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ORIGINAL ARTICLE

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Selective risk factor based screening of pregnant women for Group B streptococcal colonization in a teaching hospital in South India.

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OBJECTIVE(S) : To ascertain the occurrence of group B streptococcal (GBS) carriage among pregnant women and occurrence of neonatal GBS infections in our hospital where a risk factor based screening protocol is followed and to determine the efficacy of such a protocol in preventing neonatal infections and death due to group B streptococci.

METHOD(S) : A retrospective analysis was done of the occurrence of group B streptococcal colonization among 741 pregnant women who were at risk i.e. they had at least one of the following risk factors namely-prolonged rupture of membranes (>18 hours), preterm labor (<37 weeks), intrapartum fever, vaginal discharge, and previous baby with GBS infection, Vaginal swab and urine cultures indicated GBS. The occurrence of neonatal GBS infection was also studied.

RESULTS : The occurrence of GBS colonization was 1.62% and neonatal GBS infection was 0.53 per 1000 live births. There were no cases of invasive neonatal disease or deaths due to GBS.

Conclusion(S) : The low occurrence of GBS colonization (1.62%) and GBS disease (0.53 per 1000), and the lack of invasive neonatal GBS disease and neonatal deaths shows that selective risk factor based screening and antibiotic prophylaxis is an effective protocol for preventing neonatal morbidity and mortality due to group B streptococci.

Key words : group B streptococcus, antenatal screening, neonatal sepsis

Introduction

Streptococcus agalactiae or Lancefields group B streptococci are implicated in neonatal meningitis, septicemia and pneumonia. They may present in neonates as early onset or late onset disease [1]. Early onset disease is usually from the mother before or during delivery. The pathogenesis of late onset disease is less well understood and may involve community or nosocomial infections [2]. Maternal screening and antibiotic prophylaxis can prevent these infections. Two strategies can be adopted in screening for group B streptococci (GBS) – selective risk factor based screening and antibiotic prophylaxis [3] or universal screening and antibiotic prophylaxis i.e. screening of all pregnant women at 35-37 weeks gestation [4,5].

We retrospectively studied the occurrence of group B streptococcal carriage among pregnant women and occurrence of neonatal GBS infections in our hospital where a risk factor based screening protocol is followed to determine the efficacy of such a protocol in preventing neonatal infections and death due to group B streptococci.

Methods

Records of women who attended for antenatal care and delivery, and of the neonates from January 2003 to May 2004 were studied retrospectively. They were examined for details such as fever, pain, prolonged rupture of membranes (> 18 hours), gestational age of the mother, and features of group B streptococcal disease in the neonates. In our hospital, a selective risk factor based screening and antibiotic prophylaxis program is followed and only those mothers

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with preterm labor (>37 weeks), prolonged rupture of membranes (> 18 hours), maternal fever, vaginal discharge or history of group B streptococcal disease in a previous baby were included in this study. Vaginal swabs and urine samples were obtained from these women. In the laboratory, they were inoculated on to 5% sheep blood agar and incubated at 37 degrees centigrade overnight. Suspect colonies were gram stained and biochemical test and the CAMP test were performed to presumptively identify group B streptococci [6]. The women were given 500 mg cefazolin intravenously 4 hourly for 48 hours after collection of vaginal swabs and urine samples.

Cultures (blood, CSF and umbilical swab) were obtained from neonates suspected to have group B streptococcal infection. GBS were detected using the same methods as described above.

Results

During the period of study, there were 1896 deliveries and vaginal swabs were obtained from a total of 741 women (39.1%).

There were 12 GBS positive cervical/vaginal cultures i.e the occurrence of group B streptococcal colonization was 1.62% (12/741). There were no urine cultures positive for GBS. Of the 12 women, six had prolonged rupture of membranes (50%), five had preterm labor (41.67%) and one had fever (8.325%). The average age of colonized women was 23.9 years as compared to 24.2 years for non-colonized women.

None of the colonized women happened to be Rh negative. Of the colonized women, four belonged to the B positive blood group, three to O positive group two to AB positive group. Of the 741 women screened, 257 (34.68%) were B positive, 290 (39.12%) O positive, 148 (20%) A positive and 46 (6.2%) AB positive (Table 1). There is no statistically significant difference in the occurrence of GBS colonization among women of different blood groups.

Of the 12 women colonized, seven (58.33%) belonged to the general ward and five (41.6%) to the private ward. Of the 741 women studied 445 or 60.05% were from the general ward while 296 or 39.05% were from the private ward. There was no statistically significant difference in the occurrence of GBS colonization amongst the women of general and private wards.

Of the 741 women studied 236 or 31.9% had cesarean delivery. Thirty-three percent (4/12) of the women with colonization had needed cesarean delivery compared to 31.80% (232/729) of those without colonization and 29.5% (558/1896) of all the women delivered during the study period. These differences are not significant statistically. Thirteen neonates including a pair of twins, were born to the 12 colonized women. There were no positive blood cultures for GBS among neonates during the study period. There was however one neonate of GBS oomphalitis during the study period; the mother of this child was not cultured because she had none of the risk factors mentioned earlier requiring screening. This represents a rate of 0.53/1000 live births. There were no cases of invasive neonatal disease (blood or cerebrospinal fluid culture positive) or of neonatal death due to GBS during the study period. Four of these 13 neonates had low birth weight.

Table 1. Group B streptococcal colonization among various blood groups (n=741).

Blood Group	GBS (n=12) Positive Percent No.	GBS (n=729) Nagative Percent No.
B	4 33.33	253 34.7
O	3 25	287 39.36
A	3 25	145 19.9
AB	2 16.66	44 6.04
Rh – positive	12 100	687 100
Rh – negative	0 0	42 5.76

Discussion

This study shows that in our hospital, where a risk factor based screening and antibiotic prophylaxis is followed for GBS colonization, the occurrence of GBS colonization in the genital tract of pregnant women is 1.62%. A prevalence of 10.2% and one of 25.4% are reported in similar settings of risk factor based screening [2,8].

There was no significant difference in the occurrence of GBS colonization among women of different blood groups. An earlier study had reported similar findings. There were no women who were Rh negative in those colonized. This is contrary to the findings of an earlier study which reports that a significantly high percentage of Rh negative women were colonized [7]. There was no significant difference in the occurrence of GBS colonization amongst the women of general and private wards. People of low socioeconomic status usually get admitted in the general wards, while those of high socioeconomic status usually get admitted in the private wards.

There was an increase in the percentage of cesarean sections among the women with risk factors but this was not significant.

There was one neonate of GBS oomphalitis during the study period but this was in a non-screened woman who had no risk factor. The occurrence of neonatal GBS disease during the study period was 0.53 per 1000 live born infants and there were no cases of invasive neonatal disease (blood or cerebrostinal fluid culture positive) or neonatal death due to GBS in our hospital during the study period. Previous studies have found a rate of GBS sepsis of 1.04 per 1000 live born over a 5 year period [7], a prevalence of GBS sepsis of 0.57 per 1000 live born over period of 2 years [9] and an incidence of invasive GBS disease of 0.74 per 1000 live born over a one year period [2].

Our study shows that risk factor based screening and antibiotic prophylaxis protocol is efficient in preventing neonatal morbidity and mortality from GBS infection. However, well-planned, prospective studies will be necessary to fully appreciate the magnitude of the problem of group B streptococci in our hospital.

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