

MANIFESTATION OF MATERNAL VAGINAL COLONIZATION OF GROUP B STREPTOCOCCUS IN PRETERM PREMATURE RUPTURE OF MEMBRANES

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ABSTRACT

Objectives: To look at the manifestation of maternal vaginal colonization of Group B Streptococcus in pre-term premature rupture of membranes.

Methods and materials: This cross sectional study was conducted at Department of Obstetrics and Gynecology, Lady Reading Hospital, Peshawar from November 02, 2020 to May 02, 2021. By using chi square test, Group B streptococcus (GBS) was stratified among age, gravidity, parity, BMI and booking status to see the effect modification value ≤ 0.05 was taken as significant. Those co morbidities that affect the results were excluded. All data was entered, processed, and analyzed on SPSS version 21.0.

Results: Out of total 126 patients, mostly in 15-25 Years of age [04(3.17%), P value, 0.889] were reported as compare to 26-35 Years of age 03(2.38%) and 0.79% years among 36-45 Years. Similarly the frequency of Group B streptococcus (GBS) was prevalent among 15-20 kg/m² category [04(3.17%), P value, 0.083] as compare to 21-25 kg/m² 02(01.58%) and 26-30 kg/m² having 02(01.58%)

Conclusion: The gastrointestinal and vaginal epithelium of healthy women colonized by Group B Streptococcus (GBS) pose a greater risk of serious pathologies in the susceptible infant by a transmission during parturition or ascending intrauterine infection. The incidence of early-onset GBS sepsis has decreased as a result of universal screening and intra partum antibiotic prophylaxis.

Key words: Preterm premature, GBS, rupture of membranes, Group B streptococcus

INTRODUCTION

There is around 15 million preterm births having, 37 weeks of gestation births occur worldwide accounting for about 11% of all live births¹. Membrane rupture before the start of labour contractions is known as premature rupture of membranes (PROM), and if it occurs before 37 weeks of gestation, it is known as preterm premature rupture of membranes (PPROM), which is one of the leading causes of preterm labour and neonatal death in about 2.3 percent of newborns². Preterm labour is still one of the

leading causes of prenatal mortality and neurologic morbidity among these neonates, despite the fact that neonatal mortality has decreased in the twenty-first century³. There is some evidence that intrauterine infection plays a substantial impact in PPRM patients. Amniotic fluid cultures were positive in one-third of women with PPRM. The imbalance in vaginal bacterial colonization during pregnancy leaves these women vulnerable to pathogenic organism colonization^{4,5}.

The predominant pathogen is Group B streptococcus (GBS), which has been found colonising many maternal vaginal tracts in PPRM cases. It is also the leading cause of early newborn sepsis in these nations⁶. As a result, Ampicillin prophylaxis is indicated in these patients according to American

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and Canadian standards⁷.

However, some research in other countries has found completely different results, indicating that other microbes are the predominant PPROM pathogens^{8,9}. The frequency of Group B streptococcus was found to be 30.3 percent in women with preterm premature rupture of membranes in a study by Patel K, et al¹⁰. Another study by Saghafi N, et al. found that 2.2 percent of women with preterm premature rupture of membranes had Group B streptococcus¹¹. Another study by Musilova I, et al. found that 9 percent of women with preterm premature rupture of membranes had Group B streptococcus¹².

To our knowledge, there has been no study conducted locally. International study findings cannot be applied to our population because different populations create different results, as illustrated above^{10,11}. Furthermore, given the significance of maternal genital tract colonization as an etiologic component in PPROM, antibiotic therapy plays a critical role in the prevention and treatment of maternal and neonatal problems. As a result, local data is required in this regard. so our study was focused to look the frequency of maternal vaginal colonization of group B streptococcus in pre-term premature rupture of membranes.

MATERIALS AND METHODS

This cross-sectional study was carried out at the Lady Reading Hospital's Department of Obstetrics and Gynecology, Peshawar from November 02, 2020 to May 02, 2021. Preterm birth is defined as a delivery that occurs before the 37th week of pregnancy (a dating scan or the date of the last menstrual cycle [LMP] while GBS colonisation in pregnant women was defined as GBS isolated from vaginal swabs. Preterm Premature Rupture of Membranes (PPROM) is defined as the spontaneous rupture of foetal amniotic fluid membranes before the commencement of labour in pregnancies of fewer than 37 weeks. A Sample size of 126 was taken by using 9% frequency of Group B streptococcus¹² taking 5% margin of error and 95% confidence interval by using WHO sample size calculator.

By using Nonprobability (Consecutive) sampling, we included all women having reproductive age of 15 – 45 years and having Singleton pregnancy confirmed through ultrasound. Similarly, All women

who have completed more than 24 weeks of pregnancy but less than 37 weeks of pregnancy and diagnosed with PPROM having Any gravidy or parity. They could be booked or unbooked. Similarly, we excluded Women having a congenitally anomalous baby, Preterm labor due to other causes, and having a history of previous preterm delivery and co-morbid conditions.

Before the start of the study, ethical approval was taken from the hospital's ethical committee. Patients were enrolled in the trial in a sequential order through the ER/labor room department. After receiving their informed written consent, all patients were included who presented with preterm premature rupture of membranes as defined by the operational definition. After taking detailed history (about disease history, its signs and symptoms), complete general physical, systemic and gynecological examinations were done. Patients were followed till the culture results of vaginal samples taken for GBS. (Usually 3-5 days). Descriptive statistics were used to calculate for mean + standard deviation (age, BMI, gravidy, parity) for quantitative variables. Frequency was calculated for categorical variables like booking status and GBS. Group B streptococcus (GBS) was tested among age and BMI by chi-square test while Keeping P value ≤ 0.05 was taken. All data was entered, processed and analyzed on SPSS version 21.0.

