to erythromycin comparative to other published reports. This may be due to established recommendations for antibiotic use, and/or actual antibiotic practice. The clinical implications of penicillin-resistance is unknown and further study is necessary to draw additional conclusions. (Table presented).

Publication Type: Journal: Conference Abstract

Source: EMBASE

Title: In vitro resistance to macrolides and clindamycin by group B streptococcus isolated from pregnant and nonpregnant women

Citation: Infectious Diseases in Obstetrics and Gynecology, 2012, vol./is. 2012/(no pagination), 1064-7449;1098-0997 (2012)

Author(s): Lambiase A., Agangi A., Del Pezzo M., Quaglia F., Testa A., Rossano F., Martinelli P., Catania M.R.

Language: English

Abstract: Background. Despite the introduction of screening bases intrapartum prophylaxis, Streptococcus agalactiae is still an important etiological agent of perinatal infections. The increasing rate of resistance and the differences in resistance pattern among countries suggest that a program of surveillance at the institutional level is important in determining optimal prophylaxis. In contrast, knowledge on GBS epidemiology in Italy is limited, and no data are available in the Southern region of the country. We sought to determine the occurrence of resistance to macrolides and clindamycin of GBS isolates in pregnant and nonpregnant women. Methods. Between 2005 and 2008, 1346 vaginal and 810 rectovaginal swabs were obtained from pregnant and not-pregnant women. Results. The occurrence of macrolides and clindamycin resistance was 16.5% in 2005 increasing up to 69.9% in 2008. A high percentage of isolates was resistant to tetracycline through all the study period with no statistically significant annual. Conclusions. In our cohort, an increase of in vitro resistance of GBS to macrolides and clindamycin is clearly evident. The discordance with reports from different countries emphasize the crucial role of microbiological methods in setting possible therapeutic strategies. Copyright © 2012 Antonietta Lambiase et al.

Publication Type: Journal: Article

Source: EMBASE

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Available from *National Library of Medicine* in Infectious Diseases in Obstetrics and Gynecology

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Title: Penicillin susceptibility and macrolide-lincosamide-streptogramin B resistance in group B Streptococcus isolates from a Canadian hospital.

Citation: The Canadian journal of infectious diseases & medical microbiology = Journal canadien des maladies infectieuses et de la microbiologie médicale / AMMI Canada, Jan 2012, vol. 23, no. 4, p. 196-198, 1712-9532 (2012)

Author(s): Sherman, Kevin, Whitehead, Sue, Blondel-Hill, Edith, Wagner, Ken, Cheeptham, Naowarat

Abstract: Intrapartum antibiotic prophylaxis (IAP) is recommended for pregnant women who test positive for group B Streptococcus (GBS) in their genitourinary tract to prevent GBS-induced neonatal sepsis. Penicillin G is used as the primary antibiotic, and clindamycin or erythromycin as the secondary, if allergies exist. Decreased susceptibility to penicillin G has occasionally been reported; however, clindamycin and erythromycin resistance is on the rise and is causing concern over the use of clindamycin and erythromycin IAP. Antibiotic resistance was characterized phenotypically using a D-Test for erythromycin and clindamycin, while an E-Test (E-strip) was used for penicillin G. GBS was isolated from vaginal-rectal swabs and serologically confirmed using Prolex (Pro-Lab Diagnostics, Canada) streptococcal grouping reagents. Susceptibility testing of isolates was performed according to the Clinical Laboratory Standards Institute guidelines. All 158 isolates were penicillin G sensitive. Inducible macrolide-lincosamide-streptogramin B (MLSB) resistance was observed in 13.9% of isolates. Constitutive MLSB resistance was observed in 12.7% of isolates. M phenotype resistance was observed in 6.3% of isolates. In total, erythromycin resistance was present in 32.9% of the GBS isolates, while clindamycin resistance was present in 26.6%. The sampled GBS population showed no sign of reduced penicillin susceptibility, with all being well under susceptible minimum inhibitory concentration values. These data are congruent with the large body of evidence showing that penicillin G remains the most reliable clinical antibiotic for IAP. Clindamycin and erythromycin resistance was higher than expected, contributing to a growing body of evidence that suggests the re-evaluation of clindamycin and erythromycin IAP is warranted.

Source: Medline

Full Text:
Available from *National Library of Medicine* in Canadian Journal of Infectious Diseases and Medical Microbiology = Journal Canadien des Maladies Infectieuses et de la Microbiologie Médicale / AMMI Canada, The

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Title: Group B Streptococcus in a cohort of HIV-infected pregnant women: prevalence of colonization, identification and antimicrobial susceptibility profile.

Citation: Scandinavian journal of infectious diseases, Sep 2011, vol. 43, no. 9, p. 742-746, 1651-1980 (September 2011)

Author(s): Joao, Esau C, Gouvêa, Maria Isabel, Menezes, Jacqueline A, Matos, Haroldo J, Cruz, Maria Letícia S, Rodrigues, Caio A S, de Souza, Maria José, Fracalanzza, Sergio E L, Botelho, Ana Caroline N, Calvet, Guilherme A, Grinsztejn, Beatriz Gilda J

Abstract: Group B Streptococcus (GBS) is a leading cause of infectious morbidity in newborns. We describe the prevalence of GBS colonization and the serotypes and antibiotic susceptibility profiles of isolates obtained from a cohort of human immunodeficiency virus (HIV)-infected pregnant women. This was a cross-sectional study at a centre for the prevention of mother-to-child transmission of HIV. Vaginal and rectal swabs were collected at 35-37 weeks of gestation from 158 eligible women. GBS isolates were serotyped and antimicrobial susceptibility tests performed. Patient sociodemographic characteristics, CD4 counts and viral loads were abstracted from records. The overall anogenital prevalence of GBS colonization was 49/158 (31.0%): 40/158 (25.3%) for vagina, 19/158 (12.0%) for rectum and 10/158 (6.3%) for both. Predominant serotypes were Ib (34.9%) and Ia (25.6%). All were penicillin-susceptible. Two were resistant to erythromycin (4.0%) and one to clindamycin (2.0%). The colonization rate by GBS was high in this cohort. Serotype Ib was the most frequently identified.

Source: Medline

Title: Genital tract group B streptococcal colonization in pregnant women: a South Indian perspective.

