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Medicine

INCIDENCE OF GROUP B STREPTOCOCCUS CARRIER STATE AMONGST ANTE-NATAL WOMEN IN POPULATION OF NORTHEASTERN INDIA

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ABSTRACT

Aim: To find out the incidence of Group B Streptococcus(GBS)carrier state among antenatal-natal patients in population of northeasternIndia.

Method and materials: The study included 986 pregnant females at 35-37 weeks of gestational age attending the antenatal outpatient department at a tertiary hospital in northeast. All participants were screened by a conventional method of two rectovaginal swabs for GBS colonization in Blood Agar media and secondly with serum for antigen detection by rapid latex test for use in qualitative detection of Antigen from GBS by Wellcogen strep B kit. Patients were followed till delivery.

Results and observations: A total of 986 antenatal women were screened for GBS carriage between 35-37 weeks of gestation and were followed till delivery. 162 cases were found to be GBS positive [16.4%] and 824 cases were GBS negative [83.6%]

Conclusion: The incidence of GBS in antenatal population of northeast India is 16.4%

KEYWORDS : Group B Streptococcus, Ante-natal, Carrier State

INTRODUCTION

*Streptococcus agalactiae*or Group B streptococcal (GBS) disease is the leading cause of early onset neonatal sepsis in developed and developing countries. [1] Despite the widespread adoption of preventive strategies in the United States and Australia in recent years [2-4] uncertainty prevails as to whether early onset GBS sepsis is sufficiently common to justify widespread prophylaxis. [5] More recently the GBS Working Group of the Public Health Laboratory Service, UK issued interim recommendations for best practice, to be used while further data are collected. [6] Evidence from both the United States and Australia shows that the adoption of prophylactic policies significantly decreases the incidence of EONS. [4,7]

Little data is available on the prevalence of early onset GBS sepsis in India and the United Kingdom, and no population-based case-control studies on risk factors are available. Such data as there is, implies a prevalence of 0.5-1.15 cases per 1000 live births. Part of the variation in prevalence probably relates to differing characteristics of populations; although some variation is almost certainly related to case ascertainment and, possibly, differences in case definition. [7] In addition, many neonates may become infected with GBS, yet sample taken from them maynot grow bacteria on culture. [8] Interpretation of epidemiological studies may be complicated by the use of antibiotic prophylaxis intra-partum if local practices are not evaluated concurrently. Reports from the developing word infrequently identify the pathogen among newborn with sepsis. [9] Only a few studies have been concluded to find out the incidence of GBS colonization in Indian population but have been inconclusive. [10] Results of GBS colonisation in pregnant women so far have been inconsistent. Universal screening of antenatal patients for GBS colonization and intra-partum antibiotics prophylaxis [IAP] for patients found positive, is already an established routine practice in most developed countries. [11]

In our study we used both culture and antigen/antibody detection methods. Further studies are required to be undertaken to find out the rate of GBS colonization in our population. This study aimed to find out the incidence of GBS in antenatal patients in our population.

AIM: To find out the incidence of GBS carrier state in ante-natal patients in population of northeast India and if GBS infection in pregnant mothers is found at par or more than the incidence seen the world over the routine screening and administration of IAP can be recommended to prevent EONS.

MATERIALS AND METHODS

1. Swab sticks with sterile cotton.
2. Non-selective, non-specific,blood Agar medium.
3. Wellcogen strep B Kit for Antigen detection.

Participants

The study included 986 pregnant females at 35-37 wks of gestational age attending the antenatal outpatient department. All participants were screened by a conventional method of two rectovaginal swab for GBS colonization in Blood Agar media and secondly with serum for antigen detection by rapid latex test for use in qualitative detection of Antigen from group B Streptococci by Wellcogen strep B kit. Patients were followed till delivery. Details with regard to labor and delivery were recorded in all patients. The data of neonates born to GBS positive mother were documented.

Study Protocol

After explaining the procedure and aim of work, rectovaginal swabs were collected for detections of GBS according to Centre for Disease Control and Prevention (CDC)recommendation.For combined vaginal and anal samples, first a swab from the mucosal secretions of the lower third of the vagina was obtained. Thereafter, the same swab was carefully inserted beyond the anal sphincters and gently rotated to touch the anal crypts. The rectovaginal swabs were immediately plated on nonselective, nonspecific blood agar medium.The growth of colonies of GBS was read after 24hours and upto 72hours. Simultaneously urine sample of the patient was collected for further testing of antigen for GBS in the patient by antigen detecting kit (Wellcogen strep B kit).

Principle The rapid latex test for detection of antigen from Group B streptococci is done using polystyrene latex particles coated with group Antibodies. Their latex particles agglutinate in presence of sufficient homologous antigen.

Specimen collection and preparation Five milliliter of urine sample was collected using all standard precautions. The urine sample was heated for five minutes in a boiling water bath. The sample was then cooled to room temperature and clarified by centrifugation.

Test Procedure After shaking the latex reagents, for each test sample place one drop of Test Latex in one circle on a Reaction card and one drop of control latex into a separate circle was placed. One drop of test

sample was dispensed next to each drop of latex by means of a disposable dropper. The contents of each circle were mixed with a mixing stick and spread to cover the complete area of the circle. A separate stick was used for each circle and later discarded for safe disposal after use. The card was rocked slowly and observed for agglutination up to threeminutes, holding the card at normal reading distance [25 to 35cm] for the eyes. The used Reaction card was discardedforsafe disposal.

