The Incidence of Group B Streptococcus in the Vaginal Tracts of Pregnant Women in Central Alabama

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Group B streptococcus (*Streptococcus agalactiae*) or GBS is the most common cause of neonatal sepsis and meningitis in the United States. One important risk factor for infants who acquire GBS is maternal colonization. Colonization rates have been estimated in various studies to be between 15% and 35% of pregnant women. Colonization rates for black women have also been shown to be higher than for non-blacks. Local data were collected and compared to those of other studies. Of the pregnant women in this study overall, 22.76% tested positive for GBS. Black women were colonized by GBS (35.71%) significantly more often than non-black women (19.84%; G = 8.9729, p <0.00274). Generalized linear models were used to examine age and race. Both maternal age and the interaction of maternal race and age as predictors of infection were ruled out, leaving only race as a significant predictor of colonization.

ABBREVIATIONS: GBS = Group B streptococcus.

INDEX TERMS: Group B streptococcus.

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Group B streptococcus (*Streptococcus agalactiae*) or GBS is the most common cause of neonatal sepsis and meningitis in the United States.[1,2] *Streptococcus agalactiae* is a gram-positive coccoid bacterium (pairs or chains), which is β-hemolytic, catalase-negative, pyrrolidonyl aminopeptidase (PYR)-negative, bile solubility-negative, CAMP test-positive, bile esculin-negative, salt tolerance-sensitive, and bacitracin-resistant.[3] Before preventive methods were widely used, approximately 8,000 babies annually acquired GBS disease from their mothers intrapartum, with a 5% mortality rate. Early onset neonatal infection may result in death, disability such as hearing or vision loss, learning disabilities, or recurrent infection.[1,2] An increasing focus on the detection and prevention of GBS disease spread from mother to newborn decreased the incidence of neonatal GBS between 1993 and 1998 by 65%.[1,2]

One important risk factor for infants who acquire GBS is maternal colonization. There is also evidence that maternal colonization with GBS may be associated with increased rates of premature delivery and chorioamnionitis.[2] In her review, Schuchat reported that 15% to 35% of pregnant women are colonized with GBS.[2] Song reported an infection rate of 20.6%, while Yancey reported that 26% of the pregnant women in another study were infected.[4,5]

There is geographic variation in the incidence of early-onset GBS in infants, probably at least in part due to geographic variation in prevention activities.[2] It is not known whether geographic variation in maternal colonization contributes to this variability. Studies specifically addressing geographic variability of GBS in maternal colonization are scanty, thus increasing the importance of this study. With the use of routine screening for maternal colonization now increasing, it would be possible to summarize the collected data from a localized study of the incidence and epidemiology of colonization of GBS among pregnant women in central Alabama. This work reports the results of a localized study and compares them to other studies of the same nature.

MATERIALS AND METHODS

A total of 457 pregnant women were screened for the presence of GBS in the vaginal tract over a period of 12 months from April 1999 through March 2000 (Table 1). Women in this study chose a physician with OB-GYN Associates of Montgomery PC. The physicians in this group ordered GBS cultures on all pregnant women. Cultures were performed at 34 to 36 weeks gestation to indicate the presence or absence of GBS. The physician collected the sample from the outer one-half of the vagina and rectal mucosa using a culturette. Samples were collected throughout the day and sent to the reference laboratory at the end of each day. The

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Table 1. Table of race by score for the incidence of GBS

Race	Positive score	Negative score	Total scored
Black			
Frequency	30	54	84
Percent of Total	6.56	11.82	18.38
Row Percent	35.71	64.29	
Non-black			
Frequency	74	299	373
Percent of Total	16.19	65.43	81.62
Row Percent	19.84	80.16	
Total	104	353	457
Percent	22.76	77.24	100

culturette was inoculated onto Sheep Blood Agar (SBA) and Columbia CNA Agar (CNA), and into Todd Hewitt Broth containing 10µg colistin and 15µg of nalidixic acid per mL. The protocol for analysis followed guidelines recommended in the Manual of Clinical Microbiology.[3] This was a retrospective review of OB-GYN Associates of Montgomery's practice. Since the data were used to review the practice outcomes for assessment of care, the patient data were privileged information to the physicians of this group. The data used for the analysis were compiled by the physician's office to maintain patient confidentiality; no identifying data were recorded other than the race and age of the patient.

Data obtained during this study were compared to the national average. Schuchat also reported that African-American women were more likely to be colonized with GBS than other races.[2] A contingency table was constructed and tested for a relationship between maternal race and GBS colonization in the local data using the G statistic.[6] Finally, a logistic regression was used to model colonization as a function of age (a continuous variable), race, and the interaction of both.

RESULTS

One hundred and four women or 22.76% of the total tested positive for GBS (Table 1). This number is quite similar to nationally reported figures. Black pregnant women were colonized by GBS significantly more often (35.71%) than non-black pregnant women (19.84%; G = 8.9729, p <0.00274). This colonization rate for black women slightly exceeds the maximum of the reported range (15% to 35%).[2]

This study examined age and race combined using generalized linear models. The results of the logistic regression rule out both maternal age and the interaction of maternal race and age as predictors of infection, leaving only race as a significant predictor.

DISCUSSION

The results presented in this study confirm those of other reported studies, in that reported colonization rates fall close to those reported elsewhere. This suggests that geographic variation in GBS colonization is less than anticipated. There was a significantly higher incidence of GBS in black pregnant women as compared to non-black pregnant women, again confirming results found in other geographic locations. Finally, there was no relationship between GBS colonization and maternal age.

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