RESULT

Out of total 126 patients, the age-wise distribution showed that 59 (46.82%) patients were recorded in 15-25 Years Age Group and 47 (37.30%) patients were recorded in 26-35 Years Age Group while 20 (15.87%) patients were recorded in 36-45 Years Age Group. looking at the Mode of Presentation, mostly 83 (65.87%) were recorded as unbooked patients as compared to 46 (34.12%) booked patients. About 44 (34.92%) patients presented between rang 15-20kg/m² as compare to other 37 (29.36%) patients present between range 21-25kg/m², 29 (23.01%) patients present between range 26-30kg/m² and 16 (12.69%) patients present with BMI more than 30kg/m². The distribution of gravidity and parity showed that about half of the 65 (51.58%) patients were primary gravida while 31 (24.60%) patients were multigravida. The frequency of Group B Streptococci showed that 08 (06.34%) were positive, and in 118 (93.65%) patients were absent.

Details are given in Table 1 .

When we tested the distribution of of Group B streptococcus (GBS) among age and BMI,the result showed that mostly among 15-25 Years of age [04(3.17%),P value,0.889] were reported as compared to 26-35 Years of age 03(2.38%) and 0.79% years among 36-45 Years.Similarly the frequency of Group B streptococcus (GBS) was prevalent among 15-20 kg/m2 category [04(3.17%),P-value,0.083] as compare to 21-25 kg/m2 02(01.58%) and 26-30 kg/m2 having 02(01.58%).See the details in Table2

DISCUSSION

Our study was focused to look the frequency of maternal vaginal colonization of group B streptococcus in pre-term premature rupture of membranes. Our result showed that most young age was commonly targeted by this GBS as compared to the old age. As age increases there was low chances of getting infections but our result was not statistical significant. Similarly is with case of BMI.The GBS was most

prevalent in 15-20 kg/m2. As the BMI was increasing there was decreasing in the frequency of GBS. In one study, the rate of maternal colonisation was calculated to be 9.2 percent¹²⁻¹⁴. The global rate of GBS colonization is extremely variable, however, it normally ranges from 6 to 30%. The rate of colonization varies depending on the population and, in particular, the laboratory procedures employed to identify GBS. Further evaluation tests performed in some studies may explain why our population has a lower rate of colonization than that of other emerging countries. Colonization rate for women with preterm premature rupture of membranes was 30% in research by Nomura et al (2006)¹⁵, however, very less percent of the people in our research who had ruptured membrane had a positive GBS culture¹⁶. The geographical variance in GBS colonization best explains this disparity. In our study, on admission, there was no discernible difference in colonization between term and preterm patients. Tsolia et al. (2003) On the other hand, a few other studies^{12,16,17} revealed no link between preterm and GBS colonisation. Researchers demonstrated that prolonged membrane rupture, maternal symptoms of infection, amnionitis, intrapartum foetal monitoring, and having a low birth weight or being born preterm all raise the risk of early onset sepsis in colonized neonates. Younger women were shown to be at a higher risk of premature labour in this study.

Table 1:Descriptive Statistics

Variable	Frequency	Percentages
Age Group		
15-25 Years	59	46.82%
26-35 Years	47	37.30%
36-45 Years	20	15.87%
Presentation		
Booked patients	43	34.12%
Unbooked patients	83	65.87%
BMI kg/m2		
15-20 kg/m2	44	34.92%
21-25 kg/m2	37	29.36%
26-30 kg/m2	29	23.01%
More than 30 kg/m2	16	12.69%
Gravidity & Parity		
Primary Gravida	65	51.58%
Multi Gravida	31	24.60%
Grand Multi Gravida	22	17.46%
Great Grand Multi Gravida	08	06.34%
Frequency of Group B streptococci		
Yes	08	6.34%
No	118	93.65%
Smoking Status		
Yes	00	00%
No	126	100%

Table2: Stratification of prevalence of group B streptococcus (GBS)with respect to AGE and BMI

AGE	Prevalance	Frequency	Percentage	P-value
15-25 Years	Yes	04	3.17%	0.889
	No	55	43.65%	
26-35 Years	Yes	03	2.38%	
	No	44	34.92%	
36-45 Years	Yes	01	0.79%	
	No	19	15.07%	
BMI				
15-20 kg/m2	Yes	04	3.17%	0.083
	No	40	31.74%	
21-25 kg/m2	Yes	02	01.58%	
	No	35	27.77%	
26-30 kg/m2	Yes	02	01.58%	
	No	27	21.42%	
More than 30	Yes	00	00%	
	No	16	12.69%	

This could be due to the fact that these women are exposed to greater contaminated circumstances over time^{18,19}. Gravidity and parity, on the other hand, had no significant relationship with premature labour in main studies which multiparity was found to be linked to a decreased colonization rate²⁰. Due to socioeconomic discrepancies in the population studied, this disparity exists. Despite our center's low rate of GBS colonisation, it can be considered a risk factor for preterm labour. Antibiotic prophylaxis should be considered in these patients.

CONCLUSION

The gastrointestinal and vaginal epithelium of a healthy women colonizes by Group B Streptococcus (GBS) posing a greater risk of serious pathologies in the susceptible infant by a transmission during parturition or ascending intrauterine infection. The incidence of early-onset GBS sepsis has decreased as a result of universal screening and intrapartum antibiotic prophylaxis.

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