Citation: Journal of infection in developing countries, Aug 2011, vol. 5, no. 8, p. 592-595, 1972-2680 (August 2011)

Author(s): Sharmila, Vijayan, Joseph, Noyal Mariya, Arun Babu, Thirunavukkarasu, Chaturvedula, Latha, Sistla, Sujatha

Abstract: During the last few decades, group B Streptococcus (GBS) has emerged as an important pathogen. The major reservoirs for GBS are the vagina and the peri-anal regions/rectum, and the colonization of these regions is a risk factor for subsequent infection in pregnant women and newborns. A prospective study was performed to determine the prevalence of GBS colonization in the vagina and rectum of pregnant women and the antibiotic susceptibility pattern of the isolates. We also aimed to identify risk factors associated with GBS colonization. The vaginal and rectal swabs were inoculated in Todd-

Hewitt broth and later subcultured on blood agar for isolation of GBS. A total of 300 pregnant women were enrolled in the study. GBS strains were isolated from seven out of 300 patients, corresponding to a colonization rate of 2.3%. Of the seven patients carrying GBS, isolates were cultured only from vaginal swabs in two cases (28.6%), only from rectal swabs in two cases (28.6%) from both vaginal and rectal swabs in three cases (42.9%). Heavy colonization was present only in 42.9% (3/7) of antenatal women. None of the seven isolates were resistant to penicillin or clindamycin, while one isolate (14.3%) was resistant to erythromycin and five isolates (71.4%) were resistant to tetracycline. Multigravid women and those with previous spontaneous abortion were more frequently colonized by GBS. The GBS colonization rate in our study was low. No resistance to penicillin or clindamycin was seen, while the majority of the isolates were resistant to tetracycline.

Source: Medline

Full Text:
Available from *Free Access Content* in Journal of Infection in Developing Countries

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Title: Streptococcus agalactiae increase in resistance to erythromycin and clindamycin in vaginal-anal colonization in third quarter of pregnancy in one decade of universal screening

Citation: Revista Chilena de Infectologia, August 2011, vol./is. 28/4(334-337), 0716-1018 (August 2011)

Author(s): Fernando Abarzua C., Alejandra Arias E., Patricia Garcia C., Constanza Ralph T., Jaime Cerda L., Ingrid Riedel K., Cynthia Garate O.

Language: English, Spanish

Abstract: Streptococcus agalactiae (GBS) is the main causative agent of early perinatal sepsis. The acquisition of prevention policies has led to frequent use of intrapartum antibiotics. Surveillance of antimicrobial resistance is indispensable for defining drugs of choice and alternatives for such prophylaxis. Objectives: To determine the evolution of antimicrobial resistance of GBS from maternal colonization to drugs used in the prevention of neonatal sepsis, between 2002 and 2008. Methods: We studied 100 GBS positive vaginal and anal samples from pregnant women. Disc diffussion susceptibility method was performed for penicillin, ampicillin, cefazolin, erythromycin and clindamycin according to the Clinical and Laboratory Standards Institute (CLSI). Results: We analyzed the susceptibility of 99 strains. Seventeen were resistant to erythromycin (17.1%) and 13 were resistant to clindamycin (13.1%). Thirteen of the 17 strains resistant to erythromycin had the MLS phenotype (resistance to erythromycin and clindamycin) and 4 had the M phenotype (resistance to erythromycin only). Within the MLS phenotype, resistance was constitutive in 9 strains, and induced in 4 strains (positive D test). Compared with 2002 there was a significant increase in resistance to clindamycin (from 3.27% to 13.1% $p < 0.002$) and erythromycin (1.09% to 17% $p < 0.001$). 100% GSB remained sensitive to penicillin and ampicillin. Conclusions: GBS remains highly susceptible to drugs of choice for prevention of perinatal sepsis. There is a significant increase in antimicrobial resistance to clindamycin and

erythromycin. Therefore, it is necessary to request susceptibility testing in GBS from third trimester of pregnancy screening in patients allergic to penicillin.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *Free Access Content* in Revista Chilena de Infectología

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Title: Antimicrobial resistance in group B streptococcus: the Australian experience.

Citation: Journal of medical microbiology, Feb 2011, vol. 60, p. 230-235, 1473-5644 (February 2011)

Author(s): Garland, Suzanne M, Cottrill, Erin, Markowski, Lisa, Pearce, Chris, Clifford, Vanessa, Ndisang, Daniel, Kelly, Nigel, Daley, Andrew J, Australasian Group for Antimicrobial Resistance-GBS Resistance Study Group

Abstract: Intrapartum chemoprophylaxis for pregnant group B streptococcus (GBS) carriers reduces vertical transmission, with a resultant decrease in neonatal as well as maternal morbidity from invasive GBS infection. Current Australian guidelines recommend penicillin for intrapartum prophylaxis of GBS carriers, with erythromycin or clindamycin for those with a β-lactam allergy. Recent reports globally suggest that resistance to erythromycin and clindamycin may be increasing; hence, a study was undertaken to promote an evidence base for local clinical guidelines. Samples collected for standardized susceptibility testing included 1160 invasive GBS isolates (264 isolates retrospectively from 1982 to 2001 and prospectively from 2002 to 2006, plus 896 prospectively collected colonizing GBS isolates gathered over a 12 month period from 2005 to 2006) from 16 laboratories around Australia. All isolates displaying phenotypic macrolide or lincosamide resistance were subsequently genotyped. No isolates showed reduced susceptibility to penicillin or vancomycin. Of the invasive isolates, 6.4 % demonstrated phenotypic erythromycin resistance and 4.2 % were clindamycin resistant. Of the erythromycin-resistant isolates, 53 % showed cross-resistance to clindamycin. Very similar results were found in colonizing specimens. There was no statistically significant change in macrolide-resistance rates over the two study periods 1982-2001 and 2002-2006. Genotyping for macrolide and lincosamide-resistant isolates was largely consistent with phenotype. These findings suggest that penicillin therapy remains an appropriate first-line antibiotic choice for intrapartum GBS chemoprophylaxis, with erythromycin and/or clindamycin resistance being low in the Australian population. It would, nevertheless, be appropriate for laboratories screening for GBS in obstetric patients to consider macrolide sensitivity testing, particularly for those with β-lactam allergy, to ensure appropriate chemoprophylaxis.

Source: Medline

Full Text:
Available from *Free Access Content* in Journal of Medical Microbiology

Title: Antibiotic susceptibilities and serotyping of clinical Streptococcus agalactiae isolates

Citation: Balkan Medical Journal, 2011, vol./is. 28/4(362-365), 2146-3123;2146-3131 (2011)

Author(s): Atalay A., Olcu M., Percin D.

