

Incidence of Group B Streptococci Colonization during the Third Trimester of Pregnancy in two Tertiary Care Centers in the Central Part of Kerala

Kundoly V Suseela¹, Vasanthy Jayaraj⁴, Thomas Betsy³, Fareena Jabeen⁴, Mohan Ramya²

ABSTRACT

Introduction: Group B streptococci (GBS) is an important cause of invasive neonatal diseases. Asymptomatic colonization of vagina with GBS may lead to vertical transmission and there by neonatal GBS diseases. Maternal GBS colonization varies with population characteristics and geographic location. This study was conducted to detect the GBS colonization in antenatal women in the central part of Kerala.

Materials and Methods: Vaginal and rectal swabs were collected from antenatal women of 35-37 weeks of gestation. Swabs from vagina were processed by direct plating onto 5% sheep blood agar and inoculation to Todd Hewitt broth followed by sub culture. Rectal swabs were processed by inoculation to Todd Hewitt broth and sub culturing. Identification was done by biochemical tests and confirmed by grouping sera.

Result: Total 442 samples were collected as vaginal and rectal swabs from 221 antenatal women. 24 women (10.8%) were found to be colonized by GBS. Of these, 23 were positive from vaginal swabs. 12 isolates obtained from both vaginal and rectal samples. 1 was positive in the rectal sample alone. 12.6 and 8.8% were positive in primi and multigravida, respectively.

Conclusion: The incidence of GBS colonized was 10.8% and hence the infants were at great risk of early-onset invasive disease. The observation of this study recommends a multi-center screening for the prevention of early onset GBS disease in order to reduce the neonatal infection rate significantly by intrapartum antibiotic prophylaxis.

Keywords: Group B streptococci, early neonatal infection, sheep blood agar, Todd Hewitt broth, vaginal and rectal colonization

significantly by IAP.¹ A continued efforts are inevitable to sustain the prevention of GBS infection and to monitor for potential adverse consequences of intrapartum antibiotic prophylaxis such as emergence of bacterial antimicrobial resistance or increased incidence.

Maternal GBS colonization varies with population characteristics and geographic location. However, demographical features such as age, parity, gestational period of women were not found to have any significant influence on the GBS.¹¹ Since the GBS colonized mothers can vertically transmit the homologous serotypes of the organism to their newborns, population based study regarding its prevalence is beneficial to reduce the morbidity and mortality. It has been reported that intrapartum prophylaxis does not prevent late-onset group B streptococcal disease. Furthermore, both the prenatal and postnatal chemoprophylaxis has not been shown to be effective.¹² The report from our society is scant. Therefore, the present study was aimed to detect the incidence of maternal carrier state of GBS in two tertiary care centers.

MATERIALS AND METHODS

The study was carried out in two tertiary care centers in central part of Kerala. Women of 35-37 weeks of gestation, both primi and multigravida, visited the department of Obstetrics and Gynecology during the period between Jun 2013 to Jun 2015 were included in the study. Consent was obtained from the subjects and the study was approved by the Institutional ethics committee for research. Women on any antibiotics for some other ailments and women with previous history of GBS disease in their neonates were excluded from the study. Vaginal and rectal swabs were collected. Vaginal swabs were directly plated on to 5% sheep blood agar and then inoculated to Todd Hewitt broth with antibiotics like colistin and nalidixic acid. Rectal swabs were inoculated to Todd Hewitt

INTRODUCTION

Lancefield Group B Streptococcus (GBS) or *Streptococcus agalactiae* is a Gram positive β hemolytic Streptococcus. The causative role of GBS in early neonatal morbidity and mortality is well established worldwide.¹ 5 to 40% of pregnant and nonpregnant women carry GBS in their genital or lower gastrointestinal tract.^{2,3} The source of the early neonatal GBS infections is the maternal genital tract from where the vertical transmission occurs.^{4,5} The intrapartum antibiotic prophylaxis (IAP) became prevalent in 1990 s to prevent the GBS neonatal sepsis.⁶ Centre for Disease Control (CDC) has recommended the universal screening for the prevention of early onset GBS disease and in some countries like the United States neonatal GBS infection rate was reduced

¹Professor, ²Tutor, Department of Microbiology, ³Professor, Department of Obstetrics and Gynecology, Amala Institute of Medical Sciences, Amala Nagar, ⁴Consultants, Department of Obstetrics and Gynecology, Mother Hospital Pvt Ltd., Pullazhi, Thrissur, Kerala, India.

Corresponding author: Kundoly V Suseela, Professor, Department of Microbiology, Amala Institute of Medical Sciences, Amala Nagar, Thrissur-680 555, Kerala, India

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broth with antibiotics like colistin and nalidixic acid. Subcultures were done from broth on 5% sheep blood agar (SBA) after 24 hour incubation. β lytic colonies on SBA (Fig.1A) were subjected to catalase test, bacitracin susceptibility, Christie Atkins Munch-Petersen (CAMP) test and hippurate hydrolysis. Catalase negative, Bacitracin resistant, CAMP test positive (Fig. 1B) and hippurate hydrolysed colonies were confirmed with serological grouping (Strep check latex). Antibiotic susceptibility test was done by disc diffusion method for ampicillin (10 μ g) and erythromycin (15 μ g) and interpreted according to Clinical and Laboratory Standards Institute (CLSI) guidelines.

STATISTICAL ANALYSIS

Analysis was done using SPSS software version 16. Chi Square test was done. p value <0.05 was considered as significant.

