

Draft article

An audit of the practice of red packed cell transfusion in neonatal surgery in an academic hospital

Running title: Transfusion practices and outcomes during neonatal surgery: a 5 year retrospective review

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Data availability statement: The data that supports the finding of this study are available on request from the corresponding author. The data are not publically available due to privacy or ethical restrictions.

Abstract

Background

Neonates undergoing surgery are at greater risk of requiring red packed cells transfusion. Pediatric transfusion practices vary widely between countries and institutions, especially in the management of neonates.

Aims

The aim of this study was to describe the practice of intraoperative red packed cells transfusion primarily, and blood products and fluid transfusion secondarily in neonates presenting for surgery.

Methods

A retrospective contextual and descriptive study was conducted at Chris Hani Baragwanath Academic Hospital. A total of 1077 anesthetic records of neonates who underwent surgery from 1 January 2015 to 31 December 2019 were reviewed. Descriptive and inferential statistics were used to analyze the data.

Results

Three hundred and twenty seven (30%) neonates received intraoperative red packed cells transfusion. The median (IQR) volume of red packed cells, fresh frozen plasma, platelets and clear fluid administered was 15 (10 - 21.8) ml/kg, 12.3 (10 - 23.5) ml/kg, 13.6 (10 - 20.5) ml/kg and 19 (9.1 - 28.8) ml/kg respectively. Very low weight, low preoperative hemoglobin, long total anesthetic time, emergency surgery and major surgery were independently associated with blood product transfusion. Post-conceptual age, low and very low weight, blood product transfusion and major surgery were independently associated with the composite adverse outcomes.

Conclusions

Intraoperative blood product transfusion occurred up to three times more frequently in our study than in comparative studies. Weight-based dosing of red packed cells, blood products and clear fluids were in keeping with current recommendations. Further prospective cohort studies are recommended to inform an institution specific patient blood management program.

Key words: blood transfusion; infant; newborn; surgery

Clinical Implications

Neonatal patient blood management programs are informed by limited scientific data. Current evidence based guidelines do not address the perioperative period. An audit of transfusion practice is the first step in developing evidence based institutional perioperative neonatal transfusion guidelines.