

To determine the frequency of Group B streptococcal colonization of vagina in women at 35-37 weeks pregnancy

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Abstract

Introduction: Group B streptococci (GBS) is usually present in the vaginal canal in micro-flora, which usually do not exhibit any symptoms. Instead, in pregnancy, there are certain situations in GBS colonization in the vagina, which may lead to several complications.

Objective: To determine the frequency of Group B Streptococcal colonization of the vagina in women at 35-37-week pregnancy.

Materials & Methods:

Study Design: Cross-sectional survey

Setting: Antenatal clinic, Shalamar Hospital Lahore

Study Duration: 6 months i.e. From: 05-09-2016 to 06-03-2017

350 Booked Patients attending antenatal clinic at Shalamar hospital at 35-37 weeks of pregnancy for routine antenatal check-ups were included. Lower vaginal swabs were taken without speculum using a sterilized disposable cotton swab and transported to Amies Agar jell and transported to the microbiology lab within 24 hours. Laboratory report was collected and reviewed by the researcher regarding positive or negative culture for GBS. Patients with positive GBS culture were given intrapartum antibiotics.

Results: In our study, out of 350 cases, with a mean age of 26.92±4.84 years. The frequency of GBS colonization of the vagina in women at 35-37-week pregnancy was recorded in 12.29% while the remaining 87.71% had no findings of the morbidity.

Conclusion: It was concluded that the frequency of GBS colonization of the vagina in women at 35-37-week pregnancy is not very higher.

Keywords: Pregnancy, last trimester, Group B Streptococcal colonization of vagina.

Introduction

Group B streptococcus (GBS) is one of the leading preventable causes of adverse pregnancy outcomes that can lead to fetal morbidity and mortality worldwide. The burden of maternal and neonatal colonization varies in different demographic and geographic areas. It is recommended by the CDC (centre for disease control and prevention) and the National guideline of the UK, 2002, that all pregnant women should be screened in the late antenatal period for GBS colonization by culture-based strategy so that prophylactic antibiotics should be given to GBS colonized women in the intrapartum period.¹⁻³

Routine antenatal screening in the UK has led to a reduction of 27% in early-onset neonatal GBS disease from 1999 to 2002. Studies indicate that intrapartum antibiotic prophylaxis to GBS carrier women reduces the risk of early onset invasive disease in newborns to as much as 80-95%. GBS is a gram-positive bacterium and is a natural flora of the adult anus and rectum. GBS may also colonize the vagina by ascending infection.^{1,3,4}

Antenatal colonization of the vagina has an effect both on the mother and neonate. In the mother, it may be asymptomatic or may cause cystitis, chorioamnionitis, endometritis, meconium-stained liquor, and even stillbirth. In infants, GBS is one of the most common infections in the first week after birth. The fetus may get an intrauterine infection by ascending infection or the neonate gets infected during passage through the birth canal during delivery. The variety can vary from asymptomatic conditions to meningitis, pneumonia, septicemia, and multi-organ failure. The long-term sequelae are due to meningitis, which are hydrocephalus and cerebral seizure and affect 10% of these infants.¹⁻³

In a systematic review, the prevalence of GBS in the antenatal period was found to be between 6.5-36% in 13 European countries, and in one-third of studies, it was more than 20%. In some studies prevalence in India was calculated as 5%-16%. In a study done at Rawalpindi Medical College, Pakistan GBS colonization was calculated as 8.5%. In another study done in Karachi, Pakistan the prevalence of GBS was found to be 17%.^{1,2,5}

Early onset disease of the newborn due to GBS is a preventable and serious problem as long-term sequelae are hydrocephalus and cerebral seizures. There are very few studies in Pakistan that show a varied prevalence of GBS colonization in the late antenatal period and routine screening is not done for GBS. The

burden of invasive neonatal disease in a newborn can be reduced by antenatal screening and by giving antibiotic prophylaxis to GBS-positive mothers in the intrapartum period. So more studies are needed to know exactly the prevalence of GBS in the late antenatal period in different areas of Pakistan.