INTERPRETATION OF RESULTS

Positive Results Clear agglutination of the test latex accompanied by a lack of agglutination of the control latex indicates the presence of GBS antigen in the body fluid supernatant.

Negative Result Lack of agglutination in both reagents means that no group B streptococcal antigen is detectable in the test fluid.

Considering GBS culture as gold standard, the antigen detection by Wellcogen strep B kit was found to be 82% sensitive and 98% specific (Table 1).

Results A total of 986 antenatal women were screened for group B streptococcus carriage between 35-37 yrs of gestation and were followed till delivery. Out of these 520 (52.7%) women were of Gorkhali ethnicity, 303 (30.7%) were of Bengali and 163 (10%) were from other ethnic groups (Table 2). Of total 986, 162 cases were found to be GBS positive [16.4%] and 824 cases were GBS negative [83.6%]. The overall incidence of GBS carriage in antenatal patients in the study sample was 16.4% [Figure 1]. Prevalence of GBS positivity in different ethnic groups was-23.3% amongst Ghorkhali, 8.2% among Bengali and 10% among other women. Table 3 shows that there were 122 GBS (20.23%) positive women between the age of 20-30 years as compare to 40 GBS (10.44%) women between the age of 31-40 years.

DISCUSSION

During the past two decades, GBS or streptococcus agalactiae has emerged as an important cause of perinatal morbidity and mortality. In the present study the incidence of GBS colonization was 16.4% in our population. This is within the often-quoted range of between 5%and 25%. [11,12,13,14] The incidence of GBS carrier state by culture method is 12% in India and Pakistan. [9] The wide range of variation of incidence depends on the patient population, the sites and number of sites sampled. The culture techniques used to isolate the organisms also influence the incidence. Carriage rates in the study by Stoll and Schuchat were similar to the pattern of prevalence of GBS previously reported in other countries outside India. [11] In this screening we used selective broth medium for diagnosis of GBS.

The sensitivity of cultures in detecting GBS colonization varies from 54.87%-85% and results has a slow turn-around time required upto 36 to 72 hours before results can be studied. The culture also requires an experienced technician to identify the suspected colonies.Moreover, the suppression of GBS growth by enterococcus present in the vaginal and rectal flora could lead to false negative results. Although numbers of cases being small, it confirms the incidence of carriage of GBS which has been found in population screening elsewhere. [11,12,13,14] The prevalence of GBS colonization during pregnancy is variable as only 65% of the subjects remained colonized at term, while 8% of those who were found to have negative prenatal cultures were found positive for GBS at term. [15]

As the prevalence rate of GBS carriage in antenatal women is 16.4 %in our population, screening of high risk women for GBS colonization early in labor should be done with rapid test kits available commercially which give reliable results in the presence of heavy colonization with GBS.The sensitivity of the tests depends on whether to identify all colonized patients or those with heavy colonization. [16] Sensitivity of various tests used varies from 40% to 97.7%. More important is the fact that negative predictive value in most tests is reported to be above 95%. Such tests can be used for detection of antigen from GBS in women with high risk,thus avoiding the routine screening by rectovaginal swab for GBS in antenatal women.

In a resource limited country like India, universal culture screening for GBS may be difficult to implement, from a logistic as well as cost-effectiveness viewpoint. However, a strategy based on identifying maternal risk factors could potentially be used. Revised guidelines from CDC that were published in 2002 could be used for this purpose. There is a requirement of large population based multicentric study to substantiate the statistical significance of the data found in our study.

CONCLUSION

The prevalence of maternal GBS carriage is around 16.4% among the ante-natal population of northeastern part of India. An accurate evaluation of the colonization rate with large population based multicentric studies to evaluate prevalence and incidence of GBS carriage in pregnant ladies and also to ascertain the cost-effectiveness of culture and rapid antigen tests for the GBS screening is required. Further studies and guidelines are required to allow for patients' involvement in making decisions based on possible benefits and harms of screening.

FIGURE 1- INCIDENCE OF GBS IN ANC

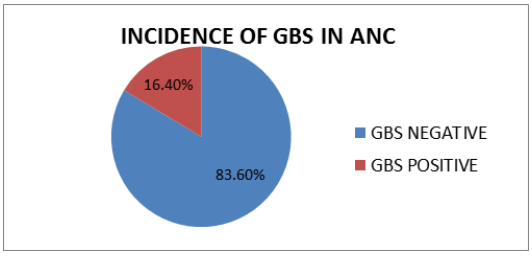

Table 1- Correlation Of Gbs Culture And Antigen Detection

SENSITIVITY AND SPECIFICITY OF GBS DETECTION METHODS

METHOD	SENSITIVITY	SPECIFICITY
GBS Culture	100% [162]	100%
Antigen Detection	82% [132/162]	98%

Table 2- Ethinicity In Gbs Positive Women

ETHINICITY	TOTAL NO OF WOMEN	PERCENTAGE	GBS POSITIVE	PERCENTAGE
GORKHALI	520	52.7	121	23.3
BENGALI	303	30.7	25	8.2
OTHERS	163	16.5	16	10

Table-3- Age Distribution Of Patients In Gbs Carriage

AGE GROUP [YEARS]	No. OF TOTAL ANTENATAL WOMEN	No. of GBS POSITIVE WOMEN
20-30	603	122
31-40	383	40

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