Language: English

Abstract: Objective: Streptococcus agalactiae (Group B streptococci, GBS) are frequently responsible for sepsis and meningitis seen in the early weeks of life. GBS may cause perinatal infection and premature birth in pregnant women. The aim of this study was to serotype GBS strains isolated from clinical samples and evaluate their serotype distribution according to their susceptibilities to antibiotics and isolation sites. Material and Methods: One hundred thirty one S. agalactiae strains isolated from the clinical samples were included in the study. Of the strains, 99 were isolated from urine, 20 from soft tissue, 10 from blood and 2 from vaginal swab. Penicillin G and ceftriaxone susceptibilities of GBS were determined by the agar dilution method. Susceptibilities to erythromycin, clindamycin, vancomycin and tetracycline were determined by the Kirby-Bauer method according to CLSI criteria. Serotyping was performed using the latex aglutination method using specific antisera (Ia, Ib, II-VIII). Results: While in 131 GBS strains, serotypes VII and VIII were not detected, the most frequently isolated serotypes were types Ia (36%), III (30.5%) and II (13%) respectively. Serotype Ia was the most frequently seen serotype in all samples. All GBS isolates were susceptible to penicilin G, ceftriaxone and vancomycin. Among the strains, tetracycline, erythromycin and clindamycin resistance rates were determined as 90%, 14.5%, and 13% respectively. Conclusion: Penicillin is still the first choice of treatment for the infections with all serotypes of S. agalactiae in Turkey. © Trakya University Faculty of Medicine.

Publication Type: Journal: Article

Source: EMBASE

Title: Detection of Group B Streptococcus in Brazilian pregnant women and antimicrobial susceptibility patterns.

Citation: Brazilian journal of microbiology : [publication of the Brazilian Society for Microbiology], Oct 2010, vol. 41, no. 4, p. 1047-1055, 1517-8382 (October 2010)

Author(s): Castellano-Filho, Didier Silveira, da Silva, Vânia Lúcia, Nascimento, Thiago César, de Toledo Vieira, Marcel, Diniz, Cláudio Galuppo

Abstract: Group B Streptococcus (GBS) is still not routinely screened during pregnancy in Brazil, being prophylaxis and empirical treatment based on identification of risk groups. This study aimed to investigate GBS prevalence in Brazilian pregnant women by culture or polymerase chain reaction (PCR) associated to the enrichment culture, and to determine the

antimicrobial susceptibility patterns of isolated bacteria, so as to support public health policies and empirical prophylaxis. After an epidemiological survey, vaginal and anorectal specimens were collected from 221 consenting laboring women. Each sample was submitted to enrichment culture and sheep blood agar was used to isolate suggestive GBS. Alternatively, specific PCR was performed from enrichment cultures. Antimicrobial susceptibility patterns were determined for isolated bacteria by agar diffusion method. No risk groups were identified. Considering the culture-based methodology, GBS was detected in 9.5% of the donors. Twenty five bacterial strains were isolated and identified. Through the culture-PCR methodology, GBS was detected in 32.6% specimens. Bacterial resistance was not detected against ampicillin, cephazolin, vancomycin and ciprofloxacin, whereas 22.7% were resistant to erythromycin and 50% were resistant to clindamycin. GBS detection may be improved by the association of PCR and enrichment culture. Considering that colony selection in agar plates may be laboring and technician-dependent, it may not reflect the real prevalence of streptococci. As in Brazil prevention strategies to reduce the GBS associated diseases have not been adopted, prospective studies are needed to anchor public health policies especially considering the regional GBS antimicrobial susceptibility patterns.

Source: Medline

Full Text:
Available from *National Library of Medicine* in Brazilian Journal of Microbiology
Available from *ProQuest* in Brazilian Journal of Microbiology

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Title: Serotype distribution and antibiotic susceptibility of group B streptococci in pregnant women.

Citation: Epidemiology and infection, Jul 2010, vol. 138, no. 7, p. 979-981, 1469-4409 (July 2010)

Author(s): Dhanoa, A, Karunakaran, R, Puthucheary, S D

Abstract: Group B streptococcus (GBS) is a leading cause of neonatal sepsis and is usually acquired via the woman's birth canal. GBS serotypes isolated from 200 pregnant women were determined. Serotypes V (19%) and VI (17%) were the most frequent followed by serotypes III (12%), Ia (11.5%) and IV (10%); 17% of the strains were non-typable. All isolates were susceptible to penicillin, 96% to erythromycin and 97.5% to clindamycin. The emergence of new GBS serotypes has important implications for vaccine prevention strategies.

Source: Medline

Full Text:
Available from *ProQuest* in Epidemiology and Infection

Title: Genetic characterization and diversity of Streptococcus agalactiae isolates with macrolide resistance.

Citation: Journal of medical microbiology, Jul 2010, vol. 59, p. 780-786, 1473-5644 (July 2010)

Author(s): Brzychczy-Wloch, Monika, Gosiewski, Tomasz, Bodaszewska, Malgorzata, Pabian, Wojciech, Bulanda, Malgorzata, Kochan, Piotr, Strus, Magdalena, Heczko, Piotr B

Abstract: Macrolide resistance in 169 Streptococcus agalactiae [group B streptococcus (GBS)] isolates originating from pregnant carriers was investigated. Using multiplex PCR the presence of genes encoding erythromycin resistance and capsular polysaccharides, as well as surface proteins, was determined. Random amplification of polymorphic DNA (RAPD) and PFGE were used to characterize specific clones among the isolates. In the examined population of women, erythromycin-resistant strains were found in 4.5 % of patients, whereas clindamycin-resistant strains were found in 3 % of patients, which was 16 % of strains resistant to erythromycin and 10 % of strains resistant to clindamycin among GBS isolates, respectively. Among the isolates, the largest percentage was represented by the constitutive macrolide-lincosamide-streptogramin B (cMLS(B)) phenotype (63 %), then the inductive macrolide-lincosamide-streptogramin B (iMLS(B)) phenotype (26 %) and the macrolide resistance (M) phenotype (11 %). The ermB gene was indicated in all isolates with the cMLS(B) phenotype and V serotype, whereas mefA/mefE genes were found in isolates with the M phenotype and Ia serotype. Among resistance isolates, serotype V was predominant (67 %), followed by serotypes II (15 %), Ia (11 %) and III (7 %). The most common surface protein encoding genes were alp3 (70 %), then rib (11 %), epsilon (7.5 %), bca (7.5 %) and alp2 (4 %). A statistically significant relationship between macrolide resistance, serotype V and the alp3 gene was demonstrated. PFGE, in comparison to the RAPD method, gave better genetic discrimination of GBS isolates. A relatively high genetic diversity among investigated strains was shown. In addition, the largest genetic homogeneity was found in serotype V.

Source: Medline

Full Text:
Available from *Free Access Content* in Journal of Medical Microbiology

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Title: Changing molecular epidemiology of group B streptococcus in Korea.

