

# Carriage of Beta Haemolytic Streptococci (BHS) in Pregnant Women and Acquisition by Neonates

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## Abstract

Beta Haemolytic Streptococci (BHS) carriage rate in pregnant women during labour and its acquisition by the newborns just after birth was investigated in 60 mother baby pairs. The carriage rate of group B Streptococci (CBS) was 11.6%, acquisition rate by newborns of carrier and non-carrier mothers was 85.7% and 1.8% respectively. A total of 28.5% newborns were carrying CBS on all the skin sites and were heavily colonized and therefore, at higher risk of developing early onset of Streptococcal infections. Penicillin C and Ampicillin were most effective antibiotics against CBS (JPMA 44:256, 1994).

## Introduction

Infections caused by beta haemolytic streptococci (BHS) have long been a primary diagnostic concern and currently considered as pathogenic for humans<sup>1-3</sup>. In recent years several types of BHS have been reported to cause neonatal infections like Sepsis, meningitis and pneumonitis<sup>4</sup>. Complications of rheumatic fever are caused by Group (GAS) A Streptococci<sup>5-7</sup> and puerperal infections like amnionitis, endometritis and sepsis by Group B (GBS) Streptococci<sup>5,8-10</sup>. Beta Haemolytic Streptococci are usually acquired by neonates from the genital tract of the carrier mothers either in uterus or during delivery<sup>11,12</sup> and cause chorioamnionitis, septic abortion, premature rupture of membranes and preterm delivery<sup>5</sup>. Perinatal and neonatal infections are common causes of mortality in neonatal period in Pakistan. This study was undertaken to determine the BHS carriage rate in genital tract of pregnant women during labour and its acquisition rate by newborns and to determine its antibiotic sensitivity pattern to give better understanding of the infection and proper antibiotic use.

## Subjects and Method

Pregnant women with ruptured membranes, admitted to maternity ward of Jinnah Postgraduate Medical Centre (JPMC), Karachi for delivery during the study period of 6 months irrespective of age and parity were included. Diabetic patients and those on antibiotics were excluded. Information regarding biochemical tests was taken from patients' hospital record. High vaginal swabs from mothers were taken before and swabs from nose, throat, umbilicus and groins from new born infants after delivery using sterile dry cotton swabs. They were inoculated directly into sterilized selective broth (containing 10 microgram per ml of Azactam) and incubated at 35-37°C for 18-24 hours and subsequently subcultured onto regular blood agar, chocolate agar and Islam's agar plates and incubated aerobically and anaerobically. Growth was observed after 24, 28 and 72 hours of incubation for BHS colonies on blood agar and chocolate agar and orange red pigmented colonies of UBS on Islam's agar plates. Colonies isolated were Gram's stained and serologically grouped (by using Slidex Strepto Kit) and tested for antibiotic sensitivity against Penicillin G, Ampicillin, Cephalothin, Erythromycin and Septran.

## Results

Sixty mother-baby pairs were studied to find the BHS carriage and acquisition rate in pregnant women and their newborns. Of the sixty mothers 7(11.6%) were carrying GBS (BHS) in their genital tract before delivery. Out of seven babies delivered by carrier mothers 6(85.7%) were colonized by GBS as compared to the one (1.88%) of the 53 babies delivered by the non-carrier mothers. However, the ratios between the two were found to be insignificant.

Table. Comparison of isolation rates of Beta Haemolytic Streptococci in various studies.

Studies	Isolation media and technique applied	Number of mother-baby pairs studied	Carriage rate Total (%)	Acquisition rate Total (%)
Present study	Selective broth containing ten microgram per ml Azactam	60	7 (11.6)*	6 (85.70)
Hayat A. (Thesis) <sup>16</sup>	Non-selective broth (Without antibiotics)	150	14 (9.3)	10 (71.40)
Akhter T. et al <sup>15</sup>	Selective broth containing ten microgram per ml colomycin and 15 microgram per ml Nalidixic acid.	142	44 (30.9)	37 (84.00)

\* P<0.01 - present study Vs Akhter T. et al.<sup>15</sup>

Out of the 7 colonised babies, 28.5% were carrying GBS on all and 71.5% on 2-3 skin sites. The most effective antibiotics were Penicillin G and Ampidillin followed by Septran, Erythromycin and Cephalothin.

## Discussion

The frequency of recovery of Group B Streptococci from vaginal cultures in previous studies has ranged from 5-31%<sup>13-17</sup>. A rate of 11.6% from vagina obtained in our study during labour in women belonging to lower socio-economic class is similar to that encountered in most of these earlier studies. Reported differences may be due to various factors<sup>13,18-22</sup>. The isolation rate of BHS (GBS) from study conducted in Peshawar<sup>15</sup> shows unusually high frequency of BHS than in rate when compared to this and another study done in Pakistan<sup>16</sup>. Media and technique applied in two earlier studies<sup>15,16</sup> were

different from this series (Table). Azactam was used in the study as the selective agent which gives better isolation rate of Gram's positive and some inhibiting action against Gram's negatives whereas other combinations of antibiotics used in previous studies may have some inhibiting effect against the Gram's positive as well. Therefore, Azactam is a better selective agent for allowing growth of Gram's positive such as GBS. Acquisition rate of GBS by newborns of carrier mothers in this study is very high but comparable with other studies<sup>15-17,23</sup>. The greater the colonization of the birth canal, the higher is the risk for acquisition by the neonates and development of overt infection in the newborns and is related to the degree of contamination by the organism. In our study 28.5% of the newborns were heavily colonized indicating an increased risk for development of early onset of sepsis. However, there was no follow up to see if in fact the infection did occur. High frequency of GBS infections suggests that attention should be focussed on the proper detection and management of the disease. This will help in reducing the potential and lethal consequences of this organism. Going back to the low number of cases included in this study and limitations in the follow-up procedures, it is concluded that a more extensive and elaborate study is required.

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