

PREVALENCE OF GROUP B STREPTOCOCCUS COLONIZATION AND INTRAPARTUM ANTIBIOTIC PROPHYLAXIS AT MARMARA UNIVERSITY HOSPITAL

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ABSTRACT

Objective: The aim of this study is to identify the rectovaginal GBS colonization rate in pregnant women in our hospital and to evaluate the outcome of culture positive patients who had received intrapartum antibiotic prophylaxis (IAP) according to the protocol of The American Academy of Pediatrics.

Methods: One hundred pregnant women followed at the Obstetrics outpatient clinic of Marmara University Hospital were screened at 35-37 weeks for rectovaginal group B streptococcus (GBS) colonization. The patients with risk factors or positive cultures were treated with parenteral ampicillin during the intrapartum period and the newborn of mothers who had received antibiotic prophylaxis were followed.

Results: Ten patients (10%) had rectovaginal colonization whereas 1 patient had urinary tract infection secondary to GBS. All but 2 patients with GBS colonization received intrapartum antibiotic prophylaxis; one of the GBS colonized patients had immediate cesarean section

delivery for fetal distress and could not receive intrapartum antibiotic prophylaxis, the culture result of the other patient was not known during labor so she could not receive intrapartum antibiotic prophylaxis. The newborn of the GBS (+) patient who had immediate C/S, developed early onset sepsis, GBS antigen was detected in his urine and this newborn was treated with intravenous antibiotics, inotropic agents and needed ventilatory support.

The second infant with GBS colonized but not appropriately treated mother did not have any problems. The newborn of the GBS (+) patients whose mothers had received intrapartum antibiotic prophylaxis were discharged without any complications.

Conclusion: The rectovaginal GBS colonization rate in pregnant women is 10% in our hospital, which cannot be despised. Larger multicenter screening programs are needed to assess the prevalence of GBS colonization and the efficacy of intrapartum antibiotic prophylaxis in our country.

Key Words: Pregnancy, Group B streptococcus infections, Antibiotic prophylaxis.

INTRODUCTION

Perinatal group B streptococcal (GBS) infection is a significant, yet largely preventable, public health problem. It is significant, because it continues to be a major cause of serious infections in pregnant women, fetuses, newborn and immunocompromised patients (1). It is largely preventable, because intrapartum chemoprophylaxis for maternal carriers interrupts vertical transmission (2). Estimates of the most serious infection, neonatal early-onset group B streptococcal disease, vary between 1-4 per 1000 live births in USA and Western Europe (3). The risk of group B streptococcus sepsis in a newborn increases if the mother has rectovaginal colonization. The transmission rate of infection to the fetus is higher in preterm labor, prolonged rupture of membranes and maternal intrapartum fever (3).

The American Academy of Pediatrics Committee on Fetus and Newborn recommends routine antenatal screening of all pregnant women and intrapartum chemoprophylaxis to colonized patients (4). The aim of this study is to identify the frequency of rectovaginal colonization of GBS in pregnant women in our hospital and to evaluate the outcome of culture positive patients who had received intrapartum antibiotic prophylaxis (IAP) according to the protocol of The American Academy of Pediatrics.

MATERIALS AND METHODS

In our study 100 pregnant women between 18-41 years of age followed at Marmara University Hospital, Obstetrics and Gynecology outpatient clinic between January 1999 and June 1999 were screened for rectovaginal GBS colonization. Informed consent was obtained from the patients before the study. Rectovaginal samples which were obtained at 35-37 th weeks of gestation were placed in a transport medium (Amies) then processed in a selective culture media containing nalidixic acid (15 µg/ml) and gentamicin (8 µg/ml). During the intrapartum period, patients with risk factors or positive

cultures were treated with parenteral ampicillin at a dose of 1 gr every 4 hours until delivery. (Fig. 1)

The newborn of mothers who had received antibiotic prophylaxis were followed according to Figure II. All pregnant women and their babies were evaluated for complications such as preterm labor, prolonged rupture of membranes and maternal intrapartum fever or neonatal infections.