Citation: Journal of Korean medical science, Jun 2010, vol. 25, no. 6, p. 817-823, 1598-6357 (June 2010)

Author(s): Seo, Yong Soo, Srinivasan, Usha, Oh, Kwan-Young, Shin, Jung-Hwan, Chae, Jeong Don, Kim, Moon Young, Yang, Jae Hyug, Yoon, Hye-Ryung, Miller, Brady, DeBusscher, Joan, Foxman, Betsy, Ki, Moran

Abstract: The prevalence of group B streptococcus (GBS) among pregnant women and disease burdens in neonates and adults are increasing in Korea. Colonizing isolates, collected by screening pregnant women (n=196), and clinical isolates collected from clinical patients throughout Korea (n=234), were serotyped and screened for antibiotic resistance.

Serotype III (29.8%) and V (27.7%) predominated, followed by Ia (17.0%). Antibiotic resistance was higher among clinical than colonizing isolates for erythromycin (35.1% and 26.9%; P=0.10) and for clindamycin (49.4% and 42.1%; P=0.17). erm(B) occurred in 91.9% of erythromycin resistant isolates, and 84.0% of isolates resistant to clindamycin. Only five isolates (4.2%) resistant to erythromycin were susceptible to clindamycin; by contrast, and unique to Korea, 34% of isolates resistant to clindamycin were erythromycin susceptible. Among these 60 erythromycin-susceptible & clindamycin-resistant isolates, 88% was serotype III, and lnu(B) was found in 89% of strains. Four fifths of the serotype V isolates were resistant to both erythromycin and clindamycin. Further characterization of the genetic assembly of these resistance conferring genes, erm(B) and lnu(B), will be useful to establish the clonal lineages of multiple resistance genes carrying strains.

Source: Medline

Full Text:
Available from *National Library of Medicine* in Journal of Korean Medical Science
Available from *National Library of Medicine* in Journal of Korean Medical Science
Available from *Free Access Content* in Journal of Korean Medical Science

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Title: Clindamycin-resistant group B Streptococcus and failure of intrapartum prophylaxis to prevent early-onset disease.

Citation: The Journal of pediatrics, Mar 2010, vol. 156, no. 3, p. 501-503, 1097-6833 (March 2010)

Author(s): Blaschke, Anne J, Pulver, Laurie S, Korgenski, E Kent, Savitz, Lucy A, Daly, Judy A, Byington, Carrie L

Abstract: Guidelines recommend intrapartum antibiotic prophylaxis (IAP) for parturient women who have a screen positive for group B Streptococcus (GBS). Clindamycin should be used for IAP only if the maternal GBS isolate is susceptible. We report a case of clindamycin-resistant GBS disease in a newborn infant whose mother received clindamycin IAP, and we review clindamycin susceptibility testing.

Source: Medline

Full Text:
Available from *Journal of Pediatrics* in Patricia Bowen Library and Knowledge Service West Middlesex university Hospital

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Title: Epidemiology of group B streptococcus in Korean pregnant women.

Citation: Epidemiology and infection, Feb 2010, vol. 138, no. 2, p. 292-298, 1469-4409 (February 2010)

Author(s): Lee, B K, Song, Y R, Kim, M Y, Yang, J H, Shin, J H, Seo, Y S, Oh, K Y, Yoon, H R, Pai, S Y, Foxman, B, Ki, M

Abstract: Between January 2006 and May 2008, 2624 pregnant S. Korean women between 35-37 weeks gestation were screened for group B streptococcus (GBS). Resistance to antimicrobials was tested by disk diffusion and serotype determined using co-agglutination assays and microarray methods. Overall, 8% of pregnant women were colonized. Serotype III was the predominant serotype (43.8%), followed by serotypes V (20.3%), Ia (12.1%), and Ib (9.5%). GBS was frequently resistant to clindamycin (54.0%) and erythromycin (25.6%); 3.7% were resistant to cefazolin. More than three-quarters of serotype V were resistant to clindamycin or erythromycin or both, and 71% of serotype III were resistant to clindamycin but only 12% were resistant to erythromycin. GBS prevalence exceeded earlier reports by one-third. This is the first report of cefazolin resistance in Korea. These results underscore the need to establish screening measures and chemoprophylaxis guidelines regarding GBS infections in Korea.

Source: Medline

Title: Prevalence and mechanisms of erythromycin resistance in Streptococcus agalactiae from healthy pregnant women.

Citation: Microbial drug resistance (Larchmont, N.Y.), Jun 2009, vol. 15, no. 2, p. 121-124, 1931-8448 (June 2009)

Author(s): Pinheiro, Sandra, Radhouani, Hajer, Coelho, Céline, Gonçalves, Alexandre, Carvalho, Eulália, Carvalho, José António, Ruiz-Larrea, Fernanda, Torres, Carmen, Igrejas, Gilberto, Poeta, Patrícia

Abstract: We sought to determine the resistance phenotypes for erythromycin and clindamycin and the mechanisms implicated in 93 Streptococcus agalactiae isolates recovered from healthy pregnant women. Susceptibility testing for erythromycin, clindamycin, penicillin, cefotaxime, vancomycin, quinupristin-dalfopristin, choramphenicol, ofloxacin, and meropenen was carried out by disc-diffusion test, and the E-test was also applied for erythromycin and clindamycin. The constitutive MLS(B) resistance (cMLS(B)) and inducible MLS(B) resistance (iMLS(B)) phenotypes, respectively, as well as the M resistance phenotype were determined by the erythromycin-clindamycin double-disc test. The presence of ermA, ermB, ermC, msrA, and mef(A/E) macrolide resistance genes was studied by PCR. Resistance to erythromycin and clindamycin was found in 15% and 9.6% of the isolates, respectively. The resistance phenotypes detected among the 14 erythromycin-resistant isolates were as follows (number of isolates): cMLS(B) (9), iMLS(B) (3), and M (2). The MICs for erythromycin and clindamycin were as follows: cMLS(B) isolates (128-256 and >or=32 mg/L, respectively), iMLS(B) isolates (16-256 and 1 mg/L), and M isolates (2-8 and 1 mg/L). The following combination of genes were detected among isolates with cMLS(B) or iMLS(B) phenotypes: erm(B) (6 isolates), ermA + ermTR (3), ermA + ermB + ermTR (1), and none of these genes (2). The two isolates with M phenotype harbored the mef(A/E), and msrA gene was also found in one of them.

Source: Medline

Full Text:
Available from *ProQuest* in Microbial Drug Resistance

Title: Maternal and neonatal colonisation of group B streptococcus at Muhimbili National Hospital in Dar es Salaam, Tanzania: prevalence, risk factors and antimicrobial resistance.