RESULT

Total of 442 swabs were collected from 221 pregnant women at 35-37 weeks of gestation, out of which 24 subjects were positive for GBS (10.8%) (Fig.2) (p>0.05). Eight vaginal swabs were positive on direct plating on SBA (33.3%) whereas 15 vaginal swabs were positive on subculturing from enrichment medium (62.5%) (Fig. 3). Out of 24 GBS isolates, 1 was positive only from rectal sampling. 12.6% of primigravida and 8.8% of multigravida were found to be positive for GBS colonization (Table 1). But are statistically insignificant (p>0.05). All isolates of GBS were found to be susceptible to ampicillin and erythromycin.

DISCUSSION

Maternal GBS colonization can lead to vertical transmission and early onset GBS disease in neonates. It is found to be one of the major perinatal pathogens, both for mothers and their infants, and are associated with significant morbidity and mortality that attendant cost to society. It may also result in adverse obstetric outcome like premature rupture of membrane and preterm delivery.⁷ Even though GBS can invade intact membrane the risk of neonatal disease is more, if GBS ascends after the rupture of membrane.^{4,5} With the CDC recommendations for antenatal screening and IAP in colonized women more studies have come out on these aspects.^{9,8} Some Indian studies show the lower maternal GBS colonization with an average of 10%.^{11,13-15} Our study also shows similar carriage rate (10.8%).

The success of GBS isolation from antenatal women depends on the methods used for sampling with better results from rectal and the media used.¹⁶ We conducted the study by using vaginal as well as rectal swabs in enrichment media from 221 women of which 24 were found to be colonized. The isolation was more from the vaginal swabs than the rectal swabs. In this study, only one case was positive from rectal sampling alone. Badri et al.¹⁷ reported a higher incidence in rectal as opposed to vaginal cultures which suggested that the gastrointestinal tract may be the primary site of colonization and that vaginal colonization may represent

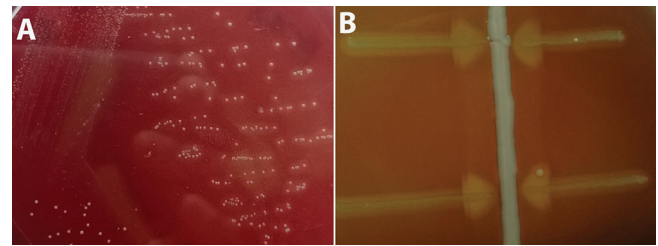


Figure-1: A) β lytic colonies on sheep blood agar B) Christie Atkins Munch-Petersen test (CAMP) positive

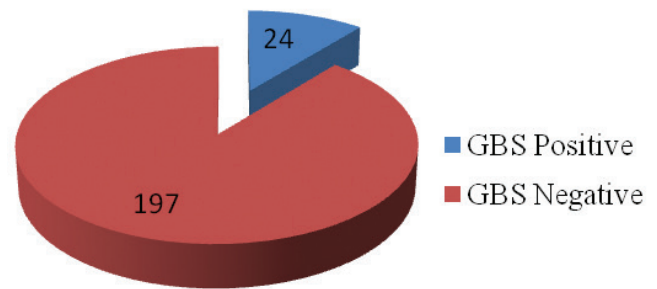


Figure-2: Distribution of group B streptococcal colonization

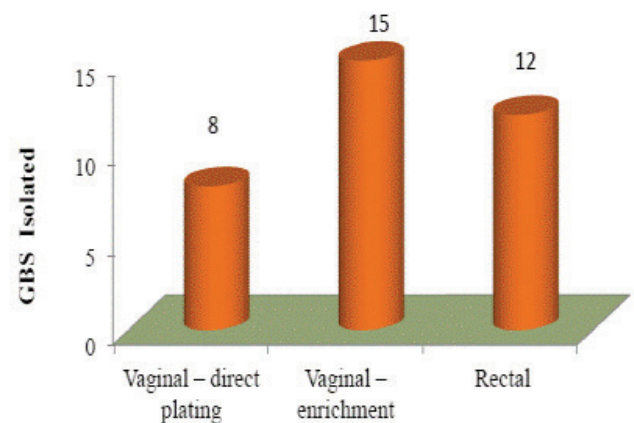


Figure-3: Distribution of group B streptococcal infections in different samples

Gravida	No of women	Positive for GBS	Percentage
Primi	119	15	12.6
Multi	102	9	8.8
Total	221	24	10.8

P > 0.05 (Chi-Square test) non significant

Table-1: Distribution of Group B streptococci among the pregnant women

contamination from this source. In this study, we could isolate 12 from the rectal sampling. The colonization rate in the present study is relatively lower than that obtained in a study conducted in Karnataka where it was 12.67% from vaginal swabs.¹⁴ The reason may be the difference in the geographical area and ethnic groups. GBS colonization rate in the present study was more in primigravida than multi. An Indian study showed GBS resistance to erythromycin and clindamycin.¹⁴ The isolates obtained in the present study were susceptible to ampicillin and erythromycin. The participants who were positive for the GBS were given intrapartum prophylaxis

and found no complications for their babies. A screening may help to avoid the empirical exposure of large numbers of women to antibiotics.

CONCLUSION

The incidence of GBS colonized was 10.8%. The conclusion on the carriage rate of GBS in this area is not possible without an elaborate study. The screening of GBS in antenatal women can be extended to more centers to detect the approximate carriage rate in this area in order to select the intrapartum chemoprophylaxis.

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