Materials and Methods

Study Design: Cross-sectional study

Setting: Shalamar Hospital Lahore antenatal clinic

Study Duration: 6 months From: 05-09-2016 to 06-03-2017

Sample Size: The sample size of n = 350 cases, was estimated by keeping the confidence level at 95%, the margin of error at 5%, and the percentage of GBS i.e. 17% in the third trimester

Sampling Technique: Non-Probability, purpose sampling.

Inclusion Criteria: Any pregnant woman at 35-37 week pregnancy who is booked patient of Shalamar Hospital, coming for routine antenatal checkup willing and giving informed consent for the study.

Exclusion Criteria: Women who were taking or have taken antibiotics in the last week, with pre-labor rupture of membranes on speculum examination, or came with labor pains.

Data Collection: 350 Booked Patients attending antenatal clinic at Shalamar hospital at 35-37 weeks of pregnancy for routine antenatal check-ups were counselled about GBS positive culture and the need for intrapartum antibiotics if culture positive. Detail informed consent was taken. Data were collected regarding demographic information like age, parity, Diabetes mellitus (previously diagnosed or gestational), and previous history of neonatal death due to sepsis. Lower rectovaginal swabs were taken without speculum using a sterilized disposable cotton swab and transported to Amies Agar gel and transported to the microbiology lab within 24 hours. Laboratory report was collected and reviewed by the researcher regarding positive or negative culture for GBS. GBS colonization of the vagina was diagnosed by culture > 2 CFU per swab was considered as post-screening for GBS was done at 35-37 weeks of pregnancy and was assessed by first trimester dating ultrasound. Patients with positive GBS culture were given intrapartum antibiotics. All the data was collected on a pre-designed proforma.

Statistical Analysis: All the data information was analyzed using SPSS v. 16.0. The quantitative variables like age were presented by calculating Mean + SD. The

presence or absence of GBS was presented by calculating frequency and percentage.

Results

Patients were distributed according to age showing that 74% (n=259) were between 18-30 years of age while 26% (n=91) were between 31-40 years of age, with a mean age of 26.92±4.84 years. (Table 1)

The frequency of GBS colonization of the vagina in women at 35-37 weeks of pregnancy was recorded in 12.29% (n=43) while the remaining 87.71% (n=307) had no findings of morbidity. (Figure 1)

Stratification for frequency of GBS colonization of vagina in women at 35-37 week pregnancy with regards to parity shows that out of 43 positive cases 18 were among primigravida women and 25 were multigravida, p-value was <0.01, showing a significant difference. Stratification for frequency of GBS colonization of vagina in women at 35-37 week pregnancy with regards to diabetes mellitus shows that out of 43 positive cases 27 were diabetic women and 16 were not-diabetics, p-value = 0.000 showing a significant difference. Stratification for frequency of GBS colonization of vagina in women at 35-37 week pregnancy with regards to the previous history of neonatal death due to sepsis shows that out of 43 positive cases 31 had neonatal death and 12 had no neonatal death, p-value = 0.000 showing significant difference. (Table 2)

Table 1: Distribution of baseline characteristics of females

	No. of patients
n	350
Age (years)	
18-30	259 (74%)
31-40	91 (26%)
Mean age (years)	26.92±4.84
Parity	
Primigravida	94
Multigravida	256
Diabetes mellitus	
Yes	114
No	236
Neonatal death	
Yes	132
No	218

GBS Colonization

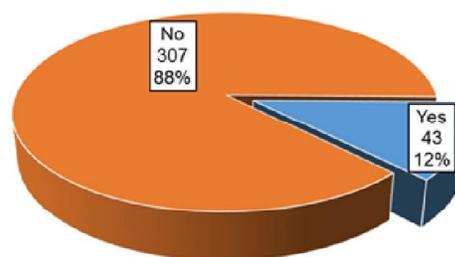


Figure 1: Frequency of GBS colonization of vagina in women at 35-37 week pregnancy

Table 2: Comparison of GBS colonization in different strata

	GBS colonization of the vagina (n=43)		P-value
	Yes	No	
Parity			
Primigravida	18	76	0.01
Multigravida	25	231	
Diabetes Mellitus			
Yes	27	87	0.000
No	16	220	
Neonatal death			
Yes	31	101	0.000
No	12	206	

Discussion

Group B streptococci (GBS) is usually present in the vaginal canal in micro-flora, which usually do not exhibit any symptoms. Instead, in pregnancy, there are certain situations of GBS colonization in the vagina, which may lead to several complications for both; pregnant females and their fetuses. Scholars in the mid-1980s found that the GBS was present in vaginal and anorectal flora of around 30% of females, which can be recurrent, temporary, or permanent.