Citation: BMC public health, Jan 2009, vol. 9, p. 437., 1471-2458 (2009)

Author(s): Joachim, Agricola, Matee, Mecky I, Massawe, Furaha A, Lyamuya, Eligius F

Abstract: Group B streptococcus (GBS), which asymptomatically colonises the vaginal and rectal areas of women, is the leading cause of septicemia, meningitis and pneumonia in neonates. In Tanzania no studies have been done on GBS colonisation of pregnant women and neonates. This study was conducted in Dar es Salaam, Tanzania to determine the prevalence of GBS colonisation among pregnant women, the neonatal colonisation rate and the antimicrobial susceptibility, thus providing essential information to formulate a policy for treatment and prevention regarding perinatal GBS diseases. This cross sectional study involved 300 pregnant women attending antenatal clinic and their newborns delivered at Muhimbili National Hospital (MNH) between October 2008 and March 2009. High vaginal, rectal, nasal, ear and umbilical swabs were cultured on Todd Hewitt Broth and in 5% sheep blood agar followed by identification of isolates using conventional methods and testing for their susceptibility to antimicrobial agents using the Kirby-Bauer method. GBS colonisation was confirmed in 23% of pregnant women and 8.9% of neonates. A higher proportion of GBS were isolated from the vagina (12.3%) as compared to the rectum (5%). Prolonged duration of labour (>12 hrs) was significantly shown to influence GBS colonisation in neonates $P < 0.05$. Other risk factors such as prolonged rupture of membrane, intrapartum fever, low birth weight and HIV infection did not correlate with GBS colonisation. All isolates were sensitive to vancomycin and ampicillin. Resistance to clindamycin, erythromycin and penicillin G was found to 17.6%, 13% and 9.4%, respectively. Our findings seem to suggest that a quarter of pregnant women attending ANC clinic at MNH and approximately 10% of their newborns are colonised with GBS. All isolates were found to be sensitive to vancomycin and ampicillin which seem to be the most effective antibiotics for the time being. However there is a need for continuous antibiotics surveillance of GBS to monitor trend of resistance. The high isolation frequency of GBS among pregnant women suggests routine antenatal screening at 35 to 37 weeks of gestation in order to provide antibiotic prophylaxis to GBS carrier.

Source: Medline

Full Text:
Available from *National Library of Medicine* in BMC Public Health
Available from *ProQuest* in BMC Public Health
Available from *National Library of Medicine* in BMC Public Health
Available from *BioMed Central* in BMC Public Health

Title: Vaginal carriage and antibiotic susceptibility profile of group B Streptococcus during late pregnancy in Ismailia, Egypt.

Citation: Journal of infection and public health, Jan 2009, vol. 2, no. 2, p. 86-90, 1876-035X (2009)

Author(s): Shabayek, Sarah Ahmed Abd El-Kawy, Abdalla, Salah Mohamed, Abouzeid, Abouzeid M H

Abstract: Group B Streptococcus (GBS) infection has long been recognized as a frequent cause of morbidity and mortality in newborn infants. The purpose of this study was to determine the colonization rate with GBS and the antibiotic susceptibility profile in pregnant women attending Gynecological clinics in Egypt. One-hundred and fifty vaginal swabs were collected from pregnant women at 35-40 weeks of gestation. In comparison to culture, direct latex agglutination testing revealed 100% sensitivity and 93.75% specificity. Thirty-eight specimens (25.3%) were found to be positive for GBS. Each isolate was tested for susceptibility to penicillin G, ampicillin, cefotaxime, erythromycin, clindamycin and vancomycin. Erythromycin-resistant isolates were further classified by double-disk method. All isolates were susceptible to penicillin G, ampicillin and vancomycin. Resistance to cefotaxime was detected in three isolates (7.89%). Five isolates (13.15%) were resistant to erythromycin and nine isolates (23.68%) were resistant to clindamycin. Four (80%) isolates had constitutive macrolide-lincosamide-Streptogramin(B) resistance (cMLSB(B)) resistance and one (20%) isolate had inducible resistance (iMLS(B)) resistance. GBS colonization was found to be high in our region. Latex agglutination testing and Islam medium are reliable methods to detect GBS in late pregnancy; however, latex agglutination test is rapid and simpler. Penicillin G remains the first choice antibiotic for treatment of GBS infections.

Source: Medline

Title: Vaginal colonization of Group B streptococci during late pregnancy in Southeast of Iran: Incidence, serotype distribution and susceptibility to antibiotics

Citation: Journal of Medical Sciences, September 2008, vol./is. 8/6(574-578), 1682-4474;1812-5727 (15 Sep 2008)

Author(s): Mansouri S., Ghasami E., Najad N.S.

Language: English

Abstract: The objective of present study was to determine reliable data on vaginal carriage, serotype distribution and antibacterial susceptibility of Streptococcus agalactiae, Group B streptococcus (GBS) in pregnant women in southeast of Iran. Vaginal swab cultures for GBS were obtained from 602 pregnant women at childbirth. Susceptibility of the isolates to penicillin, ampicillin, clindamycin and erythromycin were determined by standard agar dilution method. Isolates were classified according to their capsular polysaccharide types.

GBS was isolated from 55 pregnant women (9.1%). All isolates were sensitive to penicillin and ampicillin [Minimum Inhibitory concentration (MIC) range of 0.03-16 mug mL⁻¹ and <0.03-1 mug mL⁻¹, respectively). Erythromycin and clindamycin resistance were seen in 10.9% (MIC range <0.03-16 mug mL⁻¹) and 25.4% (MIC range <0.03-32 mug mL⁻¹) of the isolates, respectively. Serotype III (41.8%), Ib (25.45%) and II were the most frequently isolated serotypes (14.54%). Group IV was not detected and 14.54% of the isolates were non type-able. No correlation was found between GBS colonization and demographic factors of age, parity, history of abortion or ruptured membrane and vaginal signs or symptoms. In conclusion the rate of GBS colonization is low in this area, but serotype III, which is mostly involved in invasive disease is the predominant serotype. Routine maternal screening should be performed to prevent group B streptococcal disease in neonates in this district. Susceptibility to the isolates to clindamycin and erythromycin should be checked in the penicillin-allergic patients, to avoid treatment failure.

Publication Type: Journal: Article

Source: EMBASE

Full Text:
Available from *Free Access Content* in Journal of Medical Sciences

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Title: Epidemiology of invasive group B streptococcal disease in the United States, 1999-2005.

