ORIGINAL ARTICLE

ANNALS OF PUNJAB MEDICAL COLLEGE

Group B Streptococcus in Asymptomatic Pregnant Women at 35-37 Weeks of Gestation

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Submitted for Publication: 03-06-2020
Accepted for Publication 21-05-2021

How to Cite: Devi R, Kumar J, Jabbar AA, Rekhan R, Seetlani A. Group B Streptococcus in Asymptomatic Pregnant Women at 35-37 Weeks of Gestation. APMC 2021;15(2):97-100. **DOI: 10.29054/APMC/2021.945**

ABSTRACT

Background: A group B streptococcus bacterium is one of the principal cause for death and causing different comorbidities in both mother and their neonates. It inhabits without symptoms in vaginal and rectal areas of the body. There is a great variance in their inhabitant subjecting to topography, hence there is lack of data from Pakistan. **Objective:** To determine the prevalence of Group B Streptococcus in asymptomatic pregnant women at 35-37 weeks of gestation attending the antenatal clinic of JPMC Karachi. **Study Design:** Cross Sectional Study. **Settings:** Department of Obstetrics & Gynecology, Jinnah Postgraduate Medical Centre JPMC Karachi Pakistan. **Duration:** Six months from 1st January 2018 to 30th June 2018. **Methodology:** 163 patients of asymptomatic pregnant women of gestational age 35-37 weeks were enrolled in the study after taking informed consent from patient, high vaginal swab (HVS) and rectal swab were collected from these patients, Presence of GBS was confirmed by standard microbiological studies including graham stain, catalase reaction and hemolytic activity on blood agar plate. **Results:** Mean age was 28.2 ± 4 years; Mean gestational age was 35.8 ± 0.78 weeks. In eleven (6.7%) women group B streptococcus was detected as compared to this one hundred. **Conclusion:** Group B Streptococcus colonization in asymptomatic pregnant women is present in our population so GBS infections in the prenatal and neonatal period might not be uncommon in Pakistan, so routine screening should be carried out.

Keywords: *Group B streptococcus, Asymptomatic pregnant women, Term pregnancy.*

INTRODUCTION

Group B streptococcus (GBS) is one of the most frequent cause of neonatal morbidity and mortality.[1] One in four pregnant women in the US are infected with GBS,[2] which corresponds with the statistics available for Pakistan.[3] It is highly evident in literature that group B streptococcus bacteria have great potential to invade through placental lining and affecting the fetus resulting in wide variety of maternal and fetal outcomes. The outcomes present as infection attacking the body silently to severe sepsis causing preterm labour, rupture of membrane and chorioamnionitis.[4]

Few studies are evident that high mortality rate is associated with early onset of Neonatal GBS that occur within 6 days after birth and present as septicemia, pneumonia or meningitis and vice versa.[5,6] Worldwide, there seems no great variation with the number of cases presented with neonatal GBS related to mortality rate. In accordance, study reported that cases presented with neonatal GBS in two different regions of the world that is United States and United Kingdom had 7% and 10% mortality respectively.[3]

There is a great need to treat this infection which has worst prognosis in long term. Studies have found out that provision of antibiotic during labor has lowered the risk for neonatal GBS and has enhanced maternal outcomes. Hence, there were strategies and policies made by centers for disease control and prevention (CDC) to provide prophylactic treatment in order to reduce perinatal GBS. Consequently, the mortality rate with this infection has been reporting since long time, screening at 35-37 week is recommended in the guidelines.[6-8]

Literature has also found out great variation among different regions of the world with regards to the colonization of this bacteria, where in there is dearth of local data from Pakistan. Hence, the purpose of the study is to determine the frequency of GBS colonization in pregnant women attending the antenatal clinic of JPMC Karachi, thus proper screening can be initiated in

pregnancy to reduce further fatal symptoms and saving new born lives.

METHODOLOGY

Study Design: Cross Sectional Study.

Settings: Department of Obstetrics & Gynecology, Jinnah Postgraduate Medical Centre JPMC Karachi Pakistan.

Duration: Six months from 1st January 2018 to 30th June 2018.

Sample Size: The sample size of this study was calculated by using WHO sample size determination software with 12%[2] prevalence of Group B Streptococcus (GBS) in Pakistan from the previous literature with 95% confidence interval and 5% level of precision. Hence, we enrolled 163 patients for this study

Sample Technique: Non-probability consecutive sampling technique.

