Group B Streptococcus Positive Culture's Results in Pregnants with Preterm Premature Rupture of Membranes

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Abstract

Objective: Preterm premature rupture of membranes (PPROM) occurs in 2% of all pregnancies. The aim of this study was to compare positive cultures of GBS in two groups of pregnant women.

Materials and methods: This case control research was conducted on 242 pregnant women: first group was consisted of 117 pregnant with PPROM and gestational ages between 26-37 weeks; second group was consisted of 125 term pregnant women with intact membranes and before onset of labor. Rectovaginal and urine samples were studied using specific culture medium of GBS, "Todd Hewitt Broth". The percentage of positive results was calculated using odds ratio and chi-square test.

Results: GBS cultures were positive in 20 cases (17%) in PPROM group and 5 cases in group of term pregnant (4%) (Odds ratio=4.95 CI= 1.79-13.67, p=0.001). Past history of preterm labor and neonate hospitalization were more common in PPROM group but without any significant relationship to positive cultures.

Conclusion: Our study showed significant difference of GBS colonization rate between two groups (p=0.001). According to CDC and ACOG guidelines routine screening and treatment of positive cases are indicated.

Key words: Streptococcus Beta hemolytic group B, Preterm premature rupture of membranes, Pregnant

Introduction

Prevalence of preterm premature rupture of membranes (PPROM) is 2% of all pregnancies and incidence of subclinical chorioamnionitis in PPROM has been reported to be about 30% to 50% (1). Whether group B streptococci colonization is a cause of PPROM and preterm delivery has been the subject of conflicting reports (2). Twelve percent positive GBS culture's rate and 5% to 20% bacteremia of fetus and mother in intra amniotic infections (IAI) with GBS had been reported (3). GBS infection continues to be a major cause of illness and death among newborns especially in premature infants (4, 5). American College of Obstetrics and Gynecology (ACOG) and Center of Disease Control (CDC) guidelines (2002) advocate on intrapartum culture based treatment of positive cases of GBS (6). Although 15% prevalence of colonization in preterm labor and PPROM had been reported

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Table 1: Frequency of previous neonatal hospitalization in study groups

		Study Groups		P-Value
		PPROM	Control	
History of neonatal hospitalization	Positive	26 (22.2%)	8 (6.4%)	0.001
	Negative	91 (77.8%)	117 (93.6 %)	

(7), but oral antimicrobial agents should not be used to treat women who are found to be colonized with GBS during prenatal screening (8); either to prevent preterm birth or to prevent perinatal infection (4). Debate exists about the best policy in developing countries especially with the aim of reducing preterm labors probably due to heavy colonization of GBS. Our main purpose in this study was to compare GBS colonization rate in pregnant women with and without PPROM.

Materials and methods

This case control research was conducted from January 2005 to December 2006 on 242 pregnant women in two groups. First group was consisted of 117 cases of PPROM and gestational ages between 26-37 weeks; second group was consisted of randomly sampled 125 term pregnancies (37-40 weeks) with intact membranes and before onset of labor. A questionnaire containing maternal characteristics and gestational age, past history of pregnancies and neonatal hospitalization and recent episode of fever was filled for each person. Women were excluded from the analysis if they had vaginal bleeding, vaginal examination before sampling, cervical cerclage, dilation of cervix ≥ 3cm, multifetal pregnancy, antimicrobial therapy in the last 4 weeks, myomatous uterus and immunocompromised diseases. Regarding differences of GBS colonization prevalence in relation to number and sites of sampling and culture medium we utilized distal rectovaginal and urine sterile sampling along with specific culture medium Todd – Hewitt Broth. Two specimens were obtained from each woman. The first was standard culture swab from distal vagina and anorectum. The second was midstream sterile urine. Swabs were placed in Stuart's transport medium. Then specimens were inoculated into selective culture medium "Todd-Hewitt Broth" with sheep blood. In the presence of GBS colonies the results were reported as positive and were compared between two groups using chi-square test, odds ratio (OR) and 95% confidence interval for odds ratio (95% CI for OR). Analysis was done using SPSS 13 (SPSS Inc, USA) software.

