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Study on Colonization of Group B Streptococcus (GBS) and Relationship with Perinatal Complication in Pregnant Women Referred to Alzahra Hospital

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Abstarct: The Group B Streptococcus (GBS) is one of the most important cause of neonatal Infection and, there is some evidence that it has an important role in vaginal infection with PROM, preterm labor, chorioamnionitis, pyelonephritis, metritis and postpartum infection; many researcher in all around the world try to declare true relation of GBS vaginal colonization with above mentioned complications. If this relation can be proved, its treatment can eliminate related complication. In this study, we searched the rate of GBS colonization in pregnant women that were admitted in Alzahra Hospital and searched for the probable cause and risk factors, correlation of them with postpartum complications with the hope that this study become the first step to show the way for prevention, diagnosis and treatment. In this study, we got two swabs from vagina and rectum of 250 pregnant women that were admitted to labor in Alzahra Hospital. The inclusion criteria was third trimester pregnancy, not used any antibiotics last 72 h before admission and not have any vaginal or rectal exams before taking the sample. Swabs were inoculated in 2 media Blood-agar and Todd Hewitt, then the media transfer to microbiological lab and searched for GBS. All demographic information was collected by a questionnaire from every case and the patients were following up until one month after delivery. In this study the prevalence of positive vaginal GBS culture in pregnant woman was (9.6%). We did not find any significant correlation between this positive culture with gestational age, family income level, post partum infection, neonatal infection and the indication of admission. Correlation with positive rectal culture, age of woman and use of IUD before pregnancy was significant. The most prevalent age of positive vaginal GBS culture was under the 25 year old. In this study significant correlation between vaginal and rectal colonization shows gastrointestinal origin of this organism due to ascending of infection from rectum to vagina. That can be prevented by means of health preventative methods. From contraception methods, the women that had used IUD had more GBS (significant correlation with positive culture of vaginal group B streptococcus) ($p = 0.004$). Correlation between age of women and positive culture of group B streptococcus was significant $p = 0.0001$.

Key words: Group B Streptococcus (GBS), preterm labor, Premature Rupture of Membrane (PROM), postpartum infection, chorioamnionitis

INTRODUCTION

The beta hemolytic Streptococcus Group B (GBS) emerged as a major pathologic threat to infants in the 1960s and continues to be the leading cause of maternal and neonatal morbidity in the 1990s. Current approaches to prevention are directed toward eliminating exposure to the pathogen through chemoprophylaxis or enhancing host resistance through immunoprophylaxis. Because research is advancing rapidly in this area, perinatal advisers should keep their activities in prevention and treatment strategies to enhance patient education and improve care; in this regard we designed a study to search the rate of GBS colonization in the third trimester pregnants that were admitted in Alzahra (a public hospital) as we will mention latter disease may vary due to the prevalence of asymptomatic GBS colonization, the virulence of circulating strains, the frequency of predisposing conditions in each area of the world.

MATERIALS AND METHODS

From the 1st of Jan 2006 to the 1st of June 2006 (6 months) all the patients (250 cases) that were admitted

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to labor or outpatient obstetrical clinic of the Al-zahra hospital of Tabriz-Iran (a training and public center) in the third trimester of pregnancy (after explaining the study and getting informed consent) were tested for GBS by taking a vaginal and rectal sample. The sample was taken by sterile cotton tip swap and after washing the perineum with salen the swap was entered about 2 cm in rectum and turned 360° and transferred to blood agar and Todd Hewitt media then the vaginal swap was entered the vaginal 2/3 depth and the sample was taken by turning the swap 360° and the sample was inoculated in the same medias. For collecting data we had designed a questionnaire on the base of objectives of the design and it was completed for all cases.

The inclusion criteria were third trimester pregnancy and not having any vaginal or rectal examination and not using any antibiotics in the last 72 h examination. All samples were analyzed for the presence of GBS with one of our expert bacteriologist with special consideration of the culture medias and controls and for some cases more searching including catalyze, CMP, hyporate hydrolysis and latex agglutination test were done.

Streptococcus sensitivity to antibacterial agents was searched also.

The patients and their neonates were followed for one month latter for the presence of any of related morbidities. The sample size for study was taken by $n= z^2p (1-p) d^{-2}$.

For Ethics consideration the patients were known by a code for each case and for statistical analysis SPSS Version 14 was used, the results were known as significant as their p-value≤0.005.

RESULTS

In this study there was 9.6% GBS colonization rate (24/250) and the most common reason for admission was active labor, premature rupture of membranes, prenatal care and others (Fig. 1).

In the age group 22.96±3.89 GBS colonization was significantly more (t = 2.9, df = 248, p = 0/004).

In comparison of contraception methods before pregnancy IUD users had more colonization in compare with nonusers (Table 1).

There was close correlation between rectal and vaginal culture (p= 0/0001, df= 0) and in the most of patients with positive GBS vaginl culture rectal culture for GBS was positive that shows the possibility of gastrointestinal origin and must be notified for screening (Fig. 2).

