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Research Article

THE CORRELATION BETWEEN MATERNAL CERVICAL SWAB CULTURE AND EARLY ONSET NEONATAL INFECTION IN PREMATURE RUPTURE OF MEMBRANES

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ABSTRACT
Early-onset neonatal infection is an important cause of morbidity and mortality among newborns .This infection, appearing in the first two days of life, is usually the result of exposure to microorganisms of maternal origin. Risk factors for acquired bacterial perinatal infection in the neonate include: maternal fever during labor, preterm or prolonged rupture of membranes, preterm onset of labor, *chorioamnionitis,* maternal urinary tract infection and maternal lower genital tract bacterial colonization (Ungerer *et al.*, 2004). Though the pathogenesis of PROM remains uncertain, infection has since been recognized as its complication for both mother and infant, due to the ascent of cervicovaginal flora through the cervix (Peter, 1999). The bacterial pathogens affecting infants with PROM tend to be those which colonize the anogenital tracts of the mothers.

Key Words: *PROM, Early Onset Neonatal Infection, Cervicovaginal Flora*

INTRODUCTION
The human vagina is colonized by various micro-organisms which may be normal flora or potential pathogens. Lactobacilli are the predominant organisms 70% of which are found in the cervix and vagina of healthy pregnant and non pregnant women (Rudolf Galsk *et al.*, 1976; Richard and SCHWARZ, 1976). Because of their production and tolerance of high acidity which limit the growth of other bacteria, Lactobacilli are regarded as normal flora. Staphylococcus epidermidis and diphtheroides also found in significant percentages (30-60%) in pregnant women are inert in nature. Other organisms which are considered as potential pathogens are grouping D Streptococcus. (10-40%), α and β Hemolytic Streptococcus (-25%), Candida species (20-30%) E.Coli (5-20%) Nisseria species (5-20%), Proteus < 10% and Staphylococcus Aureus (<5%).

Early onset neonatal sepsis is associated with acquisition of microorganisms from the mother, through transplacental infection, or an ascending infection from the cervix , or may be caused by organisms that colonize the mothers' genito urinary tract.They are infected by passage through a colonized birth canal at delivery(Balaska *et al.*, 2003). Microorganisms currently associated with sepsis include group β Strepthococcus, E.Coli, Coagulase negative Staphylococcus, H. Influenzae, Listeria (Balaska *et al.*, 2003).

MATERIALS AND METHODS
This is a prospective study conducted from December 2007 to May 2009 in Sagameshwar Hospital and Basaveshwar Teaching and General Hospital, attached to M.R. Medical College, Gulbarga.

Selection of Cases
All neonates born to healthy mothers with PROM more than 18 hours during their hospital stay were studied in this study. A detailed history was taken including age, parity, Obstetric history of the mother with emphasis on exact time of rupture of membranes, duration history and antibiotics before labour were evaluated. Detailed birth history including resuscitation details, Apgar score and gestational age assessment were evaluated.

In examination of the neonate the pulse, respiratory rate, CFT and temperature were noted followed by systemic examination. Required investigations are done for the neonate and followed during their hospital stay. *Inclusion Criteria:* All neonates born to healthy mothers with PROM more than 18 hours.

Exclusion Criteria

Antepartum hemorrhage
Toxemia of pregnancy
Medical disease in mother other than infection
Meconium aspiration syndrome
Rh or ABO hemolytic disease
Major congenital malformations
Neonates with hyaline membrane disease
Neonates with respiratory distress requiring ventilator support
Mother with PROM of more than 18 hours who have received antibiotics before labour

Following Investigations were Carried Out

Hb% was estimated by automated analyzer
Total leukocyte count (TLC) estimated by automated analyser.
Differential leucocytes count (DLC) done by peripheral smear
Band count estimated by peripheral smear
Toxic granules estimated by peripheral smear
CRP semi quantitative estimation by latex
Blood culture and sensitivity
Urine analysis, urine culture and sensitivity
Chest x-ray (if required)
CSF analysis and head ultrasound (if required)
Cervical swab from selected mothers with PROM of more than 18 hours who have not received antibiotics before labour for culture

RESULTS

Total of 60 neonates were included in this study

Table 1: Comparison according to cervical swab culture

Organism	Asindi *et al.*, (2002)	Kodakay and Telang	Gibbs and Duff	Present study
E. Coli	0	20%	8%	21.7
Klebsiella	13%	11%	0	11.7
Staphylococcus	24%	6%	0	20
Pseudomonas	11.3%	0	0	8.3

Kodakay and Telang study isolated E.coli in 20% cases, Klebsiella 11% cases and Staphylococcus in 6%cases (Kodkani and Telang, 1991). Gibbs and Duff study found growth of E.coli in 8% of cases (Duff *et al.*, 1984).

In the present study commonest organisms isolated was Staphyloccus (20%) followed by Klebsiella (11.7%) and Pseudomonas (8.3%). These results are consistent with Asindi *et al.*, (2002).

Observations

Shubeck et al observed growth of Staphylococcus in 50% of cases followed by Klebsiella in 14% of cases and Pseudomonas in 4% of cases (Shubeck *et al.*, 1966).

Asindi *et al.*, (2002) isolated coagulate negative Staphylococcus in 29% cases, *Klebsiella* in13% and Pseudomonas in 11.3% cases (Asindi *et al.*, 2002).
In the present study Staphylococcus (42.8%) was the most common organism causing sepsis followed by *Klebsiella* (14.2%), *E. col*i (14.2%), *Pseudomonas* (14.2%) and Coagulate negative Staphylococcus(14.2%).

Table2: Organisms isolated in Baby's blood culture

Organism	Asindi *et al.*, (2002)	Shubeck *et al.*, (1966)	Present study
Staphylococcus	-	50%	42.8%
Klebsiella	13%	14%	14.2%
E.coli	-	-	14.2%
Pseudomonas	11.3%	4%	14.2%
Coagulate negative Staphylococcus	29%	-	14.2%

In this study population, the pathogens derived from the genital tract of the women with PROM were predominantly staphylococcus and *Klebsiella pneumoniae* and their infants were colonized predominantly with *staphylococcus, Klebsiella pneumoniae*, and *E.coli*.

Conclusion

Most common organisms isolated in blood culture were Staphylococcus followed by *Klebsiella*, *E.coli, Pseudomonas* and Coagulase negative *Staphylococci*. There was a correlation between organisms isolated from maternal genital tract and baby's blood. By knowing the maternal genital flora treatment of neonates with early onset sepsis becomes easy.

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