Results

Among 242 understudy cases, 17 pregnant women had PPROM and 125 cases were at term with intact membranes. Mean maternal age in PPROM and control groups were 6.5±6.77 (15-41) and 26.66±6.70 (15-43) years respectively. Mean gestational age in PPROM group was 31^{w}, $5^{d}\pm3^{w}$, 4d. History of previous preterm labor was reported in 18 women (15.4%) and 7 women (5.6%) in PPROM and term groups, respectively (P=0.012).

The positive history of past neonatal hospitalization was reported in 26 persons (22.2%) of PPROM and in 8 persons (6.4%) of control groups (p=0.001) (Table 1).

Total GBS colonization rate in case and control groups were 17.1% (n=20) and 4.0% (n=5) respecttively(Odds ratio=4.95 CI=1.79-13.6, p=0.001). Culture results considering the sample site in PPROM group showed positive results for rectovaginal and urine samples to be 17. 1% and 8.5 %, respectively. Results of rectovaginal and urine samples were positive for term pregnancies in 4% and 0.8% (Table 2). GBS colonization in patients with past history of preterm labor showed positive cultures in 2 cases in PPROM group and in none of women in control group. GBS

Table 2: Culture Results of rectovaginal or urine samples in study groups

		Study groups		P-Value	OR	95% CI for OR
		PPROM	Control			
Rectovaginal Specimen	Positive	20 (17.1 %)	5 (4.0%)	0.001	4.95	1.79-13.67
	Negative	97 (82.91%)	120 (96.0%)			
Urine sample	Positive	10 (8.5 %)	1 (0.8%)	0.004	11.58	1.46-92.01
	Negative	107 (91.5%)	124 (99.2%)			

colonization in patients with history of neonatal hospitalization showed positive results in 26.9% of cases in PPROM group and in none of women in control group (p=0.100). The rate of GBS culture in studied groups regarding maternal age below 20 years showed positive results in 3 persons and in none of controls (p=0.23). Interestingly there was no significant relation between fever and positive culture of GBS in PPROM group.

Discussion

Our study showed significant difference between PPROM and control groups in GBS colonization rate (Odds ratio=4.95 CI=1.79-13.6, p=0.001). Feikin et al conducted a study to evaluate association between GBS colonization during pregnancy and preterm delivery. The investigators reported that more women with preterm delivery were colonized at delivery with GBS (14%) than women with term deliveries (7%) (Adjusted odds ratio=3) (2). Also they pointed out that there was no significant association if the cultures were obtained under 24 weeks of gestation (2). They examined 2846 singleton births. Our results were relatively similar; however the sampling site in Feikin's study was cervicovaginal.

Another study in University of Colorado Health Sciences summarized recent studies to make appropriate recommendations. Their main purpose was review on antibiotics effectiveness in reducing premature birth. They notified it is more likely that a true effect of antibiotics has been diluted by inclusion of patients who have premature labor without infection such as patients with preterm labor or PROM at 34 to 37 weeks of gestation (8). We also agree with them that it will be necessary to have earlier intervention before substantial release of cytokines to prevent preterm labor. Contribution of GBS to premature delivery might have demographic differences (2). In developed countries increasing evidence suggests that treating GBS infected new born is more costly than preventing the infection (4). ACOG and CDC guidelines (2002) recommend intrapartum treatment of colonized women; but unfortunately, to date, screening and treatment have not been shown to prevent preterm birth. Debate exists on policies efficacy in developing countries especially in reducing preterm deliveries probably due to heavy GBS colonization. So we advise further clinical trials to evaluate the role of prophylactic screening based treatment. In this regard we notify that the role of treatment in women who have heavy GBS colonization in the late second trimester and early third trimester must be evaluated specifically in our country.

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