The rate of C-Section and NVD in the case and control was the same 30 and 70%, respectively (Fig. 3).

Table 1: Method of contraception in positive cases

	IUD	OCP	Condom	Others
GBS positive	9	2	3	9

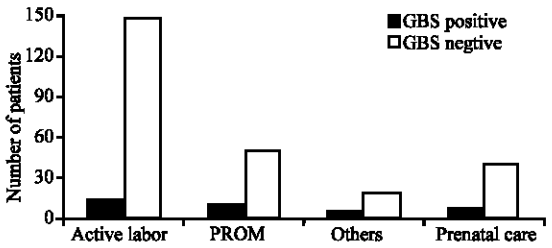

Fig. 1: Chief complaints in admission

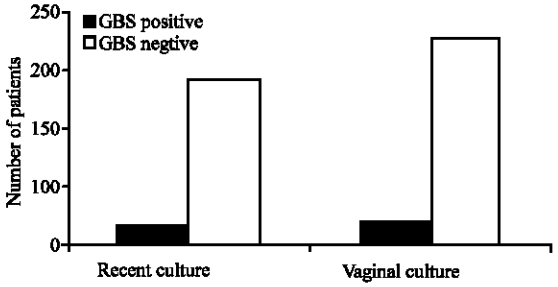

Fig. 2: Frequency of positive and negative rectal culture in GBS positive and negative cervical culture

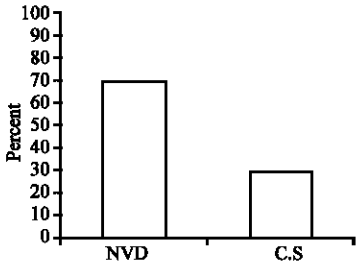

Fig. 3: Method of delivery

We did not have significant febrile morbidity in patients and their neonates though all of the delivered patients had given prophylactic antibiotics.

Total 148 of 250 patients had term pregnancy 66.7% of GBS positive cases had term pregnancy and33.3% had preterm delivery but the age of gestation with the prevalence of GBS wasn't correlated statistically (X = 613, df1, p = 0.434).

We did not find any relation between social and economic class wit GBS colonization (X = 1.86, df = 1, p = 0.175).

DISCUSSION

Group B Streptococcus (GBS) is an important cause of neonatal sepsis in many areas. Although, incidence

data are available for a minority of countries, the magnitude of illness due to this bacterium appears to vary substantially (Breton, 2006).

Disease may vary due to the prevalence of asymptomatic GBS colonization, the virulence of circulating strains, the frequency of predisposing conditions such as low birth weight, or differences in obstetric practices (Schuchat, 1995).

In a study of US there is a report of 20-25% contamination in 35 weeks pregnancy and 15% incidence in term pregnancy (Gary *et al*., 2005). In a study from Greece 6.6% of pregnants had GBS positive cultures (Tsolia *et al*., 2003).

In a report from Pakistan 24% incidence has been reported (Akhtar *et al*., 1987). In Iran the incidence of 14.7% from a study of Tehran and 18% positive GBS cultures from shahrekord has been reported.

We found 9.6% colonization of GBS in Alzahra Hospital a public one in Tabriz. There is several reasons for the difference of colonization incidence in different regions as age of pregnancy, regional health issues, antibiotic use, the method of contraception and age of patients. The rate of GBS colonization differs in different ages of pregnancy as it can colonize transient, frequent or chronically (Gary *et al*., 2005).

Method of contraception is another predisposing factor that must be studied. Age of marry; first age of intercourse, frequency of it all can affect the rate of colonization. Group B streptococcus is supposed to be transmitted from gastrointestinal origin and the sexual behavior can result in contamination of vaginal canal with anal microorganism. The GBS is a sensitive bacteria to most of antibiotics, therefore its colonization is affected by using antibiotics for any reason and it could explain the difference of incidence in different regions (Garland and Kelly, 1995) because of the difference of colonization we need to search the regional incidence and to plan special strategy for each region.

In a study in Spain of the 925 respondents survey demonstrates significant inconsistencies in screening and prophylaxis for group B Streptococcus by specialists in maternal-fetal medicine. In addition, it reveals that the recommendations of The American College of Obstetricians and Gynecologists and the American Academy of Pediatrics are not routinely followed by these specialists. Knowledge of group B Streptococcus carriage significantly increases antepartum and intrapartum treatment regardless of the presence of other risk factors for neonatal sepsis. The impact of this practice on neonatal therapy warrants further evaluation.

In our study the positive colonization of GBS was related with age of patients and it was higher in Youngers while in Greece study there wasn't any relation with age and GBS colonization (mean age of positive culture was 22.96 versus 25.75 of GBS negative). Different vaginal PH in different ages and different methods of contraception predisposes to higher colonization (IUD users had more GBS)11, 4, 8. The socioeconomic statues of patients and positive culture wasn't related but positive culture of rectum and vaginal culture was significantly related.

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