



RISK FACTOR OF LATE-ONSET NEONATAL SEPSIS

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ABSTRACT

BACKGROUND-Early-onset sepsis is considered to be acquired from the maternal genital tract whereas late-onset sepsis (LOS) is considered to originate from health-care setting or from the community. There is a lack of etiological data on neonatal sepsis acquired in the community, due to insufficient laboratory facilities in rural areas and potentially low levels of care seeking, resulting in much-unreported morbidity and mortality.

METHODS- This prospective study was conducted on newborns admitted to the Neonatal Intensive Care Unit of our tertiary care hospital. Details of newborns with the final diagnosis of sepsis were reviewed. Neonates with positive blood culture were included in the study.

RESULTS-The multivariate analysis using conditional logistic regression identified that Prenatal use of steroids was associated with a 1.81-fold increased risk of BSIs, although this had no statistical significance

CONCLUSION- In conclusion, we demonstrated that after controlling for gender, birth weight and Apgar scores, the administration of parenteral nutrition, and possibly the prenatal use of steroids remained significant predictors of neonatal BSIs.

KEYWORDS : Neonatal, Sepsis, Risk factor

INTRODUCTION

Early-onset sepsis is considered to be acquired from the maternal genital tract whereas late-onset sepsis (LOS) is considered to originate from health-care setting or from the community. There is a lack of etiological data on neonatal sepsis acquired in the community, due to insufficient laboratory facilities in rural areas and potentially low levels of care seeking, resulting in much-unreported morbidity and mortality.¹

In developing nations, the likelihood of these infections is increased due to unsafe delivery practices, lack of early, and exclusive breastfeeding. The national nosocomial infection surveillance system reports a rate of 14.15 nosocomial infection per 1000 patients. The risk of nosocomial infections is predominantly affected by prematurity, invasive procedures, and duration of stay in the hospital.² These infections are a significant hazard in health-care facilities, causing increased morbidity and mortality in newborns.

MATERIALS AND METHODS

This prospective study was conducted on newborns admitted to the Neonatal Intensive Care Unit of our tertiary care hospital. Details of newborns with the final diagnosis of sepsis were reviewed. Neonates with positive blood culture were included in the study.

Neonates with early-onset sepsis and congenital infections were excluded from the study.

Details of study participants were obtained from case records including birth weight, gestational age, place and mode of delivery, breastfeeding pattern (prelacteal feeds, diluted animal milk, and bottle feeding), invasive procedures, duration of stay in the hospital, and other relevant information. Culture reports with their antibiotic sensitivity pattern were also noted from the records.

Data were analyzed using SPSS Statistics for Windows, Version 21.0. $P < 0.05$ was taken as statistically significant

RESULTS

Table 1. General characteristics

Variable	Case (n=30)	Control (n=30)	p-value
Gestational age (weeks)	31.24±3.21	30.12±4.12	0.236
Birth weight (gm)	1512.32±221.36	1732.12±224.03	0.512
Male : Female	19 : 11	18 : 13	0.654
Mode of delivery (LSCS:NVD)	9 : 21	9 : 21	0.99

Both groups were comparable.

Table 2. Multivariate analysis of risk factors associated with neonatal sepsis by using conditional logistic regression in a matched case-control study

Variable	OR	p-value
Prenatal use of steroids	1.81	0.051
Placement of NG tube	1.12	0.321
Intubation	1.54	0.39
Parenteral nutrition	5.07	0.02
RDS	1.07	0.398
IVH	1.23	0.45

The multivariate analysis using conditional logistic regression identified that Prenatal use of steroids was associated with a 1.81-fold increased risk of BSIs, although this had no statistical significance.

DISCUSSION

Central venous catheter insertion and its duration of use were the main risk factors of nosocomial BSI in premature neonates. In the current study, a central venous catheter (CVC) inserted at a peripheral site was more frequently used in the septic infants than in the control infants.³

The administration of parenteral nutrition was associated with approximately 5-fold greater risk of BSI. The risk factor has also been identified in several previous reports. Sohnet al⁴ reported a 5.7-fold relative risk in infants receiving parenteral nutrition.

Kawagoe et al⁵ demonstrated a 4.0-fold higher risk of nosocomial infections in neonates on parenteral nutrition. Parenteral nutrition has been extensively used to maintain the nutritional condition of critically ill neonates that are intolerant to or in advancing on gastrointestinal feeding. Several plausible theories have been suggested to explain the relationship between parenteral nutrition and neonatal BSI. For instance, an elemental diet and parenteral nutrition may impair the intestinal mucosal barrier and result in bacterial translocation⁶ Longterm parenteral nutrition utilization would also impair host defense mechanisms and bactericidal activity.⁷ In recent years, experts have nevertheless proposed commencing early post-natal parenteral nutrition within 24 hours of birth for increasing positive nitrogen balance, caloric intake and weight gain.⁸⁻¹⁰

Because of the strong association of parenteral nutrition and bacteremia, we speculate the practice may increase the risk of BSIs. This iatrogenic complication should be taken into consideration when implementing this practice into the routine care of preterm neonates.

CONCLUSION

In conclusion, we demonstrated that after controlling for gender, birth weight and Apgar scores, the administration of parenteral nutrition, and possibly the prenatal use of steroids remained significant predictors of neonatal BSIs.

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