

ANTIBIOTIC SUSCEPTIBILITY PATTERN OF GROUP B STREPTOCOCCI ISOLATED FROM PREGNANT WOMEN

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ABSTRACT

Background: Antibiotic Resistance for Group B streptococci is a threat to health of newborn. **Objective:** To find out the antibiotic susceptibility pattern of the Group B Streptococci (GBS) isolated from pregnant women. **Methodology:** Fifty four isolates of Group B Streptococci were included in this study. All the strains were isolated from pregnant women who were observed to have colonized by Group B streptococci during the screening of a total 250 pregnant women. Antibiotic susceptibility testing was done using Kirby-bar disc diffusion test using five common antibiotics that are routinely used against gram positive cocci i.e. penicillin, tetracycline, vancomycin, erythromycin and clindamycin. Study was conducted from 1st January 31st to March 2014. SPSS version 16 was used for data analysis. **Results:** None of the fifty four isolates was found resistant to penicillin and vancomycin, while one isolate indicated resistance to erythromycin and three isolates were resistant to clindamycin. **Conclusion:** Consistent surveillance is required for antibiotics sensitivities of GBS and other bacteria implicated in newborn sepsis and maternal infections.

Key Words: Group B Streptococci, Pregnancy, Resistance, Susceptibility.

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INTRODUCTION

Group B Streptococcus (GBS) is the leading bacterial pathogen causing neonatal infection. It is associated with bacteraemia and meningitis among infants during first 2 months of their lives.¹ Infants with GBS disease may require prolonged hospitalization and expensive supportive therapy and the survivors may develop permanent developmental disability such as sensory neural hearing loss, cortical blindness, seizures, visual loss, speech problems and mental retardation.² It is also involved in causing chorioamnionitis and several infections observed to increase the risk of preterm rupture of membranes.^{3,4} The infectious period is unknown but can last throughout the duration of colonization or disease. Colonization in infants can persist for many months after birth and even after systemic infection treatment. 1% to 3% of properly treated infants can develop recurrent GBS disease.⁵

Penicillin or ampicillin is universal drug of choice for GBS however resistance has been reported in some recent studies⁶. Penicillin can be used in combination with aminoglycoside but it has not shown any benefit than penicillin alone. GBS isolates can be resistant to one aminoglycoside and susceptible to other one. Skin testing and desensitization for penicillin therapy must be considered. Vancomycin is a preferred treatment

for those allergic to penicillin especially in case of meningitis. Clindamycin and erythromycin had been used for group B streptococci but resistance has emerged significantly.^{6,7}

In case the isolate is susceptible, clindamycin is the best drug therapy for soft-tissue, bone and lung infections. Penicillin, ampicillin, and vancomycin are effective first-choice treatments for patients having GBS endocarditis. Vancomycin can be used for patients with GBS meningitis particularly for penicillin-allergic patients.⁶ The dramatic decrease of GBS burden in the United States is due the administration of prophylactic antibiotics, pregnant women and infants who are at risk. We assumed that if Centre for Disease control (CDC) proposed protocol could be employed effectively; there could be a drastic reduction in its incidence. The neonates in our population are deemed at higher risk for GBS infections. It must be known that the broad range of GBS disease in neonates is a continuum which includes early and late onset diseases, preterm deliveries and abortions. This study was planned to determine the antibiotic susceptibility pattern of the group B streptococci isolates from vaginal swabs.

METHODOLOGY

This was a cross sectional study. Fifty four isolates of Group B Streptococci from vaginal swabs of pregnant women were included in this study. All the

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strains were isolated from pregnant women who were observed to have colonized by Group B streptococci during the screening of a total 250 pregnant women. Antibiotic susceptibility testing was done using Kirby-bar disc diffusion test by five common antibiotics that are routinely used against gram positive cocci i.e. penicillin, tetracycline, vancomycin, erythromycin and clindamycin. Study was conducted from 1st January to 31st March 2014.

