RED BLOOD CELL EXCHANGE IN SICKLE CELL DISEASE

Technical And Nursing Aspects

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May 5, 2015
DISCUSSION POINTS

- Impart knowledge on Technical Aspects of Intravenous Vascular Access with Red Blood Cell Exchange procedures
  - What are the Access options for Acute and Chronic RBCx
  - What are the options for implantable ports along with their advantages and disadvantages, accessing issues, durability, and effects on patient lifestyles
  - What are the optimal anticoagulants and techniques for flushing and locking access lines
  - Sedation verses no sedation in children receiving RBCx

- Review Nursing aspects in caring for a patient with Red Blood Cell Exchange
TECHNICAL ASPECTS
INTRAVENTOUS ACCESS

Informal Survey Data
N = 14
• Adult patients - 40%
• Pediatric - 20%
• Both - 40%

Peripheral IV
• What percentage of Erythrocytapheresis procedures are performed with PIV access?
Central Venous Access Devices

- What percentage of Erythrocytapheresis procedures are performed with CVL access
  - Flexible Catheters – 30%
  - Implantable Ports – 70%

% of Central Venous Catheter Usage

- 0 to 24%
- 25 to 49%
- 50 to 74%
- 75 to 100%

Respondents
PERIPHERAL IV ACCESS

Access – Draw line
- 16g to 20g
- Steel Needle
  - Medisystem® fistula needle
  - Meditech®
  - Sysloc®
- Flexible needle – 18/20g
  - Angiocath™, Insyte™, Jelco®

Access – Return line
- 18g to 22g
- Steel needles
- Flexible needles

Acute Usage
- Emergent

Chronic Usage
- Adequate Veins
PERIPHERAL IV ACCESS

Advantages

• Short term
• No home care
• Low risk of infection
• Maneuverability

Disadvantages

• Poor veins
• Dehydration
• Scar tissue
• Sclerotic veins
• Excessive weight gain
• Needle phobia
CENTRAL VENOUS ACCESS
Flexible Catheters

**Draw/Return**
- 7 Fr to 13 Fr
- Double lumen
- Quinton™, Arrow®, Medcomp®, Permacath™
- Any dialysis-type catheter

**Silicone or Polyurethane material**

**Acute Usage**
- Short term non-tunneled

**Chronic Usage**
- Long term tunneled cuffed
CENTRAL VENOUS ACCESS
Flexible Catheters

Advantages

• Easy access
• No needle to access
• Better flow rate

Disadvantages

• External line
• Risk infection/thrombus
• Hinders ADL
• Home care
CENTRAL VENOUS ACCESS
Totally Implantable Ports

Draw/Return
• Angiodynamics® Vortex™ port
• 7.5 Fr, 9.6Fr and 11.4Fr
• Single lumen or Double lumen
• Bard Access System port
• Norfolk Medical SportPort™

Acute Usage
• No Indication

Chronic Usage
• Intermittent Therapy
CENTRAL VENOUS ACCESS
Totally Implantable Ports

Advantages
- Totally implanted
- Less risk of infection
- No home care
- Normal ADL

Disadvantages
- Slower Inlet flow rate
- Large gauge non-coring needle to access
- Risk of infection/thrombus
- Location of port
- Hospitalization Usage
CENTRAL VENOUS ACCESS
Flushing And Locking

Flushing – after medication or blood transfusions

- Long term flexible catheter
  - Solution/amount
  - Pulse flush
  - Syringe pressure

Locking – anticoagulant

- Long term flexible Catheter
  - Heparin
  - Sodium Citrate
  - Positive pressure clamping

- Implantable Port
  - Solution/amount
  - Pulse flush
  - Syringe pressure

- Implantable Port
  - Heparin
  - tPA
  - Positive pressure clamping
GUIDELINES FOR CENTRAL VENOUS ACCESS FOR RED CELL EXCHANGE PROCEDURES

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<tr>
<th>Weight (kg)</th>
<th>Acute Access</th>
<th>Chronic Access</th>
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<tbody>
<tr>
<td>10 – 15</td>
<td>7Fr</td>
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<td>16 – 20</td>
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<tr>
<td>21 – 30</td>
<td>9Fr</td>
<td>SL 7.5Fr</td>
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<td>DL 11.4Fr</td>
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<td></td>
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<td>SL 9.6Fr</td>
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<td>&gt;50</td>
<td>11Fr</td>
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NURSING ASPECTS

Central Venous Line Concerns
• Site
  o Acute – Flexible Catheter
  o Chronic – Flexible Catheter, Implantable Port
• Catheter Tip placement
• Port usage

Procedure Concerns – Staff Competency
• Knowledge of Apheresis instrument - troubleshooting
• Competence in PIV/Central Venous Lines
• Citrate toxicity
• Transfusion reaction
• Blood prime
NURSING ASPECTS

Psychosocial Concerns
- External/Internal Central Venous Catheters
- Needle phobia
- Sedation

Patient Education
- Understanding of Procedure/Compliance
- PIV/Central Venous Line
- Home care for Central Venous Line
- Nutrition/Hydration
- Signs/Symptoms of a Transfusion Reaction
- Signs/Symptoms of CVL complication
- Contact information
REFERENCES


Christianson, D. Caring for a Patient Who Has an Implanted Venous Port. American Journal of Nursing 1994, 40-44


Thank You