Citation: JAMA, May 2008, vol. 299, no. 17, p. 2056-2065, 1538-3598 (May 7, 2008)

Author(s): Phares, Christina R, Lynfield, Ruth, Farley, Monica M, Mohle-Boetani, Janet, Harrison, Lee H, Petit, Susan, Craig, Allen S, Schaffner, William, Zansky, Shelley M, Gershman, Ken, Stefonek, Karen R, Albanese, Bernadette A, Zell, Elizabeth R, Schuchat, Anne, Schrag, Stephanie J, Active Bacterial Core surveillance/Emerging Infections Program Network

Abstract: Group B streptococcus is a leading infectious cause of morbidity in newborns and causes substantial disease in elderly individuals. Guidelines for prevention of perinatal disease through intrapartum chemoprophylaxis were revised in 2002. Candidate vaccines are under development. To describe disease trends among populations that might benefit from vaccination and among newborns during a period of evolving prevention strategies. Analysis of active, population-based surveillance in 10 states participating in the Active Bacterial Core surveillance/Emerging Infections Program Network. Age- and race-specific incidence of invasive group B streptococcal disease. There were 14,573 cases of invasive group B streptococcal disease during 1999-2005, including 1348 deaths. The incidence of invasive group B streptococcal disease among infants from birth through 6 days decreased from 0.47 per 1000 live births in 1999-2001 to 0.34 per 1000 live births in 2003-2005 (P < .001), a relative reduction of 27% (95% confidence interval [CI], 16%-37%). Incidence remained stable among infants aged 7 through 89 days (mean, 0.34 per 1000 live births) and pregnant women (mean, 0.12 per 1000 live births). Among persons aged 15 through 64

years, disease incidence increased from 3.4 per 100,000 population in 1999 to 5.0 per 100,000 in 2005 (chi2(1) for trend, 57; P < .001), a relative increase of 48% (95% CI, 32%-65%). Among adults 65 years or older, incidence increased from 21.5 per 100,000 to 26.0 per 100,000 (chi2(1) for trend, 15; P < .001), a relative increase of 20% (95% CI, 8%-35%). All 4882 isolates tested were susceptible to penicillin, ampicillin, and vancomycin, but 32% and 15% were resistant to erythromycin and clindamycin, respectively. Serotypes Ia, Ib, II, III, and V accounted for 96% of neonatal cases and 88% of adult cases. Among infants from birth through 6 days, the incidence of group B streptococcal disease was lower in 2003-2005 relative to 1999-2001. This reduction coincided with the release of revised disease prevention guidelines in 2002. However, the disease burden in adults is substantial and increased significantly during the study period.

Source: Medline

Full Text:
Available from *Journal of the American Medical Association (JAMA)* in Patricia Bowen Library and Knowledge Service West Middlesex university Hospital
Available from *Silverchair Information Systems* in JAMA: Journal of the American Medical Association

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Title: Antibiotic susceptibility patterns and prevalence of group B Streptococcus isolated from pregnant women in Misiones, Argentina.

Citation: Brazilian journal of microbiology : [publication of the Brazilian Society for Microbiology], Apr 2008, vol. 39, no. 2, p. 245-250, 1517-8382 (April 2008)

Author(s): Quiroga, M, Pegels, E, Oviedo, P, Pereyra, E, Vergara, M

Abstract: This study was performed to determine the susceptibility patterns and the colonization rate of Group B Streptococcus (GBS) in a population of pregnant women. From January 2004 to December 2006, vaginal-rectal swabs were obtained from 1105 women attending Dr. Ramón Madariaga Hospital, in Posadas, Misiones, Argentina. The carriage rate of GBS among pregnant women was 7.6%. A total of 62 GBS strains were randomly selected for in vitro susceptibility testing to penicillin G, ampicillin, tetracycline, levofloxacin, gatifloxacin, ciprofloxacin, quinupristin-dalfopristin, linezolid, vancomycin, rifampicin, trimethoprim- sulfametoxazol, nitrofurantoin, gentamicin, clindamycin and erythromycin, and determination of resistance phenotypes. No resistance to penicillin, ampicillin, quinupristin-dalfopristin, linezolid, and vancomycin was found. Of the isolates examined 96.8%, 98.3%, 46.8%, and 29.0% were susceptible to rifampicin, nitrofurantoin, trimethoprim-sulfametoxazol and tetracycline, respectively. Rank order of susceptibility for the quinolones was: gatifloxacin (98.4%) > levofloxacin (93.5%) > ciprofloxacin (64.5%). The rate of resistance to erythromycin (9.7%) was higher than that of other reports from Argentina. High-level resistance to gentamicin was not detected in any of the isolates. Based on our finding of 50% of GBS isolates with MIC to gentamicin equal o lower than 8 µg/ml, a concentration used in one of the selective media recommended for GBS isolation, we suggested, at least in our population, the use of nalidixic acid and colistin in selective media with the aim to improve the sensitivity of screening cultures for GBS carriage in women.

Source: Medline

Full Text:
Available from *National Library of Medicine* in Brazilian Journal of Microbiology
Available from *ProQuest* in Brazilian Journal of Microbiology

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Title: Prevalence of maternal group B streptococcal colonisation in European countries.

Citation: Acta obstetricia et gynecologica Scandinavica, Jan 2008, vol. 87, no. 3, p. 260-271, 1600-0412 (2008)

Author(s): Barcaite, Egle, Bartusevicius, Arnoldas, Tameliene, Rasa, Kliucinskas, Mindaugas, Maleckiene, Laima, Nadisauskiene, Ruta

Abstract: Group B streptococcus (GBS) is a leading cause of neonatal sepsis in many industrialised countries. However, the burden of perinatal GBS disease varies between these countries. We undertook a systematic review to determine the prevalence of maternal group B streptococcal colonisation, one of the most important risk factor for early onset neonatal infection, and to examine the serotype distribution of the GBS strains isolated and their susceptibility to antibiotics in European countries. We followed the standard methodology for systematic reviews. We prepared a protocol and a form for data extraction that identifies key characteristics on study and reporting quality. The search was conducted for the years 1996-2006 including electronic, hand searching and screening of reference lists. Twenty-one studies presented data on 24,093 women from 13 countries. Among all studies, GBS vaginal colonisation rates ranged from 6.5 to 36%, with one-third of studies reporting rates of 20% or greater. The regional carriage rates were as follows: Eastern Europe 19.7-29.3%, Western Europe 11-21%, Scandinavia 24.3-36%, and Southern Europe 6.5-32%. GBS serotypes III, II and Ia were the most frequently identified serotypes. None of the GBS isolates were resistant to penicillin or ampicillin, whereas 3.8-21.2% showed resistance to erythromycin and 2.7-20% showed resistance to clindamycin. Although there is variation in the proportion of women colonised with GBS, the range of colonisation, the serotype distribution and antimicrobial susceptibility reported from European countries appears to be similar to that identified in overseas countries.