Antimicrobial Susceptibility Profile:

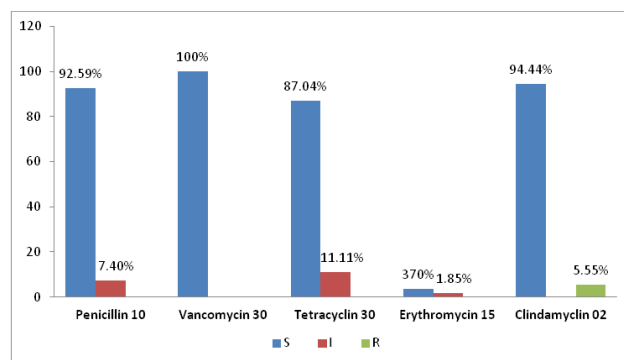
Antimicrobial susceptibility testing was done by using Kirby bar disc diffusion method using vancomycin 30µg, penicillin 10 µg, tetracycline 30 µg, erythromycin 15 µg and clindamycin 02µg discs.

Zones of inhibition were calculated using CLSI 2014 criteria. SPSS version 16 was used for data analysis.

RESULTS

Hundred percent (54/54) isolates were susceptible to vancomycin while 94.44% (51/54) were susceptible to erythromycin, 3.70% (2/54) were intermediately sensitive and 1.85% (1/54) were resistant. Clindamycin showed susceptibility for 94.44% (51/54) of isolates whereas 5.55% (3/54) were resistant. Moreover, 92.59% (50/54) isolates were found susceptible to penicillin and 7.40% (4/54) showed intermediate sensitivity. Only 87.04% (47/54) showed susceptibility to tetracycline, while 11.11% (6/54) showed intermediate susceptibility. (Figure I)

Figure I: Antibiotic susceptibility pattern result indicating various levels of susceptibility and resistance of Group B Streptococcus isolates.



S= sensitive I= intermediate R=resistant

DISCUSSION

This study indicated the antibiotic susceptibility profile of five antibiotic against of 54 GBS isolates from pregnant women. It was found that most of the strains were highly susceptible to penicillin (92.59%) and vancomycin (100%). Resistance was observed for erythromycin (1.85%) and clindamycin (5.55%). Intermediate sensitivity was observed of erythromycin (3.70%), penicillin (7.40%) and tetracycline (11.11%). Our susceptibility profile is more or less similar to study in carried out in Ethiopia in which all strains were sensitive to penicillin, vancomycin and ampicillin while resistance was observed to tetracycline (44.8%) and erythromycin (6.9%). Another study conducted in Tanzania determined that all GBS strains were sensitive to vancomycin and 90 to 98% were sensitive to penicillin while 10-20% was resistant to erythromycin.⁸ Our findings are different from a study carried out in USA that study reported much higher resistance to erythromycin (29%) while no resistance was found to penicillin and vancomycin which is in agreement with our results.⁹

In Thammusat Hospital, GBS samples were tested for drug susceptibility. All isolates were found to be susceptible to ampicillin (100%), penicillin (100%), vancomycin (100%), followed by erythromycin (98.5%) and clindamycin (96.9%). These are very similar to our sensitivity results.¹⁰ The dramatic decrease of GBS burden in the US has been attained by the administration of prophylactic antibiotics to that group of ladies and infants who are at risk. It must be known that the broad range of GBS disease in neonates is a continuum which includes early and late onset diseases, preterm deliveries and abortions. Efforts should be made to prevent GBS infection in newborns. This can be done by identification and proper and timely treatment of GBS carrier women to avoid the neonatal mortality. As documented in several studies as well as in the present study, GBS is universally sensitive to the penicillins; therefore, it should be the primary antibiotic for intrapartum prophylaxis. If the woman is allergic to penicillins, other antibiotics should be considered based on culture and sensitivity results.

CONCLUSION

All of the isolates of Group B streptococci were sensitive to vancomycin and penicillin. Consistent surveillance is required for antibiotics sensitivities of GBS and other bacteria implicated in newborn sepsis and maternal infections

Conflict of interest

The authors have declared no conflict of interest.

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