Inclusion Criteria: Asymptomatic pregnant women of gestational age 35-37 weeks attending antenatal clinic of JPMC were enrolled in the study after taking informed consent from patient.

Exclusion Criteria: Women with the history of using antibiotics within 2 weeks prior to recruitment, systemic disease (PIH, Hypertension, DM, chronic infectious disease), history of ante partum hemorrhage, vaginal discharge, vaginal leaking and history of fever were excluded.

Data Collection Procedure: High vaginal swab (HVS) and rectal swab were collected from these patients, using sterile swab stick, these swabs directly inoculated into Amies agar media and were transported to main laboratory of JPMC Karachi on same day, where incubated at 37^{0}c for 24 hours then subculture performed in blood agar media. Presence of GBS was confirmed by standard microbiological studies including graham stain, catalase reaction and hemolytic activity on blood agar plate.

Data Analysis: All data was entered and analyzed through Statistical Package SPSS version 20. Chi-square test was applied, $p< 0.05$ was taken as significant.

RESULTS

One hundred and sixty-three women fulfilling the inclusion criteria were included in this study. The mean ± standard deviation age of study population was 28.2 ± 4 years (Table 1).

Table 1: Analysis of age of study population (n=163)

Variables	Minimum	Maximum	Mean	Std. Deviation
Age (In years)	20	35	28.23	4.02
Gestational age/weeks	35	37	35.79	.78

Mean gestational age of study population was 35.8 ± 0.78 weeks (Table 2). Out of 163 women 96(58.8%) had 0-1 parity, 48 (29.4%) had 2-3 parity and 19 (11.6%) had 4-5 parity (Table 2).

One hundred and two (62.6%) women were from rural area and sixty-one (37.4%) women were from urban area (Table 2). On analysis of education level of study population, it was observed that thirty (18.4%) women had primary level of education, fort one (25.2%) had middle level, twenty-three (14.1%) had secondary level, sixteen (9.8%) had graduate level, six (3.7%) had masters level and forty seven (28.8%) women were un-educated (Table 2).

Table 2: Distribution of patients characteristic's (n=163)

Variables	Frequency	Percentage %
Parity		
0-1	96	58.8%
2-3	48	29.4%
4-5	19	11.6%
Geographical location		
Urban	61	37.4%
Rural	102	62.6%
Education level	**Frequency**	%
Primary level	30	18.4%
Middle level	41	25.2%
Secondary level	23	14.1%
Graduate level	16	9.8%
Masters level	6	3.7%
Uneducated	47	28.8%

On analysis of outcome, it was observed that out of 163 women in eleven (6.7%) women Group B streptococcus was detected as compared to this one hundred and fifty-two (93.3%) women were negative for Group B streptococcus (Table 3).

Table 3: Distribution of outcome (n =163)

Group B Streptococcus	Frequency	Percentages
Yes	11	6.7%
No	152	93.3%

On stratification of outcome among the geographical location it was observed that out of 11 Group B streptococcus positive women five belonged to rural area and six belonged to urban area and out of 152 Group B streptococcus negative women ninety-seven belonged to rural as compared to this fifty-five belonged to urban area ($p=0.185$) statistically not significant (Table 4).

On stratification of outcome among the gestational age it was observed that out of 11 group B streptococcus

positive women 5 belonged to 35 weeks gestational age, 3 belonged to 36 weeks gestational age and 3 belonged to 37 weeks. out of 152 group B streptococcus negative women 66 belonged to 35 weeks gestational age, 53 belonged to 36 weeks and 33 belonged to 37 weeks gestational age (p=0.850) statistically not significant (Table 4). Stratification according to age and education are also described in Table 4

Table 4: Stratification for GBS in relation with effect modifiers (n =163)

Effect modifiers	Group B Streptococcus		P-values
	Yes	No	
Age			
15-20 years	0	9	0.407
21-25 years	3	29	
26-30 years	7	72	
31-35 years	1	42	
Location			
Urban	6	55	0.185
Rural	5	97	
Gestational age			
35 weeks	5	66	0.850
36 weeks	3	53	
37 weeks	3	33	
Education level			
Primary level	0	30	0.573
Middle level	3	38	
Secondary level	2	21	
Graduate level	2	14	
Masters level	0	6	
Uneducated	4	43	