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Title: Prenatal culture-based screening of Streptococcus agalactiae colonisation: resistance against erythromycin and clindamycin.

Citation: European journal of clinical microbiology & infectious diseases : official publication of the European Society of Clinical Microbiology, Aug 2006, vol. 25, no. 8, p. 532-534, 0934-9723 (August 2006)

Author(s): Lavergne, V, Laverdière, M, Duchesne, A, Béliveau, C, Delorme, J, Di Zazzo, A, Labbé, A C

Source: Medline

Full Text:
Available from *ProQuest* in European Journal of Clinical Microbiology and Infectious Diseases
Available from *Springer Link Journals* in European Journal of Clinical Microbiology and Infectious Diseases

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Title: Patterns of antibiotic resistance among group B Streptococcus isolates: 2001-2004

Citation: Infectious Diseases in Obstetrics and Gynecology, 2006, vol./is. 2006/(no pagination), 1064-7449;1098-0997 (2006)

Author(s): Chohan L., Hollier L.M., Bishop K., Kilpatrick C.C.

Language: English

Abstract: The objectives were to determine the prevalence of group B streptococcus (GBS) and to characterize antibiotic resistance patterns. All pregnant women presenting to the triage units at two urban hospitals during three intervals from 2001 to 2004 were included. Each interval lasted approximately four weeks. Swabs were inoculated into selective broth and cultured on tryptic soy agar with 5% sheep blood. GBS was identified using the StrepTex latex agglutination system. GBS positive cultures were tested for their resistance to ampicillin, erythromycin, clindamycin, and cefazolin. GBS was isolated from 154 (12.2%) of 1264 swabs collected during the study period. African-American women were more likely to be colonized with GBS than Caucasians and Hispanics. Resistance to routinely administered antibiotics was common, but there were no statistically significant increases in resistance to antibiotics over the study period. Ongoing surveillance of antibiotic resistance patterns is important in determining optimal prophylaxis and therapy. Copyright © 2006 Lubna Chohan et al.

Publication Type: Journal: Article

Source: EMBASE

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Available from *National Library of Medicine* in Infectious Diseases in Obstetrics and Gynecology
Available from *Hindawi Publishing Corporation* in Infectious Diseases in Obstetrics and Gynecology

Title: Antimicrobial susceptibility of group B streptococci collected in two Belgian hospitals.

Citation: Acta clinica Belgica, Sep 2005, vol. 60, no. 4, p. 180-184, 1784-3286 (2005 Sep-Oct)

Author(s): Decoster, L, Frans, J, Blanckaert, H, Lagrou, K, Verhaegen, J

Abstract: to determine the in vitro susceptibility of group B streptococci (GBS) to antibiotics, used for intrapartum chemoprophylaxis and treatment of infections; to determine the rate of resistance to erythromycin and clindamycin and the phenotype distribution of GBS strains. 262 GBS strains from pregnant women at 35-37 weeks' gestation were collected in University Hospital Gasthuisberg (Leuven) and Imelda Hospital (Bonheiden). The minimum inhibitory concentrations (MICs) of penicillin G, amoxicillin, cefazolin, cefotaxime, erythromycin, clindamycin, gentamicin, vancomycin and linezolid were determined by the agar dilution method, according to NCCLS guidelines. all isolates were susceptible to penicillin, amoxicillin, cefazolin, cefotaxime, vancomycin and linezolid. We found resistance rates of 16.7% to erythromycin and 11.0% to clindamycin. Of all erythromycin-resistant strains, 63.6% had the cMLSB phenotype, 20.5% the iMLSB phenotype and 15.9% the M-phenotype. For 25% of erythromycin-resistant strains, the resistance was of a very high level (MICs ranging from 128 microg/mL to 256 microg/mL). All these isolates belong to the cMLSB phenotype. For the remaining 75% the resistance to erythromycin was of low level (MICs ranging from 1 microg/mL to 4 microg/mL). These isolates had the cMLSB phenotype (38.6%), the iMLSB phenotype (20.5%) and the M-phenotype (15.9%). the susceptibility of GBS to the beta-lactam antibiotics supports the continued use of penicillin for intrapartum chemoprophylaxis. For women who are allergic to penicillin, clindamycin or erythromycin are considered to be the alternatives, however resistance rates to these antibiotics are significant.

Source: Medline

Title: Prevalence of erythromycin and clindamycin resistance among Streptococcus agalactiae isolates in Germany.

Citation: Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases, Jul 2005, vol. 11, no. 7, p. 579-582, 1198-743X (July 2005)

Author(s): Schoening, T E, Wagner, J, Arvand, M

Abstract: The antimicrobial susceptibilities of 338 clinical Streptococcus agalactiae isolates from two geographical regions in Germany were determined by agar dilution. All isolates were susceptible to penicillin, cefotaxime and vancomycin. The overall frequencies of erythromycin and clindamycin resistance were 11% and 4.7%, respectively. Determination of resistance phenotypes among the 37 erythromycin-resistant isolates revealed constitutive and inducible MLS(B) resistance in 40.6% and 37.8% of isolates, respectively, and susceptibility to clindamycin in 21.6% of isolates. Only 14.3% of isolates with inducible

MLS(B) resistance were identified as clindamycin-resistant by determination of clindamycin MICs. Pulsed-field gel electrophoresis suggested a clonal distribution pattern among the erythromycin-resistant isolates.

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Title: Maternal carriage and neonatal colonisation of group B streptococcus in eastern Turkey: prevalence, risk factors and antimicrobial resistance.

Citation: International journal of clinical practice, Apr 2005, vol. 59, no. 4, p. 437-440, 1368-5031 (April 2005)

Author(s): Kadanali, A, Altoparlak, U, Kadanali, S

Abstract: Our object is to determine the prevalence of group B streptococcus (GBS) carriage among pregnant women, the neonatal colonisation rate and the antimicrobial susceptibility to formulate a policy for treatment and prevention regarding perinatal GBS diseases in eastern Turkey. A total of 150 pregnant women were screened for GBS colonisation. Samples were collected from the vagina and the rectum of pregnant women, and the ear canal, throat and umbilicus of the neonates of colonised mothers. Antimicrobial susceptibility of the isolates was also investigated. GBS was isolated in at least one specimen from the 150 women in 48 cases; it was estimated that, overall, about 32% of the pregnant women and 17.3% of overall newborns were colonised with GBS. The overall rate of GBS vertical transmission was 54.2% in this study. Maternal colonisation rate was significantly higher in younger ages ($p < 0.01$) when maternal age of 20 years was taken as a cut-off point. All isolates were found to be sensitive to penicillin, ampicillin, cefazolin and vancomycin. Resistance to erythromycin and clindamycin were found to be 13.5 and 2.7%, respectively.

