Prevalence Of Group B Streptococcus (Gbs) Carriage Among Pregnant Women Attending Antenatal Clinic Of University Of Maiduguri Teaching Hospital (Umth)

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Abstract: Of the 133 high vaginal swabs collected from the pregnant women recruited for the study, 13 (9.8%) yielded positive culture for GBS, while 120 (90.2%) were negative. The mean age of pregnant women was 28.71 ± 6.06, years (range 18-42 years). The distribution of the GBS isolate within the age group of subjects as presented in table 4.1, showed high prevalence in the age group of 20 – 29 years (3.8%) followed by 40 – 49 years (3.0%). 30 – 39 years (2.3%) and 10 – 19 years (0.8%) respectively. There was statistically significance in age group ($p<0.05$). demographic characteristics of pregnant women (education and occupation) as presented in table 4.2, showed high frequency of occurrence of GBS isolates was observed in women with tertiary education (6.8%) and house wives (5.3%) respectively. The obstetrics characteristics of the pregnant women as presented in table 4.3, 12 (9.0%) the 13 GBS positive isolates were from pregnant women with double and multiple parity, and 1 (0.8%) with no parity. The gestational age, 13 (9.8%), GBS isolated in the study were from subjects in the third trimester stage while the previous obstetrics outcome showed had experienced neonatal septicemia case, with 1 case each of preterm and premature delivery, while 5 (3.8%) had no previous clinical history. In clinical sign in pregnant women, frequency of occurrence of GBS isolate were as follows, preterm labor 7 (5.3%), followed with those with vaginal discharge 2.3% and those with no clinical sign 2.3% ($P<0.05$). The bacteriological characteristics of the GBS showed that increase puss cells were observed in 2 GBS positive cases while co-infection of GBS and yeast were seen in 3 cases ($p<0.05$).

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Introduction

Lancefield group B-hemolytic streptococcus (GBS), is a gram-positive bacterium of the phylum firmicutes. GBS is characterized by the presence of Group B Lancefield antigen responsible for serious illness observed among newborn infants and the elderly population that could results in death. Clinical importance of GBS infection is not only limited to human population, it has also been implicated in case of bovine mastitis in dairy cows. In most women GBS infection is mostly asymptomatic, as they are either colonized or carriers of the pathogen. GBS infection in neonatal population is acquired through vertical transmission or vaginal canal during delivery [1]. The clinical significance of GBS infection is more pronounced in the neonatal population with presentation of sepsis that could occur within 7 days postpartum which is termed early onset disease (EOD) [2].

Material and Method

The study was conducted in the University of Maiduguri Teaching Hospital between May to October 2019, in collaboration with obstetrics and gynecology department.

Inclusion Criteria

Pregnant women with no apparent signs and symptoms of bacterial infection, pregnant women with no antibiotic therapy for the past two weeks, and those with no signs of erosion in the vagina or cervix.

Microbiological Procedure

A high vaginal swab per subject was collected using sterile speculum and sterile cotton swab. The

properly labeled swab was transported to the laboratory for prompt analysis.

The specimen was plated directly on blood agar plate incorporated with colistin/nalidixic acid (CNA) within one hour and specimen collection in the laboratory and incubated anaerobically at 37°C for 24 hours. Beta hemolytic colonies suspected as GBS were subjected to gram stain and catalase reaction. The presence of Gram-Positive cocci in pair and chains, further identification was done by bacitracin sensitivity testing. Resistant colonies to bacitracin were identified as group B streptococci (GBS).

Microscopic Examination

A fine suspension of the HVS was made on a grease free microscopic slide and covered with cover slip. The suspension was examined at x10 and x40 objective lens for the presence of puss cells and yeast.

Data Analysis

Data generated from the study were analyzed using SPSS version 15.0 values were expressed in means and percentages. Statistical significance between variables were determined by the student t test ($p<0.05$).

Result

The results are shown in Tables 1-4.

Table 1. Distribution of GBS colonization with age group of patients

AGE GROUP	GBS (+)	GBS (-)	TOTAL
10-19	1(0.8)	5(3.8%)	6(4.5%)
20-29	5(3.8%)	65(49.6%)	70(52.6)
30-39	3(2.3%)	43(32.3%)	46(34.6%)
40-49	4(3.0%)	7(4.5%)	11(8.3%)
Total	13	120	133

P=0.0001

Table 2. Demographic variables of the patient with GBS isolates

	GBS (+)	GBS (-)	TOTAL
Education			
Primary	0(0.0%)	4(3.0%)	4(3.0%)
Secondary	3(2.3%)	29(21.8%)	32(24.1%)
Tertiary	9(6.8%)	61(45.9%)	70(52.9%)
Quranic	1(0.8%)	24(18.0%)	25(18.8%)
None	0(0.0%)	2(1.5%)	2(1.5%)
Occupation			
House wife	7(5.3%)	54(40.6%)	61(45.9%)
Business	2(1.5%)	12(9.0%)	14(10.5%)
Civil servant	4(3.0%)	30(22.6%)	34(25.6%)
Student	0(0.0%)	21(15.8%)	21(15.8%)
NYSC	0(0.0%)	3(2.3%)	3(2.3%)

