

Vertical Transmission of Escherichia coli (E. Coli) Colonization in Healthy Newborns, Born to Mothers with and without E. coli colonization

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ABSTRACT

Background: Escherichia coli early-onset sepsis (EOS) is an important cause of mortality and morbidity in neonates, corresponding to the increasing prevalence in the community, the carriage of E. Coli in pregnant women has also been increased and vaginal E. Coli carriage predisposes newborns to colonization during the birth process.

Aim: Vertical transmission of E.coli colonization in healthy newborn, born to mothers with and without colonization

Methods: This case control study was conducted in the Department of Paediatrics, Services Hospital and Jinnah hospital, Lahore from January to June 2015 (ongoing). The mothers were subjected to vaginal swab and anterior nares swab for E. coli within 6 hours prior to plan delivery. The nasal swab for culture from anterior nares of newborn was obtained within 1 hour of birth. Samples were cultured in Paediatric Microbiology laboratory. Data were analyzed and compared.

Results: Out of total, 80 mothers and their newborns, 10 had E. coli colonization.

Conclusion: E.coli colonization was detected in 12.5% of infants.

Keywords: E coli, newborns, sepsis

INTRODUCTION

Escherichia coli (E. coli) comprise part of the normal vaginal microflora. Transfer from mother to neonate can occur during delivery resulting, sometimes, in neonatal bacterial disease². It has been reported that E. coli colonization persists for up to four years, and therefore the youngest Paediatric patients, specifically neonates, have a high risk of prolonged colonization during a period of time when they are susceptible to significant infections attributable to E. coli³. E. coli colonization or infection in neonates is associated with significant morbidity. Colonization with E.coli has been shown to increase the risk of infection with E. coli both immediately after colonization and in long-term carriers, of whom 26% develop E. coli infections in the year following the identification of their carriage status³.

It might be possible that vaginal E.coli carriage predisposes newborns to colonization during the birth process, however, this mechanism has not yet been well studied². Most common sites of colonization with E.coli include anterior nares, the umbilical cord, skin, and gastrointestinal tract⁶. In pregnant mothers, both nasal and/or vaginal swab culture can be carried out for E.coli colonization with sensitivity of 85.3% and 8.8% respectively⁷.

This study has been designed to document the vertical transmission for E.coli colonization in healthy newborns, born to the mothers with and without E.coli colonization. No data is available on risk factors for E.coli colonization in healthy newborns in Pakistan. By this two centre study, we will be able to document the vertical transmission in healthy newborns, born to mothers with and without colonization so that recommendations can be given to implement the preventive strategies to reduce colonization of E.coli, subsequently leading to prevention of E.coli infection.

The objective of this study is to observe vertical transmission of E.coli colonization in healthy newborn, born to mothers with and without colonization.

OPERATIONAL DEFINITION

E.coli Colonization: Isolation of E.coli from anterior nares (for newborn) and from anterior nares and vagina (for mothers) without evidence of infection

Healthy Newborn: The newborn whose does not need admission or resuscitation, and sample will be taken within 1 hr of birth

Mother: Sample of mother will be taken within 6 hrs prior to the planned delivery

MATERIAL AND METHODS

This is case control study conducted in the Department of Paediatrics, Services Hospital and Jinnah Hospital, Lahore, with duration of 6 months. Sample Size of 160 patients (80 mother and 80

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neonates) is estimated by using 10% level of significance 90% power of test with expected percentage with E. coli as 26%³ and E.Coli colonization as 8.4%⁴ with Sampling Technique of Non-probability convenient sampling

Inclusion Criteria

New born related:

- Newborns of either sex
- Delivered by either route
- Newborn needing no admission and resuscitation within 1 hour of birth

Mother related: Mother of newborns within 6 hrs prior to planned delivery

Exclusion Criteria

Mother related:

- Mother taking any treatment for documented evidence of MRSA infection within 48 hrs prior to delivery
- High risk pregnancy and unbooked mothers.

New born related: Newborns, born at <37 weeks of gestation

Data collection procedure: The study started after informed and written consent taken from father or mother. All the mother and newborns at birth (as per clinical case definition) were included in this study. The demographic profile of newborn recorded. The mother subjected to vaginal swab and anterior nares swab for E.coli within 6 hours prior to planned delivery. The swab taken from outer third portion of vagina. The nasal swab for culture from anterior nares of newborn obtained. After wearing sterile gloves, a sterile swab put into the respective site from mother and baby. Swab removed carefully and put into the transport media Cary Blair Media immediately and sent to the *Paediatric Microbiology laboratory*. Swabs streaked onto a differential media. Colonies growth on differential media were consisted of E.coli.

Data Analysis Procedure: Data analyzed through SPSS 20.0. P value ≤ 0.05 will be taken as significant.

RESULT

Surveillance showed that out of total, 80 mothers and their newborns, 10 had E.coli colonization.

DISCUSSION

In this case control study, all the mother and newborns at birth (as per clinical case definition) included in this study. The demographic profile of newborn recorded. The mother subjected to vaginal swab and anterior nares swab for E.coli within 6 hours prior to planned delivery. The swab was taken from outer third portion of vagina. The nasal swab for

culture from anterior nares of newborn obtained. After wearing sterile gloves, a sterile swab put into the respective site from mother and baby. Swab removed carefully and put into the transport media Cary Blair Media immediately and sent to the *Paediatric Microbiology laboratory*. Swabs will be onto a differential media Each specimen cultured on blood agar and Mckonkey agar Testing methodology same for all the subjects. All plates examined for yellow colored colonies consistent with. coli. If negative, the plates reincubated for another 24 hours, and, if colonies are detected (at 48 hours), then the specimen reported as positive for E.coli.

Out of 80 mothers, 10 had E.coli colonization in vagina and their infants also had E.coli colonization. 8 were baby girls (10%) and 2 were baby boys (2.5%). All of them were born via SVD (100%), no delivery via C-section.

CONCLUSION

E.coli colonization was detected in 12.5% of infants

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