There are very few studies in Pakistan that show the local prevalence of GBS colonization in the late antenatal period and routine screening is not done for GBS. So more studies were needed to know exactly the prevalence of GBS in the late antenatal period in different areas of Pakistan.

In our study, out of 350 cases, 259 (74%) were aged 18-30 years while 91 (26%) were aged 31-40 years, mean age was 26.92 ± 4.84 years. The frequency of GBS colonization of the vagina in women at 35-37 weeks

pregnancy was recorded in 43 (12.29%) while the remaining 307 (87.71%) had no findings of the morbidity.

The findings of our study are consistent with some studies where prevalence in India was calculated as 5%-16%. In a study done at Rawalpindi Medical College, Pakistan GBS colonization was calculated as 8.5%, which was lower than our study. In another study done in Karachi, Pakistan the prevalence of GBS was found to be 17%, which is slightly higher than our study.^{1,2}

Of the 1,197 pregnant women who were tested for GBS, 110 (9.1 percent) had rectovaginal colonization in a study conducted in Iran to determine the prevalence of rectovaginal colonization with GBS among pregnant women. The mean gestational age of neonates was 32.8 ± 11 weeks, 9.1% of females were positive for rectovaginal GBS colonization, cultures with around 60% transmission to their fetuses. Also, among GBS-colonized women, preterm delivery, prolonged rupture of membranes, and preterm premature rupture of membranes had a higher prevalence, the discrepancy with our research being that in 35-37 weeks of gestation we measured this morbidity.⁶

In a previous study done in the USA among females who had two consecutive deliveries with the positive GBS culture at 35-37 weeks, or detection of GBS colonization to predict the rate of GBS colonization in the next pregnancy in females with and without GBS colonization in the current pregnancy. The recurrence rate of GBS colonization was significantly higher (53%) as compared to females without GBS colonization (15%) (Adjusted odds ratio, 11.7, 95% CI; 3.5-38.9; P<0.01). The rate of GBS colonization was more common in pregnant females of African-American ethnicity and most likely to be multiparous or smoke cigarettes or tobacco. Females positive for GBS colonization have a higher risk of GBS colonization in the next pregnancy. Positive GBS colonization must be deliberated in the risks to manage the unknown status of GBS colonization during labor at term, these data can be utilized to predict the recurrence of complications.⁷

Even though the universal GBS culture-based screening before pregnancy can also seem to be helpful in a significant decrease in the occurrence of early-onset disease, antepartum chemoprophylaxis is not an enduring or comprehensive policy for the prevention of GBS colonization. As vaccines under development are committed to preventing a greater portion of the burden of GBS disease with an easier and more sustainable intervention, additional work on the

development of GBS vaccines and the promotion of clinical phase 3 trials are required.⁸

Before licensing is obtained for a safe, reliable, and economical vaccine, it will be necessary to continue monitoring for possible adverse effects of chemoprophylaxis, with a priority on recording key sentinel incidents, suggesting the need to update the guidelines. These sentinel events include the production of penicillin resistance in GBS that has not been observed to date and a rise in the occurrence of illness or death related to neonatal infections other than GBS that offsets the burden of chemoprophylaxis-prevented early onset disease. Long-term monitoring of a vast population of term and preterm births would include monitoring for the latter.⁹

Conclusion

It was concluded that the frequency of GBS colonization of the vagina in women at 35-37 weeks of pregnancy is not very higher and in accordance with other regions of our country. But in the future we can implement the screening of GBS colonization during pregnancy in order to further decline its incidence.

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