DISCUSSION

Researches showed that there are few fatal conditions like cystitis, endometritis and stillbirth are caused by infection of GBS in pregnant women.[9] It is reported that around 17.9% pregnant women are exposed via rectovaginal mode with group B streptococcus.[10] Hence, it is important to initiate antibiotic prophylaxis during delivery in pregnant women.[11] Literature also reported positive association between usage of contraceptive device and GBS. In addition, the risk of exposing to GBS was higher in women with history of multiple pregnancies.[12]

Data had revealed that there is 25% variation among pregnant females with regards to bacterial colonization.[13] Studies also confirmed wide geographical variation in frequency of early onset maternal and neonatal GBS infection, therefore it is mandatory to have local statistics of this disease in order to provide preventive measure accordingly.[14] Stoll *et al*. assessed prevalence vaginal & rectal colonisation in pregnant women and found out variation among statistics worldwide. It was reported that Middle East had highest prevalence (22%) following 19%in Africa and 12% in Pakistan.[15]

Multidisciplinary team plays a vital role in hampering rate of GBS infection. It is the utmost duty of entire healthcare professionals (general practitioners, nurses, assistant etc.) to screen for GBS infection through pregnancy. Prevention of GBS infection during pregnancy requires a multidisciplinary team effort. All healthcare workers who look after pregnant women should screen these patients for GBS. The effective protocol for management of early-onset GBS is provision of antibiotic therapy during delivery. It is recommended by CDC for every pregnant woman to be screen between 35 to 37 weeks for GBS along with antibiotic prophylaxis.[16]

Shrag *et al* emphasised to follow screening guidelines in order to prevent long term morbidity[17] and Dyke *et al* found out that implementing screening strategies during pregnancy has reduced around 30% prevalence of this disease. [18] A study signifies that screening should be done as early as possible which as cost effective first step to reduce incidence of this disease. Moreover, long term prognosis could also manage with preventive measures.[19] Despite of proving utmost treatment and great patient care, researchers found out that it remains one of the major factors in infant morbidity in United States.[20]

In our study, GBS infection carried by mother cases were 6.7% as compare to a study where it was 8.5%, therefore slight regional variation is acceptable. Moreover, there is marked regional variation in the results and it showed around 25 % discrepancy.[8]

A study in Peshawar showed that there were 31% pregnant women who were carrier of this infection.[21] Whereas another study in Lahore showed great fall to 4.5% about this this disease.[22] However, these results do not coincide with this study as the specimens were collected at different time period and GBS is highly subjective to colonization time were as difference is also subjected to population and laboratory methods.[21,22] Few studies revealed that GBS colonisation rate is within 15% in vagina.[23]

In Saudi Arabia, there was almost 20% occurrence of GBS in pregnant women and it is reported that here was no positive association between pregnant women having different complications (diabetes, premature rupture of membrane) with GBS exposure.[24] An Iraqi study revealed that 9.1% prevalence of GBS and there were more than fifty per cent neonates who were infected.[25] Similarly, a Turkish study also reported same findings around 8% which coincides with our study results. As it is already known that during delivery, there are high chances of GBS inhabiting and transmitting to neonate hence there is utmost need for invention of such microbiological

techniques that offer detection of GBS possible in short time period.[26]

There is immense data that is evident about prevention is better than cure. Studies showed that prevention of this disease in early stages is way more cost effective than managing the disease after it has occurred. Up till now, it has been found out that around 250 million pounds is invested every year to treat early onset GBS disease. Hence, it is worth more advantageous to develop protocols and implementing them to prevent this disease at early stage.

CONCLUSION

GBS colonization in asymptomatic pregnant women is not uncommon in our population; it is recommended that all pregnant women should be offered screening policies foe GBS carriage at 35 to 37weeks of gestation in order to decrease neonatal morbidity and mortality.

LIMITATIONS

There were a few limitations to our study. This was a small sample size study. This study was single center-based study, hence might not represent whole population. The study group was not compared with a control group.

SUGGESTIONS / RECOMMENDATIONS

Similar study may be carried out at large population.

CONFLICT OF INTEREST / DISCLOSURE

No / Nil.

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