Table 3. Obstetrics characteristics of patient with GBS isolate distribution

PARITY	GBS (+)	GBS (-)	TOTAL
Single	0(0)	25(18.8%)	25(18.8%)
Double (2)	6(4.5)	27(20.3%)	33(24.8%)
Multiple (>2)	6(4.5)	44(33.1%)	50(37.6%)
None	1(0.8)	24(18.0%)	25(18.8%)
			(p<0.05)
GESTATION AGE			
Frist	0(0%)	9(18.8%)	9(6.8%)
Second	0(0%)	27(20.3%)	27(20.3%)
Third	13(9.8%)	84(33.1%)	97(72.9%)
NEONATAL CLINICAL OUTCOME			
Preterm delivery	1(0.8)		8(6.0%)
Neonatal admission	6(4.5)	6(4.5)	12(9.0%)
None	5(3.8%)	88(66.2%)	93(69.9%)
Premature	1(0.8%)	19(14.3%)	20(15.0%)
CLINICAL SIGNS			
PV discharge	3(2.3%)	42(31.6%)	45(33.8%)
Preterm labor	7(5.3%)	9(6.8%)	16(!2.0%)
Premature rupture membrane	0(0%)	1(0.8)	1(0.8)
None	3(2.3%)	68(51.1%)	71(53.4%)

Table 4. Bacteriological characteristics of the GBS isolate

PUS CELLS	GBS (+)	GBS (-)	TOTAL
Significant	2(1.5%)	43(32.3%)	45(33.8%)
Nonsignificant	11(8.3%)	77(57.9%)	88(66.2%)
YEAST CELLS			
Positive	3(2.3%)	61(45.9%)	64(48.2%)
Negative	10(7.5%)	59(44.4%)	69(51.9%)

Discussion

Epidemiological data on BS carriage and colonization have been well documented in developed countries, simply because of the level of awareness and clinical implications of GBS infection especially in neonatal population. In contrast information in developing countries is limited. Therefore, information from this study would shed light on GBS infection and carriage level in pregnant women. In this study the prevalence of GBS carriage among pregnant women was 9.8%, this may be considered to be relatively high. The reason being that, there are no previous epidemiological data on GBS carriage rate among pregnant women in the study area for comparison, nevertheless comparative analysis of the prevalence level with other studies in Africa had shown that the prevalence level is higher than the report from ibadan with prevalence of 1.6% [3]. Prevalence of GBS carriage varied with demographic variables, geographical location, studied population and method of detection. These demographic variables like ae, parity, gestational age and obstetric history of pregnant women contribute significantly to prevalence of GBS carriage [4]. In this study, pregnant women within the age group of 20-29 years (3.8%) and 40-49 years (3.0%) accounted for the significant proportion of the subjects with positive cultures of GBS (3.8%) and (3.0%) respectively. This pattern is in agreement with the report of the other documented studies [5]. These pregnant women are within their active reproductive age and sexual activities are one of the predisposing risk factors for GBS carriage and infection [6]. Parity is also a strong indicative risk factors in GBS infection, 12 of the 13 GBS positive case were from women with multiple parity compared to one from non paricious women. This pattern

underscores the relationship between GBS carriage and parity. Assessing the effect of education of the pregnant women, as pregnant women with Tertiary education had the high prevalence level followed by the Secondary education and the least Quranic. The reason for this pattern is unclear. Personal hygiene and used of tampon during menstruation have been reported as one of the predisposing risk factors [7]. The occupation of pregnant women shows that house wives accounted for (5.2%) as against civil servant (4%) and business women (2%). While the level of income and social status could be a contributory factor, however it is not a known predisposing factor [8].

In this study all the 13(9.8%) positive GBS isolate were recovered from pregnant women at the third trimester stage. This pattern is consistent with other reported studies [7]. The clinical significance of GBS infection is more pronounce in neonatal population that can clinically manifest in early onset and late onset of septicemia [2]. Pregnant women with preterm labor and per vaginal discharge had positive GBS isolated. These clinical outcomes are reported to be associated with GBS infection [9]. The difficulty in laboratory diagnosis of GBS infection is one of the main limitations for inadequate epidemiological information, especially in developing countries. The appropriate sampling procedures are ano-rectal and vaginal swab collected at 35-37 weeks [10]. High vaginal sampling in pregnant women is always difficult as willingness to be subjected to the procedure; this was also experienced in this study despite initial verbal briefings on the clinical implication of GBS infections. This is also responsible for the relatively small number of samples analyzed within the short study duration. Due to the fastidious nature of the organism, selective media like horse and sheep blood agar incorporated with colistin and nalidixic acid are used for easy isolation and identification of GBS. In this study significant puss cell was recorded in 1.5% compared to 8.3% with non-significant pus cell while co-infection with yeast cells (*Candida albican*) was recorded in 2.3% cases.

Conclusion

The prevalence of GBS carriage among pregnant women seen in the study area was 9.8%, this level is considered to be high compared with studies conducted in Nigeria and other Sub-Sahara Africa. These underscore the need for routine bacteriological screening of pregnant women for GBS infection, for more information on epidemiological data.

Ethical Approval

This was approved by the management of UMTH with the number ADM/TH.75/VOL.II, after going through the study design. The pregnant women were properly informed the objectives of the study, by verbal and written communication. Based on their response, the study questionnaire was administered before the specimen collection.

Consent to Participate:

The participants voluntarily agree to participate in the study after going through the consent to participate form, which states that they are free to withdraw at any time or refuse to answer any question without consequence, I understand that participation involves the collection of high vaginal swab using sterile speculum and sterile cotton swab, I understand that I am free to contact any of the people involved in the research to seek for further clarification and information, e. t. c.

Competing Interest:

We declare that there is no competing interest among the authors of this research work.

Consent for publication:

Not applicable.

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Data Availability:

The raw data/processed data required to reproduce these findings cannot be shared at this time due to technical limitations.

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