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Brief Report

Epidemiologic Pattern of Vaginal Colonization by *Group B Streptococcus* in Pregnant Women in Hamadan, Central West of Iran

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Abstract
Group B *Streptococcus* (GBS) is a leading cause of serious neonatal infections. Although great progress has been made in preventing prenatal GBS, its colonization rate in different regions of Iran remains unknown. The objective of this study was to determine the colonization rate of GBS in pregnant women in Hamadan city, Central west of Iran. A group of 544 pregnant women were randomly selected after 20 weeks gestation. Vaginal specimens were examined by Gram staining and culture methods and GBS was identified using bacteriologic criteria. Of these cases, 145 (26.7%) were colonized by GBS. A significant relationship was found between the career of subjects and the related colonization rate. Parity, gestational age, and the number of children were unrelated to GBS colonization. The results are indicating that the relatively high colonization rate of GBS in pregnant women living in Central west of Iran, warrants a routine screening and prophylactic treatment of the infected women.
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Keywords ● Pregnancy ● group B Streptococcus ● vagina ● colonization

Introduction

Certain infectious agents are known to cause fetal infections, among which Group B *Streptococcus* (GBS) is the most common with the incidence rate of 5% to 40 percent.[1] GBS is an important cause of serious neonatal infection.[2] Newborn's infection is divided into two different types including congenital and acquired. The latter can be acquired trans-placentally through birth canal.[3] Neonatal infections are usually encountered in difficult labor, premature birth and premature rapture of membranes. It has been established that the GBS infection during birth can be prevented to a large extent, through an appropriate screening such as *S. agalactiae* in various stages of pregnancy.[4,5] However, controversy exists about the best approach of screening and treatment.[6] Colonization rate varies from one place to another.[7]

Vaginal colonization occurs in 11-30% of all pregnant women, and 50-75% of their infants become colonized usually during labor or birth.[3] There is clear evidence that intrapartum colonization is strongly associated with early onset GBS sepsis with approximately 4% fatal rate and serious morbidities include sepsis, pneumonia, meningitis, osteomyelitis and septic arthritis. There is no general consensus about any specific

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approach in prevention of early onset GBS sepsis. Strategies involve antenatal screening to detect colonization or treatment of women with risk factors such as prolonged rupture of membranes, intrapartum fever, preterm labor and history of maternal colonization during pregnancy which reflects in part, the burden of GBS. Herein, we report the colonization rate of GBS and its successful treatment in Hamadan city, Central west of Iran.

Patients and Methods

A total of 544 pregnant women with gestational age of 20 weeks or more participated in this study. The inclusion criteria included singleton pregnancy, attended to different public and private gynecology clinics. Those pregnant women who were taking antibiotic, suffering from erosions in vagina or cervix, having history of premature rapture of membranes or fever were excluded from the study.

In screening procedures, two vaginal specimens were taken from each woman for bacteriologic examination. The first sample was for Gram-staining and looking for Gram-positive cocci as an initial step of screening, while the second sample was streaked on horse blood agar medium. The agar plate was incubated in a carbon dioxide-enriched environment at 37ºC for 24 hrs. Plates were inspected for ß-hemolytic colonies and Streptococci were identified according to standard laboratory procedures. In brief, colonies were observed for ß-hemolysis and Bacitracin test was done on ß-hemolytic colonies. Bacitracin resistant colonies were examined for hippurate hydrolysis test and if positive, were identified as group B Streptococci (GBS).

Proportion of the subjects with GBS colonization in terms of gestational age, parity and the number of pregnancies and the frequency of colonization among different groups were assessed. Crude odds ratio and 95% confidence intervals were used to estimate the magnitudes of the associations between potential risk factors and overall GBS colonization. The statistical significance was determined using the Chi-square test and $p<0.05$ was considered as statistically significant.

Results

Of 544 pregnant women, 145 (26.7%) were colonized by GBS and the age of the majority of them were (93.8%) between 18 to 35-yrs. The gestational ages of 30.7% of the affected women were between 32 to 37 weeks. However, the infection rate among women with less than 31 weeks of gestations was significantly lower (11.7%) than those more than 31 weeks. The GBS colonization was not significantly related to parity, or to the number of pregnancies.

Discussion

This study demonstrated that colonization during pregnancy with GBS is common amongst an antenatal population. Regardless of the time of testing, approximately more than 26% of women were identified as positive and therefore were eligible for antibiotic therapy during labor. Previous studies showed that the GBS colonization varied from 5% to 40% and was depended on geographical regions, age at pregnancy, sexual activities, and on the accuracy of the bacteriologic methods applied for screening.[8-11]

To prevent GBS disease in neonates, the current recommendation is to screen pregnant women by culture of combined vaginal and anal secretions at 35 to 37 weeks of gestation and to treat empirically those with positive cultures or risk factors for disease transmission. Although some scientists have suggested that the carriage rate of GBS among pregnant women did not change in the first trimester of their pregnancy, the duration of colonization varied, and therefore, screening women at certain points in pregnancy did not necessarily identify carriers of the microrganism at the time of delivery.[11]

The results of present study are indicating that the colonization rate in Group B *Streptococcus* in women living Hamadan, Central west of Iran, is high. Therefore, regarding to the high risk of neonatal infections it is highly recommended to screen pregnant women of 35-37-yrs-old and use prophylactic treatment of GBS colonization in mothers to prevent neonatal infection.

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