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Research article

PREVALENCE OF GROUP B STREPTOCOCCAL COLONIZATION AMONG PREGNANT WOMEN IN A TERTIARY CARE HOSPITAL IN COASTAL KARNATAKA.

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ABSTRACT: The aim of our study was to evaluate maternal colonization with Group B Streptococci (GBS) which may predispose to adverse neonatal outcome. The study was carried out in a tertiary care hospital in Mangalore for a duration of one year. Duplicate sterile swabs of all samples from vagina of antenatal cases (35 to 37 wks gestation) who visited the Gynaecology OPD and wards were collected. Samples were transported without delay and cultured and identified by biochemical and agglutination tests. The antibiogram for the isolates were performed as per CLSI guidelines. Of the 349 antenatal cases screened during the third trimester for GBS colonization, 29 (8.31%) were found to harbour Group B Streptococcus. The different rates of colonization of GBS in the population has led to the conclusion of potential hazards to neonates among pregnant women warranting mandatory screening of not only vaginal but also urine and rectal samples to get a more reliable result leading to better early intrapartum treatment and safer neonatal outcomes.

Key Words: GBS infection, maternal vaginal colonization, CAMP test

INTRODUCTION

Group B Streptococcus (GBS) is reported as an important cause of maternal and neonatal morbidity and mortality in many studies. Group B streptococci also called *Streptococcus agalactiae*, are Gram positive cocci belonging to Lancefield group B. There are 9 antigenically distinct serotypes based on their capsular polysaccharide structure (Types Ia, Ib, II – VIII). (Anita Shet et.al 2004) Identifying and treating pregnant women who carry Group B streptococci and who are also at highest risk of transmitting the organism to newborns causing septicaemia and meningitis is the need of the hour. The intrapartum use of antibiotics in these women has led unequivocally to a decrease in the rate of neonatal GBS disease. Although studies in India show a predominance of Gram negative bacterial sepsis among infants, contributing to infant mortality, thus it is possible that the role of Group B Streptococcus has been underestimated or under reported.(Hoogkamp-Korstanje JA et.al 1982). GBS is an encapsulated gram-positive cocci in chains that colonizes the gastrointestinal and genital tracts of 15 to 40 percent of pregnant women GBS colonization is usually asymptomatic. However, maternal colonization is the primary risk factor for GBS infection in neonates and young infants (younger than 90 days of age). Vertical transmission generally occurs after the onset of labour or rupture of the fetal membranes. (Baker CJ et.al 2001) In the mid 1980s it was demonstrated that GBS was carried in the vaginal flora in upto 30% of women.(Boyer KM et.al 1983) The present study was conducted to investigate the colonization of GBS in antenatal cases by screening vaginal swabs.

MATERIALS AND METHODS

Duplicate sterile rayon-tipped swabs of all samples from vagina of the suspected antenatal cases (35 to 37 weeks gestation) who came to the obstetrics and gynaecology OPD and wards were collected. The samples were transported to the department of microbiology and processed without delay. The vaginal samples were inoculated onto sheep blood agar, MacConkey's agar and Edwards media. Plates were then incubated at 37°C for 24 hours. Small translucent colonies with beta hemolysis morphologically resembling GBS were subjected to Gram stain, catalase test, hippurate hydrolysis and the CAMP test.

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Hippurate hydrolysis

The test reagent was inoculated heavily with suspected Group B Streptococcus. Hippurate acid was hydrolyzed to benzoic acid and glycine by the enzymatic action of hippuricase and the end product was then detected by the addition of ninhydrin reagent. Development of a deep purple color within 5-10 minutes was considered as positive.

CAMP test

A β hemolytic Plazen strain S. aureus was streaked horizontally on sheep blood agar. Suspected β hemolytic streptococci were streaked perpendicular to S. aureus. The plate was then incubated at 37ºC for 24 hours under 10% CO_2. Arrow head synergistic hemolysis was observed due to CAMP factor in GBS. Confirmatory identification was done by coagglutination test and streptococcal grouping using latex agglutination test. (Streptex Latex Agglutination Assay)

Coagglutination

Antibody coated Cowan A Staphylococcus was mixed with suspension of suspected Group B Streptococcus resulting in agglutination. Agglutination with the reagent confirmed the identity. Reagents for the coagglutination test were procured from Christian Medical College Vellore; a Streptococcal reference centre in India.

Antibiogram

This was performed by the Kirby-Bauer disk diffusion method on Mueller Hinton blood agar according to Clinical Laboratory Standard Institute guidelines. The antimicrobials tested were Ampicillin (10 µg), Clindamycin (2 µg.), Erythromycin (15 µg), Vancomycin (30 µg), Ciprofloxacin (5 µg), Ceftriaxone (30 µg) and Gentamicin (10 µg). S. agalactiae ATCC 27956 was used as a control organism.

RESULTS

349 antenatal cases during third trimester were screened for GBS colonisation and 29 (8.31%) were found to harbour GBS. We had encountered one case of fatal neonatal meningitis and screening of the mother revealed that she harboured GBS in the vagina.

DISCUSSION

GBS is now recognized to be an important cause of maternal and neonatal morbidity and mortality in many parts of the world. The likelihood of neonatal colonisation at birth is higher if the mother is heavily colonised.GBS infection is the leading cause of perinatal bacterial infection, being commonly responsible for septicemia, meningitis and pneumonia in neonates.(Agricola Joachim et.al 2009) Colonization with GBS seems to be more prevalent in patients with excessive vaginal discharge.(John M. Knox.et.al 1979) Review of literature has revealed GBS is significantly associated with prolonged labour, premature rupture of membranes and preterm delivery.(Regan JA et.al 1981). Less commonly, GBS is isolated in cases of post-operative wound infection, pelvic abscess, septic pelvic thrombophlebitis and osteomyelitis. (Anita Shet et.al 2004).

A low incidence of GBS infection has been reported from many Asian countries. The reasons for the low incidence in the Asian population are unclear but may be partly due to low rates of colonization or due to intrapartum antibiotic administration to the mother with risk factors. In addition, many neonates who are colonized with the non-invasive strains may not become ill or septic. In this study vaginal carriage rate (8.31%) was comparable to a study done Das et al (Lakshmi V et.al 1988) where it was 7.5%.Other studies in India showed varying degrees of colonization (2.52%) (Kulkarni et.al 2001) (12.03%) (Dalal B S et.al 1998) A study from Zimbabwe by Moyo et al. showed vaginal and rectal colonisation rates were 12.6% and 6.3%, respectively. (Suara RO et.al 1994). Despite significant GBS colonization rates, reports of invasive neonatal GBS disease in India are scanty. In a 10 year study at Vellore, where only 10 cases of neonatal GBS infection were identified, giving an incidence of 0.17 per 1000 live births.(Kuruvilla KA 1999).

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In the present study a single case of fatal neonatal meningitis was seen. Vaginal swabs of the mother also had GBS while screening.

Screening programs that identify maternal carriers and colonized infants will allow clinicians to identify infants with the greatest risk for Group B streptococcal disease. Because of the early onset of the disease and the high mortality rate reported in other studies, a rapid and accurate method for detecting Group B streptococcus is of primary importance. Hence all pregnant ladies should be screened for vaginal and rectal colonisation on a routine basis.

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