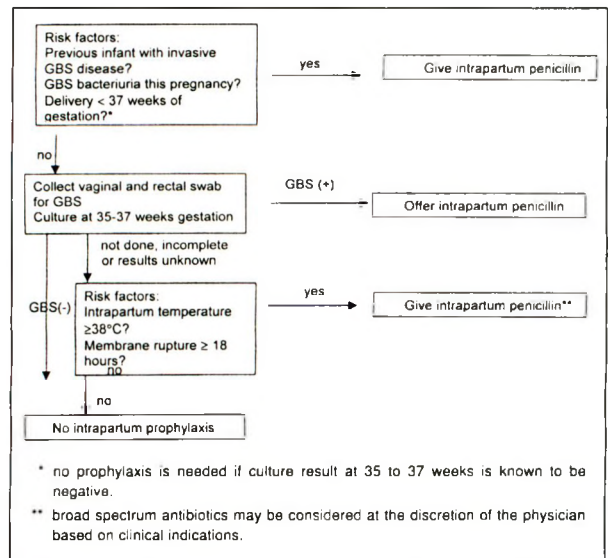


Fig. 1 : Prevention strategy for early - onset GBS disease using prenatal culture screening at 35 to 37 weeks gestation.

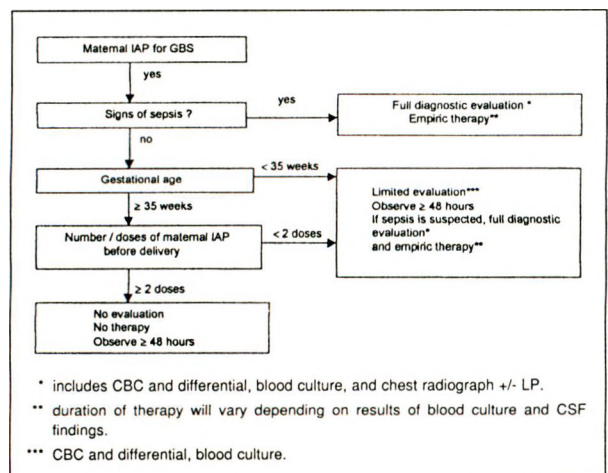


Fig. 2 : Suggested approach for the management of the newborn of mothers with IAP.

Statistical Analysis

Maternal age, gestational age at delivery and birthweight of the offspring of GBS colonized women were compared to those of women without GBS colonization by student's t test. The parity and mode of delivery of the two groups were compared by Fisher's exact test.

RESULTS

The patient population consisted of 100 pregnant women between 18 to 41 years of age. Age, parity, mode of delivery, birthweight and incidence of maternal or fetal infections were not significantly different between the culture positive and negative patients (Table I) ($p > 0.05$). There were no multiple pregnancies, preterm or postterm deliveries. Ten patients (10%) had rectovaginal GBS colonization whereas 1 patient had urinary tract infection secondary to GBS. The multipar patients had not had any infectious complications in their previous pregnancies. All but 2 patients with GBS colonization received intrapartum antibiotic prophylaxis as well as treatment of urinary tract infection when present. One of the GBS colonized patients had immediate cesarean section delivery for fetal distress and could not receive intrapartum antibiotic prophylaxis. The culture result of the

other patient was not known during labor so she could not receive intrapartum antibiotic prophylaxis as well. In both groups there were no complications of pregnancy, labor or delivery such as premature rupture of membranes or maternal infection (Table I).

The newborn of the GBS (+) patient who had fetal distress and could not receive intrapartum antibiotic prophylaxis developed clinical symptoms of sepsis and had full diagnostic evaluation (Fig. 2). Empirical antibiotics were started after cultures were obtained. The urine sample was positive for GBS antigen but blood, urine and cerebrospinal fluid cultures were negative. This newborn was treated with intravenous antibiotics, inotropic agents and needed ventilatory support for 4 days. Although the cultures were negative, the antibiotic treatment was continued for 10 days because of the critical condition of the patient. At the end of the treatment the infant was discharged without any complications. The second infant with GBS colonized but not appropriately treated mother did not have any problems. The other newborn of the GBS (+) patients whose mothers had received more than two doses of intrapartum antibiotic prophylaxis were observed for 48 hours and discharged without any complications.

