PEDIATRIC PATIENT BLOOD MANAGEMENT PROGRAM IN SCOLIOSIS SURGERY: NET CLINICAL BENEFITS

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INTRODUCTION

- Scoliosis affects 2-4% of children;
- The aim of Pediatric Scoliosis Surgery (PSS) is to avoid worsening of respiratory and cardiac function;
- This surgery is associated with high rates of packed red blood cells (RBC) transfusion (bleeding risk is greater in neuromuscular etiology);
- Patient Blood Management (PBM) programs have been introduced to minimize the use of blood transfusion;
- In January 2016, at our institution, a Pediatric PBM program was adopted in pediatric patients undergoing PSS.

AIM of our study: Evaluate the efficiency of our PBM program.

METHODS

2013-2015

Before implementation of PBM (Control Group)
No. of patients 59

2016-2017

Introduction of PBM in PSS (Multidisciplinary team)

After implementation of PBM
No. of patients 52

Preoperative (=1 month before surgery)

Immunohemotherapy appointment:
- Evaluation of bleeding/Thrombotic risk;
- Screening for anemia and/or iron deficiency

OPTIMIZATION of Hb if:
- 9 g/dL ≤ Hb ≤ 12 g/dL
- OR
- 12 g/dL ≤ Hb ≤ 15 g/dL + Ferritin (<60) + Transferrin Saturation (TS) (<20%)

Screening of Hemostasis:
- Platelet function (Agonists used: ADP; TRAP; Ristocetin) – Multiplate analyzer
- aPTT; PT; Fibrinogen – Coagulometric assays

Intraoperative

Intraoperative infusions:
- Tranexamic Acid:
  - Bolus 20 mg/Kg (prophylactic);
  - Continuous Infusion (IV) 10 mg/Kg per hour during surgery.
- Prophylaxis or therapy of haemorrhagic diatheses:
  - Desmopressin (DDAVP) – 0.3 µg/Kg:
    - 30 min before surgery if platelet dysfunction;
  - At least 2 Agonists Decreased
  - Fibrinogen (Fib.) and ROTEM test during surgery:
    - 20-30 mg/Kg if Fib. < 2 g/dL.
  - Specific Coagulation Factors if necessary;

Evaluation:
- Hemoglobin – after surgery (during the first 24 hours);
- Length of stay at Pediatric Intensive Care Unit (PICU) (days).

2013-2015

No. of patients=59
Median Age = 13.5 years

Scoliosis Etiology (%)
- Idiopathic – 67%
- Neuromuscular – 33%

2016-2017

No. of patients=52
Median Age = 13.5 years

Scoliosis Etiology (%)
- Idiopathic – 47%
- Neuromuscular – 12%

RESULTS

2013-2015

Preoperative Hb (median g/dL)
13.2

Postoperative Hb (median g/dL)
9.3

Number of packed RBCs transfused (median)
2

Length of Pediatric Intensive Care Unit admission (median days)
3.06

2016-2017

Preoperative Hb (median g/dL)
13.4

Postoperative Hb (median g/dL)
10.0

Number of packed RBCs transfused (median)
0

Length of Pediatric Intensive Care Unit admission (median days)
1.85

PBM Program

- Iron supplementation
  - No. of patients 40 (oral intake or IV);
  - Mean dose (oral intake) = 4 mg/Kg;
  - Mean dose (IV administration) = Ferric carboxymaltose and iron sucrose=20.08 mg/Kg and 9.3 mg/Kg;
- Impairment of Platelet function
  - No. of patients: 8 (DDAVP prophylaxis);
- Administration of Factor Concentrates
  - No. of patients: 1 – Administration of coagulation FVII concentrate.

CONCLUSIONS

- The median of packed RBCs consumed in the perioperative period decreased from two (2013-2015) to zero (2016-2017);
- The length of stay at PICU followed the same pattern, prior to PBM the patients had a median stay of 3 days at PICU, after PBM implementation they only spend 1.85 days at the unit;
- The implementation of the PBM program allowed for a substantial decrease of packed RBC transfusion and length of PICU admission.

REFERENCES:

Clinical Case
Female Patient; 18 years old
Idiopathic Scoliosis
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