

Implications of microbial colonization at birth in early postnatal morbidities of term neonates

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Objective: To investigate the taxa and clinical implications of immediate postnatal rectal (RC) and nasopharyngeal colonization (NPC) in full term newborn infants sick at birth.

Study Design: In a retrospective cohort single center study, nasopharyngeal (NPCx) and rectal (RCx) microbial cultures were obtained within the first 20 minutes of birth in mild to moderately sick full term infants. Associations between bacterial colonization and maternal and neonatal variables related to early postnatal clinical course were analyzed by performing logistic regression analysis.

Results: A total of 154 full term infants were admitted to the NICU during the designated study period and enrolled with the following diagnoses: respiratory distress, hypoglycemia, maternal chorioamnionitis (CHO) and suspected neonatal sepsis. Out of all enrolled neonates, 80(52%) were NPCx-positive. The duration of rupture of membrane (ROM) was higher (15.5+10.0 vs. 11.3 +11.0 hours, $p=0.02$) while the respiratory support requirement (16.3% vs. 29.7%, $p=0.04$) and period prevalence of maternal GBS colonization were lower (15.0% vs. 35.1%, $p=0.01$) in NPCx-positive infants. ROM increased (OR 1.04, 95% CI 1.01-1.07) and maternal GBS colonization decreased the odds of having positive NP culture (OR 0.31, 95% CI 0.14-0.72). The major microorganisms isolated from NPCx were staphylococcus epidermidis (SE, 41%), alpha hemolytic streptococcus (16%), escherichia coli (*E. coli*, 13%) and group b streptococcus (1.06%). Among the enrolled infants, 44 (28.5%) were RCx-positive. The requirement of any respiratory support (11.4% vs. 27.3%, $p=0.03$) and days on respiratory support (0.2+0.6 vs. 0.8+2.5, $p=0.03$) were lower and the occurrence of CHO higher (41.0% vs. 23.2%, $p=0.04$) in RCx-positive infants. Cesarean section (CS) was performed less frequently (18.2% vs. 55.5%, $p=0.001$) and decreased the odds of having positive rectal cultures (OR 0.21, 95% CI 0.08-0.51). *E. coli* was isolated from 80% of the RCx-positive infants, while 6.8% cultured Klebsiella.

Conclusions: The taxa of NP colonization at birth are dominated by SE, and that of R colonization by *E. coli* in term neonates who are sick during immediate postnatal period. The NP and rectal microbiota as noted in our study population were different from those reported in healthy term neonates. NP colonization is supported by ROM and diminishes with maternal GBS colonization; whereas R colonization declines with CS. NP colonization is more common than rectal in sick term newborn infants at birth. Early postnatal morbidities in full term neonates might be associated with microbial symbiosis.

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What will audience learn from your presentation?

- Learn about the colonization taxa in sick term infants at birth, and its determinants.
- The taxa of sick infants may be different from those who are healthy.
- Cesarean section, maternal antibiotic therapy and prolonged duration of rupture of membranes may adversely affect the fetal-neonatal colonization process.
- Antibiotic stewardship and avoidance of birth by cesarean section may reduce.
- Morbidities in term newborn infants.

Biography

Rita P. Verma is the Chief/Director of Neonatal-Perinatal medicine and the director of pediatric research at Nassau University Medical Centers, New York, USA. She received her medical education in India and trained in Pediatrics and in Neonatal-Perinatal medicine in the USA. She has conducted extensive research in premature human and animal subjects, and published over 120 articles and abstracts in leading journals worldwide. She has delivered numerous keynote lectures nationally and internationally. She serves as a reviewer in major national and international journals in her expertise and is a member of the editorial board of several journals.