Table I.: Patients' characteristics.

| | | GBS (-) (n=90) | GBS (+) (n=10) | p |
|---------------------------|------------------|-------------------|-------------------|------|
| AGE (years) | | 28.29 ± 5.28 | 26.0 ± 6.21 | 0,24 |
| PARITY (n) | PRIMIPAR | 39 (43%) | 4 (40%) | 0,45 |
| | MULTIPAR | 51 (57%) | 6 (60%) | |
| GESTATIONAL AGE (weeks) | | 39.21 ± 1.03 | 39.0 ± 1.41 | 0,14 |
| MODE OF DELIVERY n (%) | VAGINAL DELIVERY | 69 (77%) | 6 (60%) | 0,11 |
| | C/S | 21 (33%) | 4 (40%) | |
| BIRTHWEIGHT (grams) | | 3279 ± 362 | 2884 ± 526 | 0,09 |
| PROM* | (n) | - | - | |
| MATERNAL INFECTION | (n) | - | - | |
| NEONATAL INFECTION | (n) | - | 1** | |

* PROM: Prolonged rupture of membranes
 ** The mother of this infant could not receive intrapartum antibiotic prophylaxis.

DISCUSSION

The maternal genital and gastrointestinal tracts are the principal sources of GBS organisms leading to both maternal and neonatal infection. Studies conducted in previous decades reported that the factors influencing GBS colonization were maternal age, socioeconomic status, sexual activity, ethnic origin or mode of contraception (intrauterine device etc.) before pregnancy (3,5). Recent reports indicate GBS colonization rates in pregnant women to be 8-40 % and 50-75 % of their infants become colonized but only about 2% acquire early onset GBS disease (3,6-9). Direct comparisons of the prevalence of colonization reported in the literature are virtually impossible because of the differences in culture techniques employed for study. Gökalp et al have reported that the colonization rate of Turkish women is 8.1 % (9). In our study colonization was detected in 10% of 100 mothers and was not influenced by maternal age, parity, mode of delivery or gestational age at delivery.

Several factors influence the accuracy of detecting colonization in a given population, including: the choice of bacteriologic media, the body sites sampled, the number of cultures obtained. The importance of optimal sample collection and adequate microbiologic technique in determining GBS colonization cannot be underestimated. Gardner et al have shown that 20 % of colonized women will be missed if samples are not collected from both the vaginal orifice and rectum (10). Similarly, Silver et al have reported that 31.9 % of patients with GBS colonization will not show any growth in their cultures if selective culture medium is not used (11). In this study both rectal and vaginal cultures were collected using "Amies" transport medium and the samples were transferred to a selective culture medium as soon as possible.

There is ample evidence to support the efficacy of intrapartum chemoprophylaxis in the prevention of neonatal GBS colonization and early onset disease (2). Several protocols have been suggested for management of colonized pregnant women. The most effective of all in preventing neonatal infections is the use of intrapartum chemoprophylaxis for both colonized women detected at prenatal screening and women with risk factors (4). Several maternal

and neonatal factors (maternal GBS colonization, maternal urinary tract infection (GBS), or intrapartum fever, premature delivery or prolonged rupture of membranes) increase the risk of infection (4,12). On the other hand intrapartum antibiotic prophylaxis significantly decreases the risk of infection. Chemoprophylaxis should start at least 4 hours prior to delivery to achieve therapeutic concentrations in the amniotic fluid. Thus intrapartum prophylaxis should be started as soon as the patient presents for delivery. Oral antibiotics used prior to delivery cannot prevent colonizations (4). Routine prenatal screening at 35-37 weeks of gestation and using intrapartum antibiotic prophylaxis when needed will prevent 86% of all GBS infections (4,13).

GBS infection is thought to be rare in nonindustrialized countries, although this may be changing, similar maternal colonization rates are reported in the literature from developing countries (9). This study also shows that the GBS colonization rates of pregnant women in our hospital is within the ranges reported in the literature. Though we need larger multicenter studies to define the prevalence of GBS colonization and infection, it seems reasonable not to underestimate the GBS problems in our country.

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