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Title: Antibiotic resistance patterns of group B streptococcal clinical isolates.

Citation: Infectious diseases in obstetrics and gynecology, Jan 2004, vol. 12, no. 1, p. 1-8, 1064-7449 (2004)

Author(s): Simoes, Jose A, Aroutcheva, Alla A, Heimler, Ira, Faro, Sebastian

Abstract: To determine the in vitro resistance of group B streptococcus (GBS) to 12 antibiotics. To determine if there has been any decrease in sensitivity to the penicillins or other antibiotics currently used for GBS chemoprophylaxis in pregnant women. Find suitable alternative antibiotics to penicillin. Find an antibiotic that will have minimal selective pressure for resistance among the endogenous resident vaginal microflora. The antibiotic susceptibility profiles of 52 clinical isolates of GBS were evaluated to 12 antibiotics: ampicillin, azithromycin, cefamandole, cefazolin, ceftriaxone, ciprofloxacin, clindamycin, erythromycin, nitrofurantoin, ofloxacin, penicillin and vancomycin. Antibiotic sensitivities were determined using disk diffusion and microdilution methods according to the guidelines of the National Committee for Clinical Laboratory Standards (NCCLS). All isolates were sensitive to vancomycin, ofloxacin, ampicillin, ciprofloxacin, nitrofurantoin and penicillin. However, the following number of clinical isolates exhibited intermediate or decreased sensitivity, nine (17%) to ampicillin, eight (15%) to penicillin, 14 (32%) to ciprofloxacin and one (2%) to nitrofurantoin. Thirty-one percent of the isolates were resistant to azithromycin and ceftriaxone, 19% to clindamycin, 15% to cefazolin and 13% to cefamandole. Eighteen (35%) of the clinical isolates tested were resistant to 6 of the 12 antibiotics tested. The relatively high rates of resistance for 6 of the 12 antibiotics tested suggest that for women allergic to penicillin and colonized with GBS, antibiotic sensitivities to their isolates should be determined. The antibiotic selected for intrapartum chemoprophylaxis should be guided by the organism's antibiotic sensitivity pattern. Patients with GBS bacteriuria should be treated with nitrofurantoin.

Source: Medline

Title: Group B Streptococcal antibiotic resistance patterns in pregnant women

Citation: Connecticut Medicine, June 2003, vol./is. 67/6(323-326), 0010-6178 (June/July 2003)

Author(s): Stiller R.J., Padilla L., Choudhary R., Tinghitella T., Laifer S.

Language: English

Abstract: Group B Streptococcal (GBS) antibiotic susceptibility studies were performed in 95 pregnant women in Bridgeport, Connecticut. Testing for penicillin, ampicillin, cefazolin, and clindamycin sensitivity was performed. Resistance to clindamycin was seen in 5 % of isolates. All isolates were susceptible to penicillin, ampicillin, and cefazolin. Clindamycin

sensitivity testing should be performed in patients who are allergic to penicillin. GBS remained uniformly susceptible to penicillin and first generation cephalosporins during this study period.

Publication Type: Journal: Article

Source: EMBASE

Title: Correlates of antibiotic-resistant group B streptococcus isolated from pregnant women

Citation: Obstetrics and Gynecology, January 2003, vol./is. 101/1(74-79), 0029-7844 (01 Jan 2003)

Author(s): Manning S.D., Foxman B., Pierson C.L., Tallman P., Baker C.J., Pearlman M.D.

Language: English

Abstract: OBJECTIVE: Despite antibiotic prophylaxis for at-risk mothers during labor and delivery, group B streptococcus still causes substantial morbidity and mortality among newborns. Resistance to antibiotics recommended for penicillin-allergic pregnant women, such as erythromycin and clindamycin, has increased. A better understanding of factors associated with group B streptococcus resistance is essential to effectively prevent group B streptococcus disease. METHODS: A total of 117 sequential group B streptococcus isolates were obtained between August 1999 and March 2000 from pregnant women at the University of Michigan Medical Center. Serotype and susceptibility to ten antimicrobials using disk diffusion with E-test for confirmation were determined, and the association between several host factors and colonization with a resistant strain was evaluated. RESULTS: Group B streptococcus was frequently resistant to erythromycin (29%) and clindamycin (21%) but was susceptible to all other antimicrobials tested. A stepwise logistic regression model revealed that black ethnicity (P = .02) and carriage of a serotype V strain (P = .01) were associated with group B streptococcus resistance. CONCLUSION: Among this population of pregnant women, black ethnicity and serotype V were the strongest predictors of colonization with an erythromycin- or clindamycin-resistant group B streptococcus strain. A better understanding of factors associated with antibiotic resistance is needed to minimize group B streptococcus disease risks and to maximize effective chemoprophylaxis. © 2003 by The American College of Obstetricians and Gynecologists.

Publication Type: Journal: Article

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Title: Prevalence and mechanisms of macrolide resistance in invasive and noninvasive group B streptococcus isolates from Ontario, Canada.

Citation: Antimicrobial agents and chemotherapy, Dec 2001, vol. 45, no. 12, p. 3504-3508, 0066-4804 (December 2001)

Author(s): de Azavedo, J C, McGavin, M, Duncan, C, Low, D E, McGeer, A

Abstract: Macrolide resistance has been demonstrated in group B streptococcus (GBS), but there is limited information regarding mechanisms of resistance and their prevalence. We determined these in GBS obtained from neonatal blood cultures and vaginal swabs from pregnant women. Of 178 isolates from cases of neonatal GBS sepsis collected from 1995 to 1998, 8 and 4.5% were resistant to erythromycin and clindamycin, respectively, and one isolate showed intermediate penicillin resistance (MIC, 0.25 microg/ml). Of 101 consecutive vaginal or rectal/vaginal isolates collected in 1999, 18 and 8% were resistant to erythromycin and clindamycin, respectively. Tetracycline resistance was high (>80%) among both groups of isolates. Of 32 erythromycin-resistant isolates, 28 possessed the erm methylase gene (7 ermB and 21 ermTR/ermA) and 4 harbored the mefA gene; one isolate harbored both genes. One isolate which was susceptible to erythromycin but resistant to clindamycin (MIC, 4 microg/ml) was found to have the linB gene, previously identified only in Enterococcus faecium. The mreA gene was found in all the erythromycin-resistant strains as well as in 10 erythromycin-susceptible strains. The rate of erythromycin resistance increased from 5% in 1995-96 to 13% in 1998-99, which coincided with an increase in macrolide usage during that time.

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