

Association between Packed Red Blood Cell Transfusions and Necrotizing Enterocolitis

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Abstract

Background: Necrotizing enterocolitis (NEC) afflicts 6-10% of very low birth weight (<1500 g) infants, and leads to higher morbidity, mortality and increased length of hospital stay

Methods: This study was conducted in 60 preterm neonates, (<34 weeks gestation) who developed necrotizing enterocolitis and evaluated for any blood transfusion 48 h before onset of necrotizing enterocolitis..

Results: Infants with transfusion-associated NEC were older at the time when NEC developed, and had a higher rate of surgical NEC. They were also more likely to have had their feedings held around the time of blood transfusion.

Conclusion: Our data concluded that infants with transfusion-associated NEC represent a subset that is more likely to be seen in smaller VLBW infants. Withholding enteral feedings around the time of a PRBC transfusion also does not seem to be an effective

strategy to decrease the occurrence of transfusion-associated NEC.

Keywords: NEC, RBC, Transfusion

Introduction

Necrotizing enterocolitis (NEC) afflicts 6-10% of very low birth weight (<1500 g) infants, and leads to higher morbidity, mortality and increased length of hospital stay.¹

Several risk factors such as intestinal immaturity, a genetic predisposition and abnormal microbial colonization of the intestines predispose premature infants to develop NEC.²

Recently an association between receiving packed red blood cell (PRBC) transfusions and the onset of NEC has been observed.³ Majority of very low birth weight (VLBW) infants were require one or more PRBC transfusions during the course of their neonatal intensive care unit (NICU) stay. It is unclear whether withholding enteral feedings around the time of transfusion is effective in reducing or preventing transfusion-associated NEC.

Material and methods

Study Design: Hospital based prospective study

Study Place: Department of Pediatrics , PBM Hospital, Bikaner

Study Population: All VLBW infants

Sampling Technique: Random sampling

Inclusion Criteria

- VLBW (≤ 1500 g) and postnatal age of 5 days or less

Exclusion Criteria

- Infant not expected to survive beyond 7 days of life based on the assessment by the treating neonatologist;
- Severe congenital abnormality;
- Receipt of transfusion before enrollment; or
- Maternal decision not to participate.

Data Analysis

All data collected will be entered into Microsoft Excel and will be analysed with help of appropriate software and tests of significance considering level of significance as $p < 0.05$

Results

Table 1: Socio-demographic profile

Variable	Transfusion associate NEC	Other NEC	p-value
Birth weight	990.32 \pm 120.32	1035.24 \pm 240.12	>0.05
Male : Female	14:16	12:18	>0.05

Table 2: Outcome

Variable	Transfusion associate NEC	Other NEC	p-value
Feeding withheld around transfusion	23(76.67%)	12(40.00%)	<0.05

Deaths	10(33.33%)	4(13.33%)	<0.05
Retinopathy of prematurity	11(36.67%)	10(33.33%)	>0.05
Perventricular leukomalacia	5(16.67%)	6(20.00%)	>0.05
Hospital stay days	70.21 \pm 12.98	51.24 \pm 11.24	<0.05

Discussion

Some recent studies have identified a similar association between transfusion and transfusion-associated NEC.⁴

A meta-analysis of several of these studies concluded that there is a strong association between PRBC transfusion and odds of developing NEC.⁵

A more recent meta-analysis has been more cautious in reaching the same conclusion.⁶

On the other hand, two recent reports did not find PRBC transfusion as a risk factor for NEC.^{7,8} Some investigators have reported a significant decrease in the overall NEC rate following the institution of a policy of withholding enteral feedings during and after PRBC transfusion.⁹ However, in our study, 76.67% of transfusion-associated NEC cases had their enteral feedings withheld during the time of transfusion as well as for several hours afterwards, suggesting that withholding enteral feedings around the time of a transfusion may not prevent NEC.

Conclusion

Our data concluded that infants with transfusion-associated NEC represent a subset that is more likely to be seen in smaller VLBW infants. Withholding enteral feedings around the time of a PRBC transfusion also does not seem to be an effective strategy to decrease the occurrence